CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

TENTATIVE ORDER No. R2-2018-00XX
WASTE DISCHARGE REQUIREMENTS AND WATER QUALITY CERTIFICATION for

U.S. FISH AND WILDLIFE SERVICE and the
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
SOUTH BAY SALT POND RESTORATION PROJECT, PHASE 2.

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter called the Water Board or the Board, finds that:

Purpose of the Order

1. The U.S. Fish & Wildlife Service (USFWS) and the California Department of Fish & Wildlife (CDFW), hereafter jointly and independently referred to as the Discharger, are currently regulated by Waste Discharge Requirements (WDRs) Order Nos. R2-2008-0078 (Phase 1) and R2-2012-0078 (Modification 1 to Phase 1). The Discharger has applied for reissuance of WDRs to implement Phase 2 of the South Bay Salt Pond Restoration Project (SBSPRP) by submitting a Report of Waste Discharge/ Application for 401 Certification on March 21, 2017. The Project covered by this Order includes:

   I. New tidal marsh restoration or management of approximately 2,385 acres of former salt ponds referred to as "Phase 2" of the 15,100-acre complex;

   II. Ongoing management of ponds in accordance with the Initial Stewardship Plan (ISP), Phase 1, and Modification 1 to Phase 1, as permitted by Order No. R2-2008-0078 and Order No. R2-2012-0014, which will be rescinded upon adoption of this Order (see Provision E.1); and

   III. Ongoing operation and maintenance.[1]

2. The Project's goal is to restore and enhance native wildlife habitats and wetlands, maintain or improve flood protection, and provide wildlife-oriented public access and recreation. The Project is needed because approximately ninety percent of the original tidal marsh ecosystems around San Francisco Bay have been lost.

3. Under the ISP, the Discharger released low salinity pond waters from former salt ponds to the Bay and operated and maintained ponds while it developed a restoration plan. Order Nos. R2-2008-0078 and R2-2012-0014 covered the first phase of

[1] Operation and Maintenance similar to operation and maintenance of the salt ponds performed by Cargill Inc., under the Certification issued to Cargill, Inc. for Site No. 02-01-C1066 on August 3, 2010 (U.S. Army Corps of Engineers (Corps) Permit No. 2008-00160S).

restoration, which involved 3,270 acres of the 15,100 acres. This Order maintains coverage for the first phase, and also covers the second phase of restoration, which will involve 2,385 acres of the 15,100 acres. Authorizations for future phases will come before this Board for approval. Adaptive management is an important component of the SBSPRP (see Findings 111 -113) and will allow information learned from earlier phases of the SBSPRP to be incorporated into later ones.

4. The future ratio of tidal marsh to managed ponds will be between 50:50 and 90:10. These two endpoints represent the two alternatives that were evaluated for this project under the California Environmental Quality Act (CEQA). The variability between projected ratios of tidal marsh to managed ponds is significant because it is uncertain what percentage of managed ponds is necessary to provide habitat for shorebirds and waterfowl, and whether managed ponds can be reconfigured to protect water quality. The amount of tidal marsh restoration approved under Order Nos. R2-2008-0078 and R2-2012-0014 was 10.5 percent of the 15,100-acre SBSPRP area. This increase remains well below the approved 50 percent endpoint analyzed for the SBSPRP. The amount of tidal marsh restoration approved under this Order will increase tidal marsh from 10.5 percent to 17 percent (2,605 acres) of the 15,100-acre project. This increase remains well below the approved 50 percent endpoint analyzed for the SBSPRP. The above tidal marsh restoration percentages do not include Pond A8 (1,440 acres), which is being operated as reversible muted tidal habitat and may eventually be restored to tidal marsh. Future Phase 2 implementation at Eden Landing could bring the total area of tidal marsh restoration up to 35 percent of the total Project area.

Site Location and Description of entire 15,100-acre SBSPRP

5. The overall 15,100-acre 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, as shown on Figure 1. The SBSPRP will be implemented in a number of phases taking place over approximately several decades.

Discharger

6. USFWS owns and manages the 8,000-acre Alviso pond complex and the 1,600-acre Ravenswood pond complex, and CDFW owns and manages the 5,500-acre Eden Landing pond complex. The Alviso pond complex consists of 25 ponds on the shores of the South Bay in the towns of Fremont, San Jose, Sunnyvale and Mountain View, within Santa Clara and Alameda Counties. The Ravenswood pond complex consists of seven ponds on the bay side of the San Mateo Peninsula. The Eden Landing pond complex consists of 23 ponds on the shores of the East Bay, west of Hayward and Union City in Alameda County. Each agency is responsible for the acreage it owns and not that of the other agency.

Regulatory Background of the SBSPRP

7. In 2003, the Discharger purchased 15,100 acres of salt ponds in South San Francisco Bay from Cargill Incorporated. In 2004, this Board issued WDRs Order No. R2-2004-0018 to the Discharger to release low salinity waters from these ponds to waters of the State in order to prepare them for future restoration. As part of those WDRs, the Discharger developed an ISP to operate and maintain ponds within the Alviso, Ravenswood, and Eden Landing complexes before restoration. The ISP indicated that planning and design for long-term restoration would take about five years, and that additional time would be required for implementation. Objectives of the ISP include: (a) cease commercial salt operations, (b) introduce tidal hydrology, (c) maintain existing wildlife habitat, (d) facilitate long-term restoration, (e) minimize management costs, and (f) meet water quality standards.

   In 2008, Order No. R2-2008-0078 was adopted to authorize Phase 1 of SBSPRP. Order No. R2-2012-0014 was adopted in 2012 to implement Modification 1 to Phase 1 of the SBSPRP. Phase 1 actions included: restoring tidal marsh habitat in Ponds A6, A17, E8A, E9, and E8X; introducing muted tidal habitat to Pond A8; and reconfiguring managed Ponds A16 and SF2.

8. This Order is organized into four sections: Phase 2 Marsh Restoration and Pond Management; Phase 1 Marsh Restoration and Pond Management; Management of Ponds under the Initial Stewardship Plan (ISP); and Ongoing Operation and Maintenance. The Findings are followed by Prohibitions, Specifications, Receiving Water Limitations, and Provisions.

9. Attachments to the Order include Figures, Supplemental Tables, the Adaptive Management Plan (AMP) (See Attachment C and Findings 111 - 113), the Water Quality Self-Monitoring Plan, the Landscape and Habitat Monitoring Plan, and Standard Provisions and Reporting Requirements. Many of the monitoring efforts outlined in the Landscape and Habitat Monitoring Plan were specific to Phase 1 and have been completed. Monitoring efforts in the Attachments that will be implemented in Phase 2 are summarized below.

   Attachment D, Water Quality Self-Monitoring Program: Monitoring is currently performed for salinity from June through November on a weekly basis at the discharges from Ponds A5, A7, A8, A14, A16, A2W, A3W, and SF2. In Phase 2, the discharges from these ponds will continue to be monitored and the discharge from Pond R5/S5 will also be monitored.

   Attachment E, (Draft) Landscape, Habitat, and Biological Species Monitoring Plan: Monitoring continues for various biological species. Western Snowy Plovers, Ridgway's Rails, and salt marsh harvest mice are monitored in areas of the SBSPRP footprint on an annual basis. *Spartina* continues to be mapped across the SBSPRP area on an annual basis. Studies of mercury in fish and birds and of environmental mercury have continued throughout the SBSPRP in association with project activities at Pond A8.

By September 30, 2018, this Order requires the Discharger to prepare addenda to Attachment C, *Adaptive Management Plan*, Attachment D, *Water Quality Self-Monitoring Program*, and Attachment E, *(Draft) Landscape, Habitat, and Biological Species Monitoring Plan*. The addendum to each Attachment shall contain the following information:

- A list of monitoring activities that were unique to Phase 1 and will not be implemented in Phase 2.
- The names and completion dates of monitoring reports completed in Phase 1 in response to requirements in Attachments C, D, and E, along with web addresses at which those reports are available or electronic copies of the reports.
- A list of the monitoring activities described in Attachments C, D, and E that will be implemented in Phase 2.

I. Phase 2 Marsh Restoration & Pond Management

Site Location & Description of Phase 2 Activities of the SBSPRP

10. Phase 2 of the South Bay Salt Pond Restoration Project (SBSPRP) is a collaborative effort among federal, state, and local agencies working with scientists and the public to develop and implement project-level plans and designs for habitat restoration, flood management, and wildlife-oriented public access within portions of the former Cargill salt ponds in South San Francisco Bay (Bay). The former salt ponds covered in Phase 2 are part of the USFWS-owned and managed Don Edwards San Francisco Bay National Wildlife Refuge (Refuge), and cover approximately 9,600 acres in the South Bay. The Refuge ponds in Phase 2 are collectively about 2,385 acres in size. The proposed Phase 2 actions will restore a mosaic of habitats, including tidal brackish and salt marsh, tidal mudflat, salt panne, subtidal flats and channels, sloughs, ponds, marsh ecotones, upland transition zones, and open water habitats (managed ponds), to support populations of fish and wildlife, special-status species, migratory waterfowl, shorebirds, and anadromous and resident fishes. After implementation of actions authorized by this Order, Phase 2 target habitats in Ponds A1, A2W, and R4 are expected to develop over 50 years, but may take longer. Phase 2 of the SBSPRP includes activities that were not components of the ISP or Phase 1: the construction of broad habitat transition zones (also referred to as ecotones) between some ponds and levees and the enhancement of existing levees to replace flood management services that will be lost as the result of Project related levee breaching. Both of these activities require fill of waters of the State in quantities much larger than the amount of fill authorized for the ISP or Phase 1. Most of this fill will be associated with creating habitat transition zones and with enhancing landward levees for flood management.

11. The creation of habitat transition zones, which are low lying riparian areas that separate wetlands from uplands, is an especially important element of this project. Habitat transition zones between marshes and uplands are locally scarce and provide habitat that is essential to sustaining five endangered species: two endangered animals, Ridgway's rail (*Rallus longirostris obsoletus*) and salt marsh harvest mouse

(*Reithrodontomys raviventris*), and three endangered plants, *Cirsium hydrophilum* var. *hydrophilum* (Suisun thistle), *Chloropyron molle* ssp. *molle* (soft bird's-beak), and *Suaeda californica* (California sea-blite). Breaching of bayside levees, which is essential to restoring tidal wetlands in the former salt ponds, would not be allowed if communities adjacent to the former salt ponds were not provided with replacement flood management. In addition, the habitat transition zones will provide habitat resiliency to sea level rise and, over time, portions of the habitat transition zones that will be uplands immediately after ecotone creation will eventually convert to tidal marshes. Creation of habitat transition zones in Phase 2 of the SBSPRP will require the placement of fill in 81.1 acres of waters of the State. However, at the time of transition zone construction, 75.9 acres of that fill area will be below the High Tide Line (HTL). Therefore, this 75.9 acres of transition zone fill will still be regulated as waters of the State at the time of transition zone construction. Only 5.2 acres of fill will change waters of the State into uplands, and, as sea levels rise, this 5.2-acre area will be converted to waters of the State. In light of the significant benefit to listed species habitat associated with the creation of habitat transition zones, this amount of fill will not have a significant negative impact on waters of the State in the footprint of the SBSPRP. In addition, this amount of fill is essential to tidal marsh restoration, since some of the habitat transition zones will also replace the flood protection for near shore communities that is currently provided by the outer levees of the salt ponds.

12. SBSPRP Phase 2 will modify ponds in the 8,000-acre Alviso pond complex and the 1,600-acre Ravenswood pond complex, both of which are owned and managed by USFWS as part of the Refuge (see Figures 2a through 2d). Within these two pond complexes, there are four groups of ponds (or "pond clusters") that are included in the proposed Phase 2 actions; these are illustrated in Figures 3 through 6. They are as follows:

    - Alviso–Island Ponds (Island Ponds) shown in Figure 3 in the Alviso pond complex
    - Alviso–A8 Ponds (A8 Ponds) shown in Figure 4 in the Alviso pond complex
    - Alviso–Mountain View Ponds (Mountain View Ponds) shown in Figure 5 in the Alviso pond complex
    - Ravenswood Ponds, shown in Figure 6 in the Ravenswood pond complex

    The Alviso pond complex consists of 25 ponds on the shores of the South Bay in the cities of Fremont, San Jose, Sunnyvale, and Mountain View, within Santa Clara and Alameda Counties. The pond complex is bordered on the west by the Palo Alto Baylands Park and Nature Preserve and the City of Mountain View's Charleston Slough; on the south by commercial and industrial land uses, Mountain View's Shoreline Park, the National Aeronautics and Space Administration Ames Research Center, and Sunnyvale Baylands Park; and on the east by Coyote Creek in San Jose and Cushing Parkway in Fremont. The Phase 2 project actions in the Alviso pond complex focus on three clusters of ponds.

    The first cluster, the Island Ponds, containing Ponds A19, A20, and A21 is between Coyote Creek and Mud Slough near the eastern end of the Alviso pond complex. The

Island Ponds were breached in 2006 as part of tidal marsh restoration actions covered by the ISP.

The second cluster is the A8 Ponds. Work would be completed in Ponds A8 and A8S in the southern and central portion of the Alviso pond complex. The A8 Ponds are west of the town of Alviso, north of Sunnyvale and State Route (SR) 237, and east of other parts of the Alviso pond complex. Ponds A8 and A8S were also included in the Phase 1 work; they were made reversibly tidal through the installation of a variable-size and reversible "notched" gate that opened in July 2010. Ponds A5 and A7 were also connected to Pond A8 and Pond A8S as part of Phase 1 actions. There will be no Phase 2 actions at Ponds A5 and A7.

The third cluster, the Mountain View Ponds, containing Ponds A1 and A2W, is on the western edge of the Alviso pond complex. The City of Mountain View lies immediately to the south, and the Charleston Slough and the Palo Alto Flood Control Basin lie to the west.

The Ravenswood pond complex consists of seven ponds on the Bay side of the Peninsula, both north and south of SR 84, west of the Dumbarton Bridge, and on the Bay side of the developed areas of the City of Menlo Park in San Mateo County. Bayfront Park in Menlo Park is directly west of the Ravenswood pond complex, and SR 84 is along its southern border. The Phase 2 project actions in the Ravenswood pond complex are focused on the western half of the pond complex, which contains Ponds R3, R4, R5, and S5, here referred to as the Ravenswood Ponds.

Construction activities to be performed in Phase 2 are summarized in Table 4 in Attachment B.

13. At a broad scale across the project activities, the project will affect open waters and wetlands in the Coyote Watershed (Hydrological Unit Code - 8: 1805003), and San Francisco Bay (Hydrological Unit Code -8: 18050004). The United States Geologic Survey 8-digit Hydrological Unit Code and the San Francisco Bay Basin Plan Surface Water Plan Area for each complex/cluster are provided in Table 1 and depicted in Figure 7 in Attachment A. Table 1 also includes the latitude/longitude (in decimal degrees) of the centroid point of each pond.

Table 1. Other Location Descriptions: Watershed, Surface Water Plan Area, and Latitude/Longitude

POND CLUSTER	POND	WATERSHED NAME (HUC 8)	*AREA (ACRES)	BASIN PLAN SURFACE WATER PLAN AREA AFFECTED	LATITUDE	LONGITUDE
ALVISO-ISLAND PONDS	A19	Coyote Watershed (1805003)	265	Santa Clara Basin	37.467092	-121.957692
	A20		65		37.464876	-121.970986
	A21		150		37.465142	-121.979427
ALVISO-A8 PONDS	A8	Coyote Watershed (1805003)	410	Santa Clara Basin	37.428778	-121.991558
	A8S		160		37.420860	-121.989553
ALVISO MOUNTAIN VIEW PONDS	A1	Coyote Watershed (1805003)	275	Santa Clara Basin	37.442525	-122.086577
	A2W		435		37.441989	-122.074607
RAVENSWOOD PONDS	R3	San Francisco Bay (18050004)	270	South Bay Basin (Lower Bay)	37.486675	-122.155291
	R4		295		37.493048	-122.161933
	R5		30		37.488054	-122.170371
	S5		30		37.485913	-122.170712
Note: *Pond areas excerpted from the 2007 SBSP FEIS/R AECOM 2016						

14. Adjacent water bodies and ponds affected by Phase 2 actions are summarized in Table 2.

Table 2. Name of Affected Waterbody and City/County of Ponds

Complex	Cluster	Affected Named Bodies of Water	City Location	County Location
Alviso	Island Ponds (A19, A20, A21)	San Francisco Bay, Salt Ponds, Mud Slough, Coyote Creek	Fremont	Alameda
Alviso	A8 Ponds (A8, A8S)	San Francisco Bay, Salt Ponds, Alviso Slough/ Guadalupe River, Guadalupe Slough	Sunnyvale	Santa Clara
Alviso	Mountain View Ponds (A1, A2W)	San Francisco Bay, Salt Ponds, Charleston Slough, Mountain View Slough/Permanente Creek, Whisman Slough/Stevens Creek	Mountain View	Santa Clara
Ravens-wood	Ravenswood Ponds (R3, R4, R5, S5)	San Francisco Bay, Salt Ponds, Flood Slough, Ravenswood Slough, San Francisco Creek, West Point Slough, All-American Canal	Menlo Park	San Mateo

Benefits of Wetland Restoration

15. The Project will make a large and valuable contribution to tidal wetland restoration in the San Francisco Bay region, which was recommended by the *Baylands Ecosystem Habitat Goals Report* (1999) and the *Comprehensive Conservation and Management Plan* (1993; updated 2007); both studies encouraged the return of salt ponds to tidal marsh where feasible. Habitat Goals Chapter 5 contains goals for the South Bay Subregion of San Francisco Bay states:

> The overall goal in the South Bay subregion is to restore large areas of tidal marsh connected by wide corridors of similar habitat along the perimeter of the Bay. Several large complexes of salt ponds, managed to optimize shorebird and waterfowl habitat functions, should be interspersed throughout the subregion, and naturalistic, unmanaged salt ponds (facsimiles of historical, hypersaline backshore pans) should be restored on the San Leandro

> shoreline. ***There should be natural transitions from mudflat through tidal marsh to adjacent uplands*** **[*emphasis added*]**, wherever possible. Adjacent moist grasslands, particularly those with vernal pools, should be protected and improved for wildlife. Riparian vegetation and willow groves should be protected and restored wherever possible

The unique characteristics of the restoration opportunities in Phase 2 of the SBSPRP justify a focus on listed species that depend on tidal marshes. Both the Habitat Goals and the *USFWS Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Recovery Plan) (USFWS, August 27, 2013), which include recovery actions for the California Ridgway's rail (formerly California Clapper Rail) and salt marsh harvest mouse (SMHM), support both the restoration of as many acres of tidal marsh as feasible and the creation of habitat transition zones (i.e., ecotones) between marsh habitats and upland high water refuges.

Habitat transition zones also provide a gentle slope for dissipation of wave energy and reduction of erosion potential, thereby protecting the closed landfill below Shoreline Park at Ponds A1 and A2 and the closed landfill south of Pond A8S. The benefits of habitat transition zones include the establishment of habitat complexity and diversity, erosion protection for the landfill and adjacent levees, and preparation for long-term sea-level rise adaptation. Fill placed to build transition zones below HTL tidal elevation would convert ponds to tidal wetlands, but fill placed above that elevation would convert waters to uplands. Estimated quantities of fill are provided in Table 4.

16. 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 edge habitat, and minimize non-native vegetation (if appropriate management efforts are taken to control non-native species). Marsh systems that are tidally connected to the estuary improve water quality by filtering and fixing pollutants, in addition to protecting beneficial uses by providing the following: nursery habitat and protection from predation for native fish species, significant biological productivity to the estuarine system, and habitat for rare and endangered species such as the salt marsh harvest mouse (*Reithrodontomys raviventris*) and the Ridgway's rail (*Rallus longirostris obsoletus*). Successful SBSPRP restoration would also provide shallow-water habitat for migrating shorebirds and foraging and nesting islands for birds such as Forster's terns, American avocets, Caspian terns, black-necked stilts and snowy plovers. In addition to habitat and water quality benefits, tidal marsh restoration will also help protect communities from floods, storms, and sea level rise.

17. Public access and recreation elements are an important component of the overall restoration strategy. These elements help to educate the public, achieve regional public access and recreation goals (e.g., the Bay Trail), and to build public support for future phases of restoration. The project goals of habitat creation and public access are being carefully balanced, and an adaptive management approach is being implemented, to ensure that public access does not significantly affect the habitat goals of the project.

18. The SBSPRP area can be divided into four general habitat types (tidal habitat, reversible muted tidal habitat, managed pond, and reconfigured managed pond) covering a total of 15,100 acres. The habitat types in Table 3 present the resulting acres of each habitat type after implementation of the proposed Phase 2 actions in 2,385 acres of salt ponds. The net benefit is an increase in tidal marsh, muted tidal, and reconfigured managed pond habitats, and a corresponding decrease in salt ponds. The Phase 2 restoration actions will provide approximately 1,005 acres of tidal habitat (not including the 480 acres of tidal marsh restored at the Island Ponds, approved under Order No. R2-2004-0018), plus about 1,440 acres of reversible muted tidal habitat in Ponds A5, A7, A8, and A8S, and 330 acres of reconfigured managed ponds.

Table 3. Proposed Habitat Changes to be Implemented in Phase 2

Pond	Existing Habitat Type	Anticipated Start of Construction	Type of Restoration	Acres	Anticipated Construction Completion
Alviso Pond Complex (USFWS)					
A1	Managed Pond	2019	Tidal habitat	275	2021
A2W	Managed Pond	2019	Tidal habitat	435	2021
A19[1]	Tidal Habitat	2019	Tidal habitat enhancements	65	2020
A20	Tidal Habitat	2019	Tidal habitat enhancements	265	2020
A8S[2]	Managed Pond	2018	Enhancements to previously reconfigured managed ponds	160	2019
Ravenswood Pond Complex (USFWS)					
R3	Managed Pond	Fall 2018	Reconfigured managed pond	270	2021
R4	Managed Pond	Fall 2018	Tidal habitat	295	2021
R5	Managed Pond	Fall 2018	Reconfigured managed pond	30	2021
S5	Managed Pond	Fall 2018	Reconfigured managed pond	30	2021

Table 3. Proposed Habitat Changes to be Implemented in Phase 2

Pond	Existing Habitat Type	Anticipated Start of Construction	Type of Restoration	Acres	Anticipated Construction Completion
Eden Landing Pond Complex (CDFW) The Phase 2 action at Eden Landing is still pending CEQA/NEPA selection of a preferred alternative. The dates for the "Bay Ponds" (E1, E2, E4, E7) are still uncertain, and the full restoration of the other groups of ponds has not been determined at this time.					
Total Acreage				1,825	2021

1 In previous documents in the SBSP Restoration Project, Ponds A19, A20, and A21 were treated together as a group referred to as "the Island Ponds." That terminology has persisted in the Phase 2 documents, including the request for a 401 Water Quality Certification, largely because the Phase 2 CEQA/NEPA document's range of alternatives for a Phase 2 action at the Island Ponds includes all three of these ponds, even though the selected alternative to move forward into design and permitting included only Ponds A19 and A20. The acreage of Pond A21 is 150 acres, and it will remain on its trajectory to tidal habitat establishment.

2 The Phase 2 action at the A8 Ponds only includes a direct action (construction of habitat transition zones) in Pond A8S, which is why the table listed above only lists that pond. However, the Phase 1 action hydraulically connected Ponds A8, and A8S. Their combined acreage is 570 acres.

Note: The Phase 2 actions at Ravenswood include a trail section to complete a loop trail around Ponds R5 and S5 with connections to existing trails in Bedwell Bayfront Park and to the Bay Trail spine adjacent to State Route 84. Phase 2 also includes a viewing platform near the midpoint of that new trail segment. The Phase 2 actions at the Alviso pond complex include several new trails and viewing platforms at the Alviso-Mountain View Ponds (A1 and A2W) as well as enhancements or preservation or reconstruction of existing public access facilities. No new public access or recreational facilities are proposed as the Island Ponds (A19 and A20) or the A8 Ponds as part of Phase 2.

Current Regulatory Status of Wetlands in the SBSPRP

19. *Existing wetlands.* Existing wetlands and other waters of the State will be impacted by Phase 2 dredge and fill activities. Table 4 below summarizes the Phase 2 impacts to existing wetlands and other waters in the four Phase 2 action areas (See Tables 5 through 8 in Attachment B for summaries of dredge and fill volumes in Phase 2). Phase 2 actions will convert about 14.1 acres of wetlands and other waters to uplands. No compensatory mitigation is required for impacts to existing wetlands and waters of the State, since this restoration project will result in many more acres of restored and enhanced habitats than the acres of habitat that are impacted, and the restoration will create about 81.1 acres of regionally rare habitat transition zones (See Finding 11).

Table 4. Summary of Dredge and Fill Information for Phase 2 of the SBSPRP

Pond System	Dredge Area (Acres)	Dredge Area Below HTL (Acres)	Net Gain In Waters Below HTL (Acres)	Fill Area (Acres)	Fill Areas Below HTL (Acres)	Net Fill Above HTL (Acres)	Net Conversion of Waters to Uplands (Acres)
A19/A20	6.4	2.4	4.0	6.6	6.6	0.0	-4
A8 Ponds	0	0	0.0	24.6	23.9	0.7	0.7
Mountain View Ponds	2.2	1.3	0.9	52.8	46.4	6.4	5.5
Ravenswood Ponds	10.4	8.2	2.2	41.9	27.8	14.1	11.9
Total	19	11.9	7.1	125.9	104.7	21.2	14.1

Note: HTL is the high tide line. The net gain in waters below HTL is the net change in uplands (areas above HTL) to waters (areas below HTL). The net fill above HTL is the net change in bed elevation of waters to an elevation above HTL. The net conversion of waters to uplands is the net increase in the acres of ponds with bottom elevations raised above HTL.

20. The U.S. Army Corps of Engineers (Corps), as the federal regulatory agency implementing the Clean Water Act (CWA), is expected to issue a CWA Section 404 permit after the Water Board has adopted this combined WDR/CWA 401 Certification. The Corps initiated an Endangered Species Act, Section 7 consultation with USFWS and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS). Biological Opinions and respective amendments from both agencies have been issued (USFWS Reference No. 08FBDT00-2017-F-0109-2, November 21, 2017; NMFS Reference No. [TBD]) and with the implementation of the Terms and Conditions and the Reasonable and Prudent Measures, the Project will not jeopardize the continued existence of species listed under the federal Endangered Species Act.

21. The San Francisco Bay Conservation and Development Commission (BCDC), a state regulatory agency, is responsible for issuing a consistency determination (CD) and a permit to the Discharger. The CD is for actions on federal lands, and the permit is for actions on lands owned by the State. BCDC also has an active role in the planning and design of the Project. One element of BCDC's CD/permit addresses public access via the Bay Trail. BCDC has approved Phase 1 of the Project and Modification 1 to Phase 1 of the Project, and is expected to take an action on Phase 2 of the Project after adoption of this Order.

Related Studies and Projects in South San Francisco Bay

22. Since the mid-1990s, many projects and studies have been conducted to support the SBSPRP, including its Phase 1 activities (see http://www.southbayrestoration.org/Documents.html).

23. The SBSPRP partners are also coordinating with several other restoration or environmental projects in the South Bay, including the Corps' South San Francisco Bay Shoreline Study, the San Francisco Estuary Invasive Spartina Project, the Eden Landing Ecological Reserve Restoration Project, the Lower Guadalupe River Flood Protection Project, the Alviso Slough Restoration Project, and the Bair Island Restoration Project.

General Phase 2 Construction Activities

24. Restoring former salt ponds to tidal marsh habitat, re-configuring ponds for wildlife habitat, and providing recreational facilities will involve the following construction activities:

    Tidal Restoration. Construction activities involved in the proposed tidal habitat restoration include the following. These activities apply only to ponds where restoration is actively occurring:

    - Breach sections of outboard levees.
    - Lower sections of outboard levees.
    - Breach internal levees.
    - Lower sections of internal levees.
    - Excavate pilot channels to sloughs through the fringe marsh outboard of outboard levee breaches or dredge lock access to allow for marine access.
    - Construct ditch blocks in the perimeter and internal borrow ditches with material excavated from the levee breaches and lowered levees, or from other clean sediment.
    - Import sediment (according to Specifications B.1 and B.2).
    - Side-cast of dredge spoils into adjacent marsh.
    - Excavate portions of outboard sloughs, if necessary to enlarge the channel and obtain borrow ditch block material.
    - Construct marsh ponds/pannes by constructing shallow depressions in pond bottoms prior to restoration of tidal action, or along the tops of lowered internal levees.
    - Remove or abandon existing water control structures.
    - Reconfigure culvert connections.
    - Break up gypsum layer in some pond bottoms by mechanical means (Note: In Phase 2, the only break up of gypsum layers will occur in Pond R4. Channel

excavation will break up the gypsum layer in the footprint of the excavated channels).

- Construct access bridges over levee breaches and armor the sides of breaches under the bridges.

Managed Ponds. Construction activities involved in reconfiguring managed ponds include the following:

- Install, replace, or modify intake/outlet water control structures with tide gates.
- Install fish screens on outboard intake/outlet water control structures as appropriate.
- Construct low berms to divide a given pond into multiple cells.
- Lower internal levees to combine ponds.
- Install water control structures, such as flashboard weirs, in internal berms to regulate flow among cells. Installation of water control structures will most likely require the construction of cofferdams using sheet piles on the internal side of the levee to dewater the construction area, as needed.
- Construct intake and outlet canals to convey water among individual cells.
- Construct internal islands for nesting, roosting, and foraging using fill material excavated from the windward side of the islands.
- Grade pond bottoms to achieve desired grades and elevations.
- Improve, raise, and extend levees between managed ponds and existing or restored marshes as necessary to prevent tidal inundation of managed ponds.
- Install or operate pumps as necessary.
- Excavate pilot channels to the Bay through the fringe marsh outboard of new water control structures to allow for marine access.
- Improve levees around ponds to improve maintenance access.

Habitat Transition Zone (Ecotone) Construction. Habitat transition zones will be constructed inside selected ponds to create transitional habitat between the lower elevation of the pond bottoms and the uplands and levees behind them. Construction activities involved in Habitat Transition Zones include the following:

- The habitat transition zones will be constructed of fill material from upland construction projects and will extend into the center of the pond at a typical slope of 30:1 (h:v).
- Material will be placed and compacted to approximately 70 percent density to enable vegetation establishment.
- The tops of the habitat transition zones will be constructed to about 9 feet elevation North American Vertical Datum (NAVD88)

- Slope protection will be maintained by establishment of native vegetation.

PG&E Tower Work. Conversion of Pond A2W to tidal marsh habitat requires PG&E to upgrade the tower foundations of 16 transmission towers in response to the introduced tidal flux and to raise the maintenance/service boardwalks that run under the power lines and provide PG&E access to the towers.

- Cofferdams will be constructed around each foundation at low tide and then dewatered.
- Water pumped from within cofferdams will be managed in accordance with the 2007 SBSP Final Program EIS/R Mitigation Measure 3.4-5a.
- Concrete will be poured into forms within the dewatered cofferdams.
- Temporary structures will be removed once construction is complete
- Existing boardwalks will be raised a maximum of 4 feet, using the existing boardwalk pillars.

Recreational Elements. Construction activities involved in installing or upgrading public access and recreation elements include the following:

- Upgrade the existing Bay Trail.
- Construct viewing platforms and interpretive stations.
- Upgrade the portions of trails that follow existing levees to provide a minimum width of 6 to 8 feet (ft) of compacted earth and allow multi-use, excluding equestrians.
- Construct interpretive stations that include elements such as a view portal, educational symbols, and storyboarding. They will be constructed of a combination of wood and steel and will be sized based on the site location.
- In Phase 1, a kayak/boat launch was constructed approximately to accommodate non-motorized small boats (e.g., kayaks and canoes) and small motorized craft for use in hunting. No new kayak/boat launches are proposed in Phase 2.
- Install Americans with Disabilities Act (ADA)-compliant features for all trails as soon as possible. Phase 1 action ADA-compliant features include the trail to the Oliver Salt Works interpretative area, the A16 viewing platform, the A17 fishing platform, and all Ravenswood area recreational features. ADA-compliant features constructed in Phase 2 will include a trail and viewing platforms on the west levee of Pond A1, a trail and viewing platform on the eastern levee of Pond A2W, and a trail on the eastern border of Ponds R5 and S5.

25. **Sources of Material – Sources of fill for Phase 2** will include material excavated from on-site breaches, borrow ditches, and levees. Fill material that is imported to any of the SBSPRP sites, consisting of either dredged sediments or upland soil, shall be determined to be acceptable for use in the SBSPRP based on criteria approved by Water Board staff, per Specifications B.1 and B.2 and Provisions E.40 and E.41.

Specific Phase 2 Activities

26. General descriptions of each of the planned pond habitats are provided below. Specific Phase 2 construction activities for each pond are summarized in Table 4 in Attachment B. Phase 2 actions will increase habitat connectivity, increase tidal flow, expedite the transition of the Island Ponds to tidal marsh, and create habitat transition zones.

27. At the Island Ponds (Ponds A19, A20, and A21 in the Alviso pond complex), the majority of the two internal levees, including the western levee of Pond A19 and the eastern levee of Pond A20, will be removed. The levees will be excavated to match the elevation of the surrounding marsh that exists between the two ponds, at MHHW elevation (approximately 7 feet NAVD88). Removing most of the levees between Ponds A19 and A20 will improve habitat connectivity by connecting the two former ponds. Sections of these two levees will be left at their existing elevations to provide high-tide refugia for birds and other wildlife species. Widening of the existing western breach along Pond A19's southern levee will improve the circulation and flow of sediment into the pond, speed the breakdown of the remaining levee, and increase the rate of transition to marsh habitat. Following breach widening, the breach will have a bottom width of approximately 150 feet, an invert elevation near 3.5 feet NAVD88 and 3:1 (horizontal to vertical [h:v]) side slopes. The length of the cut will be about 90 feet. Two new breaches will be made in the levee on the north side of Pond A19 to improve habitat connectivity between the Island Ponds and Mud Slough, and also to improve the distribution of sediment to the ponds. Both breaches will be roughly 50 feet wide at the bottom with an invert elevation of 3.5 feet NAVD88 with 3:1 (h:v) side slopes. The length of channels cut to connect Pond A19 with Mud Slough through the levees will be about 150 feet at the Pond A19 northwest breach and about 90 feet at the Pond A19 northeast breach. Phase 2 operations will build about 6 ditch blocks in Pond A19. Ditch blocks will be established in the existing borrow ditches to direct tidal flows into the interior of the ponds. The material for the ditch blocks will be sourced on-site from levee lowering or levee breaches.

28. ***Alviso System A2W***. Ponds A1 and A2W will be modified by Phase 2 actions. Pond A1 receives water at its northwesterly end from Charleston Slough via an existing 60-inch gate intake structure. From Pond A1, a 72-inch siphon that runs under Mountain View Slough transfers water to A2W. The outlet from pond A2W discharges pond water at its northerly end to the Bay through a 48-inch gate structure (Discharge Point AA2W-1). The ponds themselves are somewhat subsided and have water depths of approximately 2 to 4 feet above pond bottom elevations that are at approximately 0-1 feet elevation NAVD88. Pond A1 will be breached at two Locations and Pond A2W will be breached at four locations. The two Pond A1 breaches will be at the northwest corner of the pond, on the western levee, and along the eastern levee into Permanente Creek/Mountain View Slough. Two of the four Pond A2W breaches will be on the western levee into Permanente Creek/Mountain View Slough. The other two breaches will be on the eastern levee into Stevens Creek/Whisman Slough. Breach locations will generally follow the locations of historical slough traces. The breaches will have an invert elevation of about 2 feet NAVD88 and have about 2:1 (h:v) side slopes.

Bottom widths will be about 60 feet. The length of the channel cut connecting Pond A1 to adjacent Mountain View Slough will be about 110 feet long. At Pond A2W's western levee, the channel cut through the south breach connecting Pond A2W to Permanente Creek/Mountain View Slough will be about 230 feet long and the channel cut through the north breach will be about 200 feet long. On Pond A2W's east levee, the channel cut through the south breach connecting A2W to Stevens Creek/Whisman Slough will be about 210 feet long and through the north breach the channel cut will be about 200 feet long. Both of the breaches on the eastern side of Pond A2W will be armored on both sides to protect bridge abutments from future erosion or scour.

29. Phase 2 levee breaches in Pond A1 will remove some of the de facto flood protection currently provided by the outboard levees of Pond A1. Most of the western levee of Pond A1 will be raised to offset that loss and maintain current levels of flood risk management in the communities and infrastructure to the southwest of Pond A1. Much of the material for raising the levee will come from off-site, upland sources, but some material may come from on-site breaching. About 4,400 feet of the levee will be raised. The improved levee will have a 12-foot wide crest north of the proposed viewing platform, where no trail would be present, and a 14-foot wide crest from the viewing platform southward, where a trail will be added. Levee side slopes will be 3.5:1 (h:v). The crest of the levee north of a new viewing platform will be constructed to an elevation of 11 feet NAVD88. The crest of the Pond A1 western levee at the viewing platform and southward will be raised to an elevation of approximately 14.7 feet NAVD88, to match that of the raised Coast Casey Forebay levee that it connects to on its southern terminus. Only the south portion of the A1 west levee has proposed public access that will need to be improved and built to an elevation that matches the public access trail at the Coast Casey levee. The target elevation for the A1 West levee is 11 feet NAVD88, to match the existing level of flood protection.

30. To offset the loss of de facto protection provided by Pond A1, the Coast Casey Forebay levee that is along the western end of the southern border of Pond A1 will be improved between the Palo Alto Flood Control Basin levee and the high ground in Shoreline Park. The City of Mountain View, which owns that levee, will raise the entire length of that levee even beyond its intersection with the Pond A1 levee. To incorporate the highest sea-level rise prediction from the City of Mountain View's Sea Level Rise Study, Feasibility Report, and Capital Improvement Program, this levee improvement will build a levee base and foundation support sufficient to support a 16- foot NAVD88 cross section to a crest elevation of 14.7 feet NAVD88. This design levee height satisfies the FEMA design criteria for 100-year flood level plus 3 feet and gives the City of Mountain View the option of future improvements to address sea-level rise. This design levee height would also improve flood risk management along the southern end of Charleston Slough and the communities and infrastructure behind it. Levee improvements will be about 1,440 feet long. The top width of the improved levee will be about 24 feet. The existing wooden platform and viewing station that extend into the slough from the trail near the water intake will remain in place, and an Americans with Disabilities Act (ADA) compliant sloped path would be installed to

connect it to the raised Coast Casey Forebay levee. A similar path will connect the top of the Coast Casey Forebay levee to the existing trail from the parking area to the south.

31. To provide access to existing PG&E utilities, two single-span precast/prestressed I-girder bridges will be installed to extend over the armored breaches on the eastern levee of Pond A2W. The bridges will consist of pile supported abutments and wing walls at each end. Foundations and wing walls will be cast in place concrete footings supported on top of piles driven into the existing levee and its edges. The total pile count for both bridges is estimated to be 32 piles. The superstructure will be a cast-in-place concrete bridge deck on precast/prestressed 2.5-foot deep I-girders. Each bridge will be about 60 feet long and 19 feet wide. This length allows for a minimum of a 40 foot channel bottom width through the bridge opening.

32. About 3,700 linear feet and 3,200 linear feet of transition zones will be established along the inside slopes of Ponds A1 and A2W, respectively. The transition zone in Pond A1 will extend all the way across the southern border of the pond. In Pond A2W the transition zone will only cross the central portion of the pond's southern border, so that potential future connections with the existing mitigation marshes to the south (the Mountain View mitigation marsh and the Stevens Creek mitigation marsh) are not precluded. The habitat transition zones will have a top elevation of approximately 9 feet NAVD88. The slope of these features in Pond A1 would be varied to provide a range of different slopes including slopes at 10:1, 20:1, 30:1 and 40:1 (h:v). In Pond A2W, the slope will be approximately 30:1 (h:v).

33. Nesting and roosting habitat for shorebirds, terns, and dabbling ducks will be created by constructing up to 10 islands in Ponds A1 and A2W. The islands will be constructed largely of upland fill material from off-site projects. Each island will have a top area of about 10,100 square feet, a top elevation of 12.5 feet NAVD88) and side slopes will be about 3:1 (h:v).

34. **PG&E Tower Work**. Conversion of Pond A2W to tidal marsh habitat requires PG&E to upgrade the tower foundations of 16 transmission towers to account for the introduced tidal flux and to raise the maintenance/service boardwalks that run under the power lines and provide PG&E access to the towers. The concrete pedestals on which the towers sit will be reinforced with additional concrete placed higher on the tower legs to protect the metal portions of the towers from the corrosive action of saltwater. Cofferdams will be constructed around each foundation at low tide and then dewatered. Concrete will be poured into forms within the dewatered cofferdams and all temporary structures will be removed once construction is complete. During cofferdam dewatering, pumped water will be managed in accordance with the 2007 SBSP Final Program EIS/R Mitigation Measure 3.4-5a. Existing PG&E access boardwalks in Pond A2W will be elevated and a new section of boardwalk will be constructed outside of Pond A1 to connect Pond A2W's outboard levee with an existing boardwalk outside of the Palo Alto Flood Control Basin. The additional boardwalk would be about 2,350 feet long and 3 feet wide (7,050 square feet or 0.16 acre). This area will be new shade over to the Bay. Existing boardwalks will be raised a maximum of 4 feet, using the existing boardwalk pillars. Existing boardwalks in Pond A2W are made of wooden

planks on a wooden frame that rests on concrete foundations set into the pond bottom. The decking is approximately 6,700 feet long and two to three feet wide. This boardwalk will be removed and replaced with a higher one to retain PG&E access to the towers. The replacement would increase the width of the boardwalk by approximately two feet and thus increase the shaded area of the Bay. The exact amount of added surface area will not exceed 13,500 square feet (about 0.3 acre).

35. ***Alviso System A7***. This system consists of Ponds A5, A7, A8, and A8S. During Phase 1 Actions, Ponds A8 and A8S were made reversibly tidal through the installation of a variable-size and reversible "notched" gate between Pond A8 and Alviso Slough that opened in July 2010. The gate is now operated year round with the full 40-foot wide gate kept open. As part of Phase 1 restoration actions, Ponds A5 and A7 were also connected to Pond A8 and Pond A8S by breaching internal levees between these ponds. Phase 1 also added one culvert into the sloughs adjacent to Ponds A5 and A7. As Part of Phase 2, habitat transition zones will be constructed at the southwest and southeast corners of Pond A8S. The tops of the habitat transition zones will be about 9 feet elevation NAVD88. The lengths of the transition zones along the southwest and southeast corners will be about 2,075 feet each. The habitat transition zones will be separated in the middle to allow future connections with San Tomas Aquino Creek and Calabazas Creek to the south.

Ravenswood Complex

36. The Ravenswood complex includes five subsystems and seven ponds (R1, R2, R3, R4, R5, S5, and SF2) that comprise about 1,600 acres in San Mateo County. Phase 2 work at the Ravenswood Ponds includes a breach to Ravenswood slough, four water control structures, a number of other habitat enhancements, flood risk management components, and public access and recreation features. Ponds R1 and R2 will continue to be managed as seasonal ponds in Phase 2. Pond SF2 was reconfigured in Phase 1, with the addition of about 30 habitat islands and the construction of new water intake and outflow gates. Pond SF2 will continue to be operated to circulate water around the habitat islands to meet water quality objectives, discharge requirements, and to provide forage for roosting and nesting birds in the pond. Pond R3 will be operated as an enhanced managed pond for small shorebirds, including western snowy plover (*Charadrius nivosus nivosus*). Ponds R5 and S5 will be converted to managed ponds for dabbling ducks and other bird guilds. Pond R4 will be restored to tidal marsh by connecting it to the Bay through a breach into Ravenswood Slough.

37. The levee at the northeastern corner of Pond R4 will be breached to open the pond to tidal flows from Ravenswood Slough. Material from the breached levee will be used to build ditch blocks to direct flows through the borrow ditch to the historic slough trace and into the pond's center; material may also be used to improve levees or construct habitat transition zones. The bottom width of this breach will be about 200 feet, with an invert elevation of 2 feet NAVD88 and with side slopes of 3:1 (h:v). A channel about 470-feet long will be excavated through the existing fringe tidal marsh to connect the breach to Ravenswood Slough. About 2,890 feet of pilot channels will

be created in the interior of the pond. The invert elevation will be at 2 feet NAVD88 to roughly match the invert elevation of existing channels within Pond R4. The bottom width of the channel cut will be roughly 50 feet wide with side slopes of 2:1 (h:v). Excavated material will be used to enhance levees, and to construct habitat transition zones and ditch blocks in the existing borrow ditches west of the R4 breach. Material for the ditch blocks will be from a combination of imported fill material and local material from levee lowering or breaches. About 960 linear feet of the northwestern levee on the edge of Pond R4 will be lowered to HTL to improve habitat connectivity between Pond R4 and Greco Island/West Point Slough. The new top elevation will be at about 8 feet NAVD88 and side slopes will be about 2:1 (h:v). Material from the lowered levee will be used to raise levees or construct habitat transition zones.

38. Ponds R5 and S5 will be converted into a single enhanced, managed pond through removal or modification of levees within and between the ponds. A habitat island will be created between Ponds R5 and S5 from the remnants of the internal levee currently between those ponds. The habitat island surface will be about 1.77 acres, with a relatively flat top at elevation 9 feet NAVD88 (above the HTL elevation), with side slopes of 2:1 (h:v). Sand, shell, or other suitable topping will be added to the island to enhance its usefulness for the birds that would use it for roosting and nesting, and to help control invasive vegetation. Four water control structures (pipe culverts through levees) will be installed. One will be installed at the levee between Ponds R4 and R5. Another will be installed between Pond S5 and Flood Slough. A third will be installed between Ponds S5 and R3. The fourth will be installed between Pond R3 and Ravenswood Slough. These structures will allow for separate control of different types of managed pond habitat for various guilds of birds, by allowing different bottom depths and elevations. Water control structures are summarized in Table 5. The water control structures will be gated at both ends to allow two-way control over flows in or out of each pond.

Table 5. Ravenswood Ponds – Water Control Structures

Location	Pipe Quantity	Inside Diameter (Inches)	Pipe Length (Feet)	Invert Elevation NAVD88 (Feet)	Pile Quantity*	Total Area** (Square Feet)
Pond R5/S5 to Flood Slough	2	48	183	2	8	3,790
Pond R5/S5 to Pond R4	2	48	78	3.5	8	1,650
Pond R5/S5 to Pond R3	1	36	67	4.5	8	690
Pond R3 to Ravenswood Slough	1	36	62	2	8	640
Total	**6**	**N/A**	**390**	**N/A**	**32**	**6,770**

Notes:
*All piles are 16-inch diameter and about 20 feet long.
**Total Area includes pipe-culvert, gates, and bridges at each control structure.

About 4,700 feet of improved levee will be constructed on existing levees. The berm-like levees along both sides of the All American Canal (AAC) will be raised and strengthened, and the AAC will be filled in to create a single levee. Constructing this improved levee will replace the de facto flood risk protection currently provided by the outboard levees on Pond R4. Improvements at the western end of the AAC would extend north along the Ponds R4/R5 border and south along the R3/S5 border, to isolate Ponds R5 and S5 from other ponds. Most of the material for the improvements will come from off-site sources, though some may be from local cut activities. The improved levee will consist of a 60-foot-wide crest, with side slopes at about 3.5:1 (h:v) on the north side and 4.5:1 (h:v) on the south side. The crest of the levee will be at elevation 11 feet NAVD88. A habitat transition zone will be constructed on the north face of this levee that will provide increased adaptability to sea level rise over time, as described below.

The improved levee will become wider as it transitions to meet the sections of improved levee that will form the eastern borders of Ponds R5 and S5 and will also be the basis of a public access trail and viewing platform. The AAC will not have a trail on top, but will allow access by vehicles for maintenance and monitoring activities. A gate will be placed at the viewing platform area to restrict access.

A 2,500-foot long habitat transition zone will be constructed in the western side of Pond R4, up against the Bedwell Bayfront Park (a closed landfill) border as shown in Figure 6. A

second, 5,100-foot long habitat transition zone will extend northward into Pond R4 from the improved AAC levees. The habitat transition zones will be at an elevation of 9 feet NAVD88 along the levees or the high ground of the park and have side slopes of 30:1 (h:v) with varying steeper slopes at end transitions.

A trail will be constructed along the improved eastern levees of Ponds R5 and S5, and linked to the existing trails outside of these ponds. As shown in Figure 6, the northern end would connect to the existing trail in Bedwell Bayfront Park; the southern end would connect to the Bay Trail spine. This trail would be approximately 2,750 feet long and 10 feet wide with 2 feet of shoulder on each side. Trail surfacing materials will be decomposed granite with timber or concrete edging. A viewing platform will be constructed near the central point of this trail, at the junction with the improved AAC levee. The viewing platform will have benches and interpretive signage on pedestals and/or information panels.

Table 6. Ravenswood Ponds – Recreational Features: Trail Lengths and Areas

FEATURE	LENGTH (FEET)	AREA (SQUARE FEET)
Ponds R5 and S5 eastern levee	2,750	38,500
Total	**2,750**	**38,500**

Table 7. Ravenswood Ponds – Recreational Features: Viewing Platforms Footprints

FEATURE	AREA (SQUARE FEET)
Ponds R5 and S5 eastern levee viewing platform	9,960
Total	**9,960**

There are many complicated easements as well as several different landowners in the area where Flood Slough, the Pond S5 forebay, SR 84, Marsh Road, Bedwell Bayfront Park, and the driveway into the park, all come together. This area includes various parcels and their owners, as well as easements for utilities or access. Cargill holds fee title on much of Flood Slough and has a 10-foot wide pipeline strip of property along the entire southern border of Ponds S5 and R3. Cargill's coordination and approval will be required for any proposed activities that would take place on, cross, or otherwise affect lands or properties in which it has property interest. Proposed activities that are expected to require coordination with and approval from Cargill include construction of fencing, building a trail that would cross Cargill's pipeline easement, and connecting Flood Slough to the S5 forebay. Because the City of Menlo Park and the West Bay Sanitary District are also landowners in the area and the California Department of Transportation and PG&E hold utility easements in the area, coordination with these entities will also be required.

II. Phase 1 Marsh Restoration & Pond Management

Site Location & Description of SBSPRP Phase 1 Activities

39. The 3,270-acre Phase 1 actions of the SBSPRP included tidal habitat restoration, pond reconfiguration, and recreation/public access actions, as well as monitoring activities and applied studies in six different ponds, or pond systems, across the three pond complexes (see Figure 2). Phase 1 target habitats in Ponds A6 and E8A/E9/E8X are expected to develop over 50 years, but may take longer. The areas of each pond or group of ponds and the predicted target habitats are listed in Table 8.

Table 8. Phase 1 Restoration Actions

PHASE I RESTORATION ACTION	START OF CONSTRUCTION	TYPE OF RESTORATION	ACREAGE	CONSTRUCTION COMPLETION
Alviso Pond Complex (USFWS)				
Pond A6	Summer 2010	Tidal habitat	360	2010
Pond A8	Summer 2009	Reversible muted tidal habitat	1,440[1]	2011
Pond A16 and A17	Fall 2011	Reconfigured managed pond and tidal habitat	373[2]	2013
Ravenswood Pond Complex (USFWS)				
Pond SF2	Fall 2008	Reconfigured managed pond	237	2010
Eden Landing Pond Complex (CDFW)				
Pond E8A, E9, and E8X	Summer 2009	Tidal habitat	630	2011
Ponds E12 and E13	Summer 2012	Reconfigured managed pond	230	2013
Total Acreage			**3,270**	

[1] This acreage includes Ponds A5, A7, and A8S, which are affected by tidal inundation over the low internal levees that separate these ponds from Pond A8.
[2] This acreage includes both Pond A16 (242 acres) which will be a reconfigured managed pond and Pond A17 (131 acres) which was breached to create tidal habitat.

Note 1: Recreational facilities include: Alviso Pond Complex improvements to the Bay Trail; Ravenswood Pond Complex improvements to Bay Front Park and Pond SF2; and Eden Landing Complex trail construction, kayak launch, and viewing platforms.
Note 2: Not shown in Table 1 is the 480-acre Island Pond tidal marsh restoration already approved by the Regional Water Board under the ISP, Order No. R2-2004-0018.

Specific Phase 1 Activities

POND A6 TIDAL HABITAT RESTORATION

40. Alviso Pond A6 was restored to tidal action to create about 330 acres of tidal salt marsh and tidal channel habitat through levee breaching, levee lowering, pilot channel excavation to the sloughs, and the installation of borrow ditch blocks. The habitat will evolve over time through natural tidal processes. The Pond A6 restoration did not include recreation, public access, or flood control features.

POND A8 REVERSIBLE MUTED TIDAL HABITAT CONVERSION

41. Phase 1 actions at Pond A8 introduced muted tidal action to create approximately 1,400 acres of shallow subtidal habitat in Ponds A5, A7, and A8 through the construction of a 40-ft notch at the southern end of Pond A8, and modified management of existing water control structures on Ponds A5 and A7. To facilitate tidal exchange, the Project excavated an approximately 475-foot-long pilot channel through the fringe marsh of Alviso Slough, immediately outboard of the armored notch. The top width of the constructed pilot channel was over-excavated to approximately 130 feet to minimize erosion. The depth of the pilot channel extended through the erosion-resistant vegetation and root mass to approximately 9 feet below existing grade. Restoration of tidal action to Pond A8 was reversible. In the event that unacceptable ecological impacts begin to occur, tidal exchange to Pond A8 can be eliminated to prevent long-term adverse impacts. If tidal exchange to Pond A8 is eliminated, water management at Ponds A5, A7 and A8 would revert to the original Initial Stewardship Plan (ISP) operations.

42. Compared to water discharges through culverts fitted with flap gates, the two-way (ebb and flood) flows across the open notch at Pond A8 minimizes the potential for fish trapping inside the pond. Partial restoration of tidal prism in these ponds promotes channel scour and increases salinity along Alviso Slough. The expected potential increases in channel width and salinity, and likely increase in salt marsh dominated vegetation over the existing freshwater marsh dominated vegetation will help improve navigation access in Alviso Slough in a sustainable fashion. At this time, all of the 'bays' in the armored notch are kept open year round.

POND A16/A17 RECONFIGURATION, VIEWING PLATFORM, AND INTERPRETIVE DISPLAY

43. ***Alviso System A16/A17.*** This system consists of two ponds (A17 and A16). As part of Modification 1 to Phase 1, Pond A16 was maintained as a reconfigured managed pond and Pond A17 was restored to tidal habitat. The table below shows the expected hydraulic residence times for Pond A16 in the summer. The Pond A16 managed pond was reconfigured to create 16 islands for nesting birds and shallow water habitat for shorebird foraging, via the installation of 2 new water control structures (inlet and outlet), excavation of a pilot channel to Artesian Slough, and the construction of the nesting islands. Pond A17 (131 acres) was restored to tidal habitat by breaching the existing levees along Coyote Creek. Water is introduced into Pond A16 from restored tidal habitat in Pond A17. The intakes into Pond A16 from Pond A17 is screened to exclude anadromous fish. In addition, a viewing platform and interpretive station

were constructed at Pond A16 and a fishing platform and interpretive station were constructed at the northwestern end of Pond A17 in Coyote Creek.

Table 9: Summer Hydraulic Residence Times for Pond A16

Pond	Area (acres)	Depth (ft)	Volume (acre-ft)	Outlet Flow (ft^3/s)	Residence Time (days)
Revised Pond A16	242	1.68	408	60	3.4

STEVENS CREEK TO SUNNYVALE BAY TRAIL SPINE

44. The 2.25-mile long Stevens Creek to Sunnyvale Bay Trail Spine is an integral spine connection in the Association of Bay Area Government's (ABAG) Bay Trail project, a partially constructed 500-mile recreational "ring around the Bay." The spine trail will be designed in accordance with ABAG Bay Trail Design Guidelines that require a two-way, multi-use trail 10 to 12 ft in width and paved with asphalt, with 2-ft dirt shoulders on either side. In the longer term, this alignment will include a flood protection levee. The Bay Trail will then be retrofitted and incorporated into the design of the levee. As this may take many years, this segment of Bay Trail will be opened for immediate access to this part of the Project area, using the existing levee until a more permanent segment can be constructed.

    No significant construction activities for this trail were implemented as part of Phase 1. The existing levee was opened to public use with minor amenities added. Future improvements to the trail to meet Caltrans Class I trail standards will be the subject of a future Biological Assessment tiered to the Programmatic action.

POND SF2 RECONFIGURATION, VIEWING PLATFORM, INTERPRETIVE STATION, AND TRAIL UPGRADES

45. Ravenswood Pond SF2 was reconfigured to create 237 acres of high quality nesting and shallow water foraging habitat for shorebirds. Phase 1 work included the installation of 2 new water control structures, excavation of pilot channels through the fringe marsh outboard of the new water control structures, development of an internal water circulation system using a series of berms and water control structures such as flashboard weirs, and the construction of 36 nesting islands. Three cells were created; the two eastern cells were reconfigured to create nesting islands for birds and shallow water habitat for shorebird foraging. The third, western cell is managed to provide snowy plover habitat similar to existing conditions. In addition, 2 viewing platforms and interpretive stations were constructed, and portions of the existing trail along Pond SF2 were upgraded.

BAYFRONT PARK VIEWING PLATFORM

46. A viewing platform at Bayfront Park was constructed at one of the high points in the Park that provides a vantage point to view Greco Island as it meets Pond R4.

PONDS E8A, E8X, AND E9 TIDAL HABITAT RESTORATION

47. Eden Landing Ponds E8A/E8X/E9 were restored to tidal action to create tidal salt marsh and tidal channel habitat through levee breaching, excavation of pilot channels through the fringe marsh outboard of certain levee breaches, levee lowering, and the installation of borrow ditch blocks to create 630 acres of restored tidal marsh habitat. The restoration was designed to maintain or improve existing levels of flood protection in Old Alameda Creek.

PONDS E12 AND E13 RECONFIGURATION, INTERPRETIVE STATION, AND TRAILS

48. Phase 1 activities included the reconfiguration and management of Ponds E12 and E13 as a small-scale salt pond system to create 230 acres of high quality shallow water foraging areas at varying salinities and 6 constructed nesting islands. Phase 1 activities included the replacement of an existing pump, the installation of three new water control structures for intake and discharge, development of an internal water circulation system using a series of berms and flashboard weirs, and the construction of nesting islands. Ponds E12 and E13 were reconfigured to create shallow water foraging habitat for migratory shorebirds, with a range of salinities, and a limited number of islands for nesting bird habitat.

MT. EDEN CREEK VIEWING PLATFORM, BOAT LAUNCH, INTERPRETIVE STATION, AND TRAIL

49. A trail was constructed along the existing levee on the south side of Mt. Eden Creek. This trail is 6 to 8 ft wide on an existing managed pond levee, and has a firm and stable, hardened surface for public access. The nearby staging area supports 58 motor vehicles and was being built as part of the restoration plan for the northern 835 acres of the Eden Landing Ecological Reserve (ELER), a separate action from the SBSPRP. A kayak/boat launch, located north of Pond E12 and on the north side of Mt. Eden Creek, is accessible year-round from the levee road that leads from the staging area to the Mt. Eden Bridge. Mt. Eden Creek is currently being restored under a separate action such that kayakers can travel 2.5 miles from the launch point to the Bay.

50. A total of 5 miles of new trails were constructed along existing levees as part of the Phase 1 public access plan at Eden Landing. New trails have firm and stable, hardened surfacing to allow for hikers and cyclists, and ADA compliant features were installed as funding allowed. The managed pond levees provide firm and compacted surfaces so paving was not be required. The trails are open to the public.

51. The historic Oliver Salt Works consists of remnants of the old salt production/ harvesting-related facilities (e.g., pilings, foundations). Under the Phase 1 actions, the salt works were made accessible to the public by a new trail. An interpretive station tells the history of the salt works at this location, explains how salt is produced, and explains the salt works' cultural, economic, and social linkage to the greater San Francisco Bay Area.

III. Management of Ponds Under the Initial Stewardship Plan (ISP)

ISP Activities Since 2004

52. Since 2004, the ponds within the SBSPRP area have been managed by the Discharger to provide habitat values while the long-term restoration plan is being developed. During ISP implementation, Bay waters have continued to be circulated through water control structures and existing levees have been maintained for minimum flood protection. Additionally, some ponds have been managed for bird or other wildlife habitat as seasonal ponds, which fill with rain water in the winter, and which dry through evaporation in the summer months. Finally, other ponds have been operated as high salinity ponds. The Island Ponds (Ponds A19, A20, and A21) in the Alviso pond complex were breached to tidal action in March 2006, during the ISP. Two breaches were made to Pond A19, one breach was made to Pond A20, and two breaches were made to Pond A21. All breaches were on the south side of the ponds, connecting the ponds to Coyote Creek. Phase 2 activities will add breaches to Mud Slough on the north side of Ponds A19 and A20 (See Finding 27).

53. Modification 1 to Phase 1 restoration actions directly impacted the design and management of Ponds A6, A8, A16, A17, SF2, E8A, E8X, E9, E12, and E13. The Phase 1 Order also continued to permit the Discharger to operate the remaining ponds under the management protocols that were authorized under the ISP. Most of the remaining ponds are managed to maintain open water conditions. Without the introduction of Bay water, these ponds would dry down during the summer and become seasonal ponds in the winter, which would significantly reduce open water habitat. Operating former salt ponds as managed ponds is considered by the Board to be a transitional phase between salt-making and restoration. This transitional lagoon management phase for most of the former salt ponds benefits the environment in the near term by providing shallow open water habitat for shorebirds, thus avoiding the consequences of operating them as seasonal ponds (See Finding 102).

54. While the lagoon management phase benefits the environment by providing habitat, it has posed challenges for water quality, particularly dissolved oxygen, due to algae proliferation in the ponds during the summer when the days get longer and hotter. The water quality impacts associated with operating former salt ponds as managed ponds could be overcome by opening the ponds to unrestricted tidal action. However, at this time, there are constraints that prevent the Discharger from moving more aggressively in this direction. First, the Discharger needs to ensure that flood control structures are built between the ponds and developed lands before it can consider opening much of the Project Area ponds to tidal action. Additionally, the Alviso ponds are subsided, so the Discharger needs to phase tidal restoration to ensure that sediment accretion in these ponds will not result in a corresponding erosion of nearby mudflats. At this time, natural processes (e.g., windy conditions) resuspend sediment from mudflats, creating high sediment concentrations in the water column that are subsequently redeposited on the mudflats, when the water column becomes more quiescent. If the Discharger does not carefully phase the restoration of salt ponds to tidal action, additional flow into the salt ponds could result in the transport, and

subsequent deposition, of much of the sediment into former salt ponds, instead of to mudflats. Finally, because former salt ponds provide bird habitat, the Discharger needs to carefully transition pond systems from managed to tidal while ensuring that existing shorebird and waterfowl habitat is not adversely affected. This Order requires that, through applied studies and adaptive management, the Discharger address the above constraints. In other words, the Discharger needs to maximize restoration of former salt ponds to tidal marsh, but must do so in a phased approach for biological reasons (i.e., maintaining bird habitat).

55. Findings 40 to 51 describe each pond system in more detail. The purpose of these findings is to (a) illustrate how flow will be routed in the Alviso and Eden Landing Pond Systems, (b) document the dimensions of individual pond systems, and (c) illustrate the time it will take Bay water to circulate through pond systems that operate under directional flow. The residence time of pond systems is important because stagnant waters (i.e., ponds with long residence times) are more likely to experience water quality problems, such as low dissolved oxygen levels, due to excessive algal growth. While the residence times indicated in Tables 4 through 8 reflect averages and will likely change based on management practices implemented by the Discharger, they do illustrate the significant lag time and subsequent management constraints involved in improving dissolved oxygen levels by flow management alone.

Alviso Complex

56. The findings below describe how USFWS will operate ponds that are affected by Phase 1 actions and the remaining ponds operating under the ISP. To maximize water circulation patterns within ponds, USFWS plans to operate all ponds that are unaffected by Phase 1 or Phase 2 actions as directional systems (as described in the findings below).

57. ***Alviso System A3W.*** This system consists of five ponds that were not affected by Phase 1 or Phase 2 actions. The intake pond AB1 receives water from the Bay via a 36-inch gate structure and from a 48-inch culvert. The outlet pond A3W discharges pond water through three 48-inch gates to Guadalupe Slough (Discharge Point A-A3W-1) near the Sunnyvale Water Pollution Control Plant (WPCP) outfall. The normal flow in this system follows two routes. One route is from AB1 to A2E to A3W. The second route is from AB1 to AB2 and then to A3W. This system also includes pond A3N, which operates as a seasonal pond. The table below shows the expected summer hydraulic residence times for this system.

Table 10: Range of Summer Hydraulic Residence Times for Pond System A3W

Pond	Area (acres)	Depth (ft)	Volume (acre-ft)	Outlet Flow (ft^3/s)	Residence Time (days)
AB1	142	1.2	170.4	21 to 62	1.4 to 4.1
AB2	170	1.0	170.0	21 to 62[1]	6.7 to 19.7
A2E	310	2.1	651		
A3W	560	1.8	1008	21 to 62	8.2 to 24.2
Total	1182[2]				16 to 48

[1] In this table, the outlet flow for AB2 and A2E is a summation as these ponds operate in parallel. To estimate the hydraulic residence time of the system, Ponds AB2 and A2E were assumed to have equal residence times.

[2] The total area does not include Pond A3N (163 acres) since the Discharger proposes to operate it as a seasonal or batch pond and thus flows to this pond are not expected to be significant.

58. ***Alviso System A14***. This system consists of seven ponds that were not affected by Phase 1 actions and will not be affected by Phase 2 actions. The intake to pond A9 receives water from Alviso Slough through two 48-inch gates. The outlet pond A14 discharges water through two 48-inch gate structures into Coyote Creek (Discharge Point A-A14-1). The route of flow through this system is from A9 to A10 to A11 to A14. Over the past few years, the Discharger has operated ponds A12, A13, and A15 as batch ponds to maintain higher salinity levels (between 80 and 120 ppt) for brine shrimp habitat. Because water intakes at A9 have the potential to entrain migrating salmonids, this system cannot intake water from Alviso Slough between December and April. The table below shows the expected summer hydraulic residence times for this system. Since the Discharger plans to close the intake structure at pond A9 during the winter to avoid entraining migrating salmonids, relatively small flows will discharge from this system in these months.

Table 11: Range of Summer Hydraulic Residence Times for Pond System A14

Pond	Area (acres)	Depth (ft)	Volume (acre-ft)	Outlet Flow (ft^3/s)	Residence Time (days)
A9	385	2.2	847	22 to 44	9.7 to 19.4
A10	249	2.6	647.6	22 to 44	7.4 to 14.8
A11	263	3.1	815.3	22 to 44	9.3 to 18.7
A14	341	0.9	306.9	22 to 44	3.5 to 7.0
Total	1238[1]				30 to 60

[1] The total area does not include Ponds A12, A13, and A15 (309, 269, and 249 acres) since the Discharger proposes to operate these ponds on a batch basis and thus flows to them are not expected to be significant.

59. ***Alviso System A23***. This system consists of two ponds (Ponds A22 and A23) that are owned by USFWS. During the ISP, Cargill managed these ponds as seasonal ponds (intake only, no discharge) to provide snowy plover habitat. Cargill transferred these ponds to USFWS in 2011. USFWS continues to operate them as seasonal ponds.

Eden Landing Complex

60. The findings below describe how CDFW will operate ponds that are affected by Phase 1 actions and the remaining ponds. The tables presented below describing the Eden Landing Systems do not include estimated residence times because CDFW operates all of the Eden Landing systems under muted tidal flows.

61. ***Eden Landing System E2 and E2C***. The E2 system consists of four ponds and the E2C system consists of eight ponds. Neither of these systems will be affected by the Phase 2 actions authorized by this Order. In 2005, CDFW linked these systems together. The objective of system E2/E2C is to maintain year-round open water habitat in Ponds E1, E2, E6, E5, and E2C and winter open water habitat in all of the ponds (E1, E2, E7, E4, E6, E5, E2C, E1C, E4C, E5C, and E6C). Pond E3C, owned by Cargill, is still part of the E2C system and will be operated as year-round open water habitat until it is decoupled from circulation patterns. In the E2 system, the intake pond E1 receives water from Old Alameda Creek through four 48-inch gates and through a 30,000 gallon per minute (gpm) pump. During the winter months, the inflow from Pond E1 circulates through Ponds E7, E6, E5, E4, and E2 before discharging to the Bay (Discharge Point E-2-10) through two 48-inch gates. In the summer months, CDFW intakes water at E-1 and transfers water from E-1 to E-2, while operating E-2 under muted tidal conditions. During the fall, CDFW links systems E2 and E2C by routing water from pond E7 to ponds E6 and E5 to makes up for evaporation losses and reduce salinity. CDFW operates ponds E6 and E5 as batch ponds. This means that ponds E6 and E5 have low salinity in the spring and CDFW

allows for evaporation to increase salinity during the summer months. On average, CDFW estimates that salinity levels in ponds E6 and E5 will increase from about 30 ppt to 120 ppt between May and November. The high salinity waters in Ponds E6 and E5 are routed, in the winter months, to ponds E4 or E6C and diluted before reaching discharge locations. In the E2C system, CDFW operates pond E2C under muted tidal conditions (intake and discharge at the same structure) to the Alameda Flood Control Channel (Discharge Point E-2C-14). CDFW operates Ponds E6C, E4C, E5C, and E1C as seasonal ponds. This means that ponds E6C, E4C, E5C, and E1C have open water conditions during the winter months, shallow water conditions in the spring and fall, and dry conditions during the summer months. To moderate salinity levels and improve dissolved oxygen levels in the E2C system, CDFW increases intake volumes at E2C and periodically drains intake waters to adjacent seasonal ponds (E5C, E4C, and E1C) to improve turnover of pond system waters. The surface area for ponds in the E2 and E2C systems are shown in the tables below.

Table 12: Surface Area of Pond System E2

Pond	Area (acres)
E1	337
E7	209
E4	175
E2	673
Total	1394

Table 13: Surface Area of Pond System E2C

Pond	Area (acres)
E6	176
E5	159
E6C	78
E4C	175
E3C	153
E2C	24
Total	942

62. ***Eden Landing System E6A***. This system consists of three ponds (E6A, E6B, and E8) and two control ponds (less than one-acre each) that will not be affected by Phase 2 actions. The ponds in this system are managed seasonally, with varying salinities ranging from low to medium levels. During the summer months, Pond E6A and E6B may be operated as intake ponds with no discharge to maintain breeding habitat and shallow water foraging habitat for the western snowy plover. In other words, during the summer months, CDFW operates this system to enhance seasonal ponding via limited intake at E6A. During the fall, CDFW would fill the ponds with water so it can operate these ponds as open water habitat during the winter months, with Pond E6A and E6B operating under muted tidal conditions. Pond E8 generally operates as a seasonal pond with intake and flow through to E6B and E6A in the winter. The surface area for ponds in the E6A system is shown in the table below.

Table 14: Surface Area for Pond System E6A

Pond	Area (acres)
E8	180
E6B	284
E6A	340
Total	804

63. ***Eden Landing System E8A***. This system consists of six ponds (Ponds E9, E8A, E8X, E12, E13, and E14) that were modified by Phase 1 restoration efforts. Eden Landing Ponds E8A/E8X/E9 were restored to tidal action in Phase 1 to create tidal salt marsh and tidal channel habitat. Ponds E12, E13, and E14 continue to be operated as seasonal ponds (i.e., these ponds are open water during the winter and become dry during the summer months), as they were under the ISP.

64. ***Eden Landing System E11***. This system consists of two ponds (E10 and E11) that are not be affected by Phase 1 or Phase 2 actions. The Discharger operates E10 under muted tidal conditions and E11 as a seasonal pond. The surface area for ponds in the E11 system is shown in the table below.

Table 15: Surface Area for Pond System E11

Pond	Area (acres)
E10	214
E11	118
Total	332

Ravenswood Complex

65. USFWS owns the Ravenswood ponds, which are part of the larger Redwood City pond complex. The Ravenswood complex includes five subsystems and seven ponds (R1, R2, R3, R4, R5, S5, and SF2) that comprise about 1,600 acres in San Mateo County. During the ISP, Cargill managed ponds north of Highway 84 (i.e., Ponds 1, 2, 3, 4, 5, and S5) as batch ponds. Prior to Phase 2, USFWS has been operating these ponds as seasonal ponds (intake only, no discharge). Ponds R1 and R2 will continue to be managed as seasonal ponds in Phase 2. Pond SF2 will continue to be operated to circulate water around the habitat islands to meet water quality objectives, discharge requirements, and to provide forage for roosting and nesting birds in the pond. Phase 2 actions will restore Pond R4 to tidal marsh by connecting it to the Bay through a breach into Ravenswood Slough. Pond R3 will be operated as an enhanced managed pond for small shorebirds, including western snowy plover (*Charadrius nivosus nivosus*). Ponds R5 and S5, which are currently seasonal ponds, will be converted into a single enhanced, managed pond through removal or modification of levees within and between the ponds. Four water control structures (pipe culverts through levees) will be installed. These structures will allow for separate control of different types of managed pond habitat for various guilds of birds, by allowing different bottom depths and elevations.

Overview of Pond Discharges

66. This Order permits discharge from former salt ponds as waters from the South Bay are taken into pond systems and then discharged more-or-less continuously. The main parameters of concern for pond discharges include salinity, metals, dissolved oxygen, pH, and temperature.

67. ***Salinity Levels of Pond Discharges.*** For ponds unaffected by Phase 1 or Phase 2 actions, the Discharger will continue to operate these ponds to limit salinity discharge levels. While the Discharger designed pond systems to ensure that discharged salinity levels remain below 40 ppt, the Discharger modeled the impact on receiving water salinities of discharging salinity levels near 44 ppt, in order to be conservative (for development of Order No. R2-2004-0018). This modeling effort showed that

discharging pond waters at salinity levels up to 44 ppt will not cause any significant or potentially significant impacts to any receiving waters.

68. ***Salinity as a Surrogate for Metals***. To ensure that pond waters do not discharge metals at toxic levels, this Order uses salinity as an indicator parameter for the concentrations of metals. Many of the metals present in the ponds are present as inorganic salts. Therefore, metals concentrations are anticipated to follow salinity levels. Increases in salinity represent a worst-case scenario for the parallel increase in metals concentrations. In other words, if only evaporation affected metals concentrations, they would increase proportionately with salinity. However, other factors within the ponds, such as biological uptake and adsorption to fine sediments, will reduce metals concentrations. Accordingly, using salinity as a surrogate for metals concentrations should be more protective, as it will only consider evaporation, which is the mechanism by which metals concentrations increase. Besides offering more protection, the use of salinity will give the Discharger immediate feedback on conditions at discharge points and within pond systems, and thereby enable it to implement corrective measures in a timely manner based on monitoring results.

69. ***Metals Concentrations.*** Metals concentrations in the discharge should not exceed applicable water quality objectives, provided that the Discharger operates each pond system to maintain salinities below 44 ppt. The tables below show the estimated maximum metals concentrations associated with an in-pond salinity of 44 ppt. This indicates that, if salinity levels remain below 44 ppt, discharges from the Alviso and Eden Landing Systems will meet water quality objectives for metals.

Table 16: Maximum Salinity and Associated Metals Levels for the Alviso System[1]

Maximum Salinity	Cr µg/L	Ni µg/L	Cu µg/L	Zn µg/L	As µg/L	Se µg/L	Ag µg/L	Cd µg/L	Hg ng/L	Pb µg/L
44 ppt	1.22	8.05	2.98	1.83	10.7	0.4	0.01	0.08	1.8	0.31
WQO[2]	11.4	27	13	86	36	5.0	2.2	0.27	50	3.2

[1] To estimate the maximum metals concentrations from the Alviso System for continuous discharges, Order No. R2-2004-0018 considered an average of Regional Monitoring Program (RMP) data from 1997-1999 at the South Bay Station and salt ponds with salinities of 31.6 and 42 ppt.

[2] The Basin Plan only specifies water quality objectives south of Dumbarton Bridge for copper and nickel. For the other inorganics, water quality objectives are from the California Toxics Rule. Since the Board must express limits for metals in the total recoverable form, Board staff used default translators to convert dissolved water quality objectives to total. The water quality objectives for chromium, cadmium, and lead are freshwater driven and based on a hardness of 100 mg/L as $CaCO_3$, which is the lowest value found in sloughs (in this case Guadalupe Slough) monitored near the discharge in the Regional Monitoring Program.

Table 17: Maximum Salinity and Associated Metals Levels for the Eden Landing System[1]

Maximum Salinity	Cr µg/L	Ni µg/L	Cu µg/L	Zn µg/L	As µg/L	Se µg/L	Ag µg/L	Cd µg/L	Hg ng/L	Pb µg/L
44 ppt	3.67	11.8	4.27	5.48	11.9	0.36	0.02	0.10	16	0.84
WQO[2]	11.4	16.3	4.6	58	36	5.0	2.3	0.27	25	3.2

[1] To estimate the maximum metals concentrations for the Eden Landing System for continuous discharges, Order No. R2-2004-0018 considered an average of RMP data from 1997-1999 at the Dumbarton Bridge Station and salt ponds with salinities of 31.6 and 42 ppt.

[2] These Basin Plan water quality objectives apply to waters north of Dumbarton Bridge except for copper, which is from the California Toxics Rule. This is because the Basin Plan does not specify a saltwater objective for copper. The Discharger performed site-specific translators for copper and nickel. Therefore, the values shown in Table 16 represent site-specific water quality objectives.

70. ***Diurnal Variations in Dissolved Oxygen and pH***. Algal growth in salt ponds can cause dissolved oxygen and pH levels to vary significantly over the course of a day. This is because during daylight hours, photosynthesis will produce oxygen and consume dissolved carbon dioxide. At night, respiration will produce dissolved carbon dioxide and consume oxygen. Therefore, any significant algal growth will cause dissolved oxygen and pH levels to peak during the late afternoon and to be at their lowest levels in pre-dawn. Since implementation of the ISP in 2004, continuous monitoring data within former salt ponds shows that pH levels can vary significantly and are often above the Basin Plan objective of 8.5. However, receiving water data has also shown that high pH levels from pond discharges are quickly normalized in nearby sloughs and the Bay. Continuous monitoring data for dissolved oxygen within former salt ponds has also shown significant variations throughout the day. As described in later findings, the biggest water quality challenge for former salt ponds has been maintaining dissolved oxygen at concentrations that are safe for aquatic life.

71. ***Temperature***. Since implementation of the ISP began in 2004, continuous monitoring data show that discharges from former salt ponds have complied with the Thermal Plan. Due to shallow water depths and limited tidal exchange, water temperature in the salt ponds is elevated and varies widely throughout the day. Annual water temperatures within the ponds generally range from 40 to 80°F and generally track air temperature. The State's Thermal Plan indicates that discharges shall not exceed the natural temperature of receiving waters by 20°F, and discharges shall not cause temperatures to rise greater than 4°F above the natural temperature of the receiving water at any time or place.

72. ***Migration of Salmonids***. Steelhead trout and Chinook salmon migrate in South Bay sloughs, or slough channels that receive pond discharges. During certain times of the year, Coyote Creek and Alviso Slough may contain steelhead trout and Chinook salmon. The table below describes the upstream and downstream migration periods when former salt ponds have the potential to affect migrating salmonids.

Table 18: Migration Periods for Salmonids

Species	Upstream Migration	Downstream Migration
Steelhead Trout	January-March	March-April
Chinook Salmon	September-November	March-April

While Steelhead Trout and Chinook Salmon migrate primarily downstream in March and April, storm induced migrations can begin as early as December. For this reason, NMFS recommends that the Discharger close intakes on all salmonids creeks and sloughs from December through April, with the exception of the notch between Pond A8 and Alviso Slough. Pond A17 was breached to full tidal action as part of Modification 1 to Phase 1, and a fish screen was installed at the Pond A16 intake from Pond A17. This Order requires that, during the December through April period, the Discharger shall close the intake structure at Pond A9 and operate the fish screen at Pond A16.

73. ***Adaptive Management to Improve Water Quality.*** Since the ISP was implemented in 2004, the interim management of discharges from former salt ponds has posed challenges for water quality, particularly dissolved oxygen, due to algae proliferation in the ponds when the days get longer and hotter. The Discharger has tried a number of corrective measures to improve oxygen levels. These include switching pond systems from directional flow to muted tidal flow, installing baffles, installing solar-powered aerators, and increasing flows to reduce residence times. While some corrective measures (e.g., baffles, muted tidal flows) appear to have improved discharge dissolved oxygen levels in some pond systems, the use of solar powered aerators and attempts to increase flow through the ponds have not had discernible results because the ponds are too large for existing intake/discharge structures or a few aerators to have a meaningful impact on dissolved oxygen levels at the discharge point.

74. ***Dissolved Oxygen and Within Pond Fish Mortality.*** While both USFWS and CDFW have experienced difficulty in maintaining adequate dissolved oxygen levels at pond discharge points, the problem, at least with respect to fish mortality, has been more severe for ponds managed by USFWS. During the summer months, ponds in the Alviso complex intake more Bay waters, and therefore, more fish than those in the Eden Landing complex. This is because ponds in the Alviso complex are subsided due to historic groundwater pumping. Between August of 2005 and July of 2016, there have been 11 reports or incidents in which low dissolved oxygen levels corresponded to fish kills of at least 10 fish (Ponds A3W, A5, A7, A11, A12, A16, and A17). Observations of fish mortality in Ponds A16 and A17 occurred prior to the Phase 1 modifications to those ponds. In the Eden Landing complex, there are no known reports of fish mortality since implementation of the ISP.

75. ***USFWS - Adaptive Management.*** All of the discharge ponds in the Alviso System have, at times, failed to meet the dissolved oxygen limitation prescribed in Order No. R2-2004-0018 at the discharge point. However, the most severe impacts (fish mortality) from low dissolved oxygen have occurred within Ponds A1, A5, A7, and A16. In each of these cases, USFWS was implementing a corrective measure to improve dissolved oxygen levels at the discharge point (i.e., muted tidal flows or discharge timing) that would result in reduced circulation patterns within ponds, and therefore, lower within-pond dissolved oxygen levels. To provide a better balance between within-pond water quality and receiving water quality, in 2008, USFWS began operating all of its ponds under directional flow to maximize flow through. This operation is intended to reduce stagnant areas in the back portion of ponds, and, therefore, reduce the likelihood of fish mortality.

76. ***USFWS - Altering Managed Ponds.*** By operating ponds to minimize the impact of low dissolved oxygen levels on beneficial uses (i.e., balancing within-pond water quality with receiving water quality), USFWS recognizes that simple operational changes will not significantly improve discharge water quality with respect to dissolved oxygen. In other words, future adaptive management changes will likely be aimed at altering pond geometry, changing residence times, and/or water depths. To determine how former salt ponds should be modified in the long term, USFWS has implemented applied studies at Ponds A3W, A14, and A16 (See Finding 112).

77. ***CDFW - Adaptive Management***. While CDFW has experienced low dissolved oxygen levels in former salt ponds, the effect of low dissolved oxygen does not appear to be as significant as that experienced in the Alviso complex. This is because ponds in the Eden Landing complex are at higher elevations, have trouble taking in waters during the summer months, and therefore, are often operated as seasonal ponds. In other words, many of the CDFW ponds do not have much water in the summer months when maintaining adequate dissolved oxygen levels is most problematic. To minimize the effect of pond discharges on receiving waters, CDFW plans to continue operating ISP ponds under muted tidal conditions. In its larger systems (E8A and E2/E2C), CDFW increases pond turnover rates, and thereby optimizes within-pond water quality (in its intake ponds) by routing water from intake ponds to seasonal ponds.

78. ***CDFW – Altering Managed Ponds***. While there has been no reported fish mortality in the Eden Landing Ponds, CDFW has not shown that managed ponds, as currently designed, are ecologically sustainable. This is because dissolved oxygen levels within ponds do not always comply with Basin Plan objectives. For this reason, CDFW implemented an applied study at Pond E10. A report on this applied study was submitted to the Water Board in 2009, as part of the annual self-monitoring report for Eden Landing (see http://www.southbayrestoration.org/monitoring/2009%20ASMR-KRAUSE031610.pdf).

79. ***Regulation of Dissolved Oxygen.*** The Basin Plan's water quality objective for dissolved oxygen is 5.0 mg/L. However, during the implementation of Order No. R2-2004-0018, the Water Board recognized that, without the installation of aerators, it

would not be feasible for a well-operated lagoon system to meet an instantaneous dissolved oxygen limitation of 5.0 mg/L. Additionally, it has been noted that sloughs in the South Bay often do not meet the Basin Plan objective of 5.0 mg/L. For this reason, the Discharger has been implementing best management practices if dissolved oxygen levels fall below a 10^{th} percentile of 3.3 mg/L (calculated on a weekly basis) at the point of discharge. This dissolved oxygen trigger was based on levels found in Artesian Slough near Heron Rookery in July 1997. These values are the most relevant representation of natural dissolved oxygen variations in sloughs or lagoon systems currently available. Even using this trigger value as a threshold, the Discharger repeatedly has been implementing corrective measures (e.g., discharge timing, muted tidal flows, and installing baffles) to address low dissolved oxygen levels in pond discharges. In order to improve dissolved oxygen levels in former salt ponds, the Discharger will likely need to implement corrective measures aimed at significantly reducing residence times and/or altering pond geometry.

80. ***Applied Studies.*** To address how the Discharger needs to adaptively manage ponds in the long term, this Order requires that the Discharger continue to implement applied studies. These studies will focus on ponds that may be operated as managed ponds in the long term (e.g., A3W, A14, and E10) and ponds that will be reconfigured (SF2 and A16/A17) under Phase 1 restoration actions (Note: Pond A17 was converted from a managed pond to a tidal pond in Modification 1 to Phase 1). The purpose of these applied studies is to guide long-term restoration efforts to determine (a) how pond geometry (surface area, depth, filling borrow ditches) should be altered to make managed ponds ecologically sustainable, (b) if the Discharger should move towards a restoration effort that will involve fewer managed ponds and more tidal marsh (especially if managed ponds cannot be reconfigured to become ecologically sustainable), and (c) how to develop a site-specific objective for dissolved oxygen in managed ponds. References to completed studies are provided in Finding 112.

IV. On-Going Pond Operation & Maintenance

81. On-going maintenance for those ponds that were not specifically modified as a part of Phase 1 or will not be modified by Phase 2 is also a critical element of the project. On-going operations and maintenance of all ponds in the SBSPRP area is included in this Order. Lack of maintenance to the existing levees and water control structures could have flood management and water quality implications if uncontrolled breaches are allowed to happen. The goal of these activities is to maintain the current level of maintenance in order to protect the existing infrastructure and neighboring communities, until specific restoration actions are carefully planned and implemented in subsequent project phases.

82. Waterbodies affected by ongoing operations and maintenance of ponds will include (see Figure 1):

    - Eden Landing: Alameda Flood Control Channel, Old Alameda Creek, Mt. Eden Creek, and North Creek (Adjacent Ponds: E1, E1C, E2, E2C, E4, E4C, E5, E5C, E6, E6A, E6B, E6C, E7, E8, E8A, E8X, E9, E10, E11, E12, E13, and E14).

- Ravenswood: Lower South San Francisco Bay and Ravenswood Slough (Adjacent Ponds: R1, R2, R3, R4, R5, S5, and SF2).

- Alviso: Lower South San Francisco Bay, Alviso Slough, Guadalupe Slough, Coyote Creek, Mud Slough, and Artesian Slough (Adjacent Ponds: A1, A2W, AB1, A2E, AB2, A3W, A3N, A5, A6, A7, A8, A8S, A9, A10, A11, A12, A13, A14, A15, A16, A17, A19, A20, A21, A22, and A23).

83. Operations, management, and maintenance activities will be performed periodically for all Project facilities, including reconfigured and managed ponds, recreational/public access facilities, and (less frequently) tidal habitat restorations. These operations, management, and maintenance activities are currently being performed in a manner described in the Biological Opinion issued to Cargill (5 July 1995; Reference #1-1-95-F-47). The Discharger has already undertaken the responsibilities for operations, management, and maintenance activities as part of the SBSPRP. Levees, ponds, and water control structures will be routinely operated and maintained according to a protocol outlined in the 2008 USFWS and 2009 NMFS Biological Opinions and respective amendments. The USFWS and NMFS Biological Opinions were most recently amended on November 21, 2017 (USFWS, Reference No. 08FBDT00-2017-F-0109-2) and on [TBD] (NMFS Ref. No. [TBD]). Additional operations, management, and maintenance activities are described in Provision E.43.

84. Portable pumps, such as diesel-powered pumps, may be used occasionally for operations and maintenance activities, such as supplementing gravity flows through water control structures or dewatering cells or canals for maintenance.

Laws, Regulations, and Policies

85. Basin Plan: The Porter-Cologne Water Quality Control Act (Water Code sections 13000-16104) authorizes the Water Board to develop a Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) which is the Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Water Board and approved by the State Water Resources Control Board, U.S. EPA, and the Office of Administrative Law where required. The latest version can be found at the Water Board's website at http://www.waterboards.ca.gov/sanfranciscobay/basin_planning.shtml

86. The Basin Plan includes the following Beneficial Uses for the San Francisco Bay, Santa Clara Basin, South Bay Basin, and Lower San Francisco Bay. Because the salt ponds are hydrologically connected to San Francisco Bay, these beneficial uses also apply to the salt ponds:

    - Ocean, Commercial, and Sport Fishing (COMM)
    - Estuarine Habitat (EST)
    - Industrial Service Supply (IND)

- Fish Migration (MIG)
- Navigation (NAV)
- Preservation of Rare and Endangered Species (RARE)
- Water Contact Recreation (REC-1)
- Noncontact Water Recreation (REC-2)
- Shellfish Harvesting (SHELL)
- Fish Spawning (SPWN)
- Wildlife Habitat (WILD)

87. This project is consistent with the goals of the following components of the State Wetlands Policy: California Wetlands Conservation Policy (Executive Order W-59-93, signed August 23, 1993), which is incorporated in the Basin Plan, that includes ensuring "no overall loss" and achieving a "…long-term net gain in the quantity, quality, and permanence of wetland acreages and values…." Senate Concurrent Resolution No. 28 states that "it 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 California Water Code (CWC) requires that the "[h]ighest priority shall be given to improving or eliminating discharges that adversely affect …wetlands, estuaries, and other biologically sensitive areas."

88. The San Francisco *Baylands Ecosystem Habitat Goals* and the *Comprehensive Conservation and Management Plan* (referred to in Finding 13) are regional plans that support the restoration of San Francisco Bay salt ponds to tidal marsh. The *USFWS Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Recovery Plan) (USFWS, August 27, 2013), which include recovery actions for the Ridgway's rail and salt marsh harvest mouse (SMHM), supports both the restoration of as many acres of tidal marsh as feasible and the creation of habitat transition zones (i.e., ecotones) between marsh habitats and upland high water refuges. The Phase 2 SBSPRP is consistent with the recommendations in the two reports and the Recovery Plan.

89. Sediment Quality. The State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries Part 1, Sediment Quality on September 16, 2008, and it became effective on August 25, 2009. This plan supersedes other narrative sediment quality objectives and establishes new sediment quality objectives and related implementation provisions for specifically defined sediments in most bays and estuaries. This Order implements the sediment quality objectives of this plan for both the existing and proposed discharges.

90. State Water Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California" (Antidegradation Policy), states that discharges to existing high quality waters will be required to meet WDRs that will result in the best practicable treatment or control of the discharge necessary to assure that (a) a condition of pollution or nuisance will not occur, and (b) the highest water quality consistent with maximum benefit to the people of the State will be

maintained. These WDRs are consistent with Resolution No. 68-16 because implementation of the proposed restoration expected to enhance the existing beneficial uses of the waters of the State and achieve potential beneficial uses. Restoration is ultimately expected to improve water quality and fish habitat in the former salt ponds. The temporary impacts to water quality associated with restoration-related construction are minimized due to phased implementation (as explained in Findings 26 to 38, above) and are consistent with the maximum benefit to the people of the state because they will restore or enhance critically important wildlife habitat and recreation opportunities, and will protect infrastructure and residences from the effects of sea level rise.

91. The following California- and federally-listed species and designated critical habitat are present at the project location:
(a)Delta smelt (*Hypomesus transpacificus*);
(b)Longfin smelt (*Spirinchus thaleichthys*);
(c)Green sturgeon (*Acipenser medirostris*);
(d) Ridgway's Rail (*Rallus longirostris obsoletus);*
(e) the threatened Pacific coast population of the western snowy plover (*Charadrius alexandrines nivosus*);
(f) Steelhead trout, central California coast evolutionarily significant unit (ESU) (*Oncorhynchus mykiss*);
(g)Chinook salmon, Central Valley(Sacramento) spring-run (*Oncorhynchus tshawytscha*).

92. 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 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 the waters of the State referenced in Table 2 and Finding 82, above.

93. Wetland Tracker: It has been determined through regional, State, and national studies that tracking wetland mitigation/restoration projects must be improved to better assess the performance of these projects, following monitoring periods that last several years. In addition, to effectively carry out the State's No Net Loss Policy for wetlands, the Water Board and State Water Board need to closely track both losses and mitigation/restoration project success. Therefore, the Water Board requires that the Discharger use a standard form to provide Project information related to impacts and mitigation/restoration measures. An electronic copy of the form and instructions can be downloaded at http://www.waterboards.ca.gov/sanfranciscobay/certs/shtml. Project information concerning impacts and mitigation/restoration will be made available at the web link: http://www.californiawetlands.net.

94. 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 Comprehensive Conservation and Management Plan (CCMP), updated as the Estuary Blueprint in 2016 (San Francisco Estuary Partnership, 2016). Phase 2 monitoring and monitoring for future Project phases may be conducted collaboratively through a Wetlands RMP.

95. 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 Regional 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 Regional 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.

96. California Wetlands Conservation Policy. Requirements of this Order implement the 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...."

97. 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 Regional 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).

CEQA Findings

98. CEQA requires that the effects of all discretionary projects authorized by public agencies to be analyzed to prevent significant avoidable impacts and to reduce or mitigate unavoidable impacts to the environment. All projects approved by State

agencies must be in full compliance with CEQA. CDFW, as lead agency together with USFWS, certified a final environmental impact statement/report (EIS/R) for Programmatic Analysis of the SBSPRP and Project-Specific Analysis of Phase 1 of the SBSPRP (2007 EIS/R) (State Clearinghouse Number 2004114003) on March 11, 2008. For Phase 2, CDFW and USFWS prepared the *South Bay Salt Pond Restoration Phase 2 Project, Environmental Impact Statement / Report* (State Clearinghouse No. 2013092010) (Phase 2 EIS/R). CDFW, as lead agency together with USFWS, certified a final environmental impact statement/report (EIS/R) for Phase 2 on May 27, 2016, that has been considered and relied upon in preparation of the Order. The Water Board, as a responsible agency under CEQA, finds that all environmental effects have been identified for project activities that it is required to approve, and that those proposed project activities, as conditioned and with Monitoring (Attachments D and E) and Adaptive Management (Attachment C), will not have significant adverse impacts on the environment. The lead agency's CEQA Findings are presented below (Findings 99-110).

99. The Environmental Impact Statement/Report (EIS/R) prepared for the SBSPRP (State Clearinghouse Number 2004114003) included both programmatic level and Phase 1 specific impact analysis. Over a 50-year period, the 2007 EIS/R found that the benefits from the overall SBSPRP and Phase 1 projects outweighed adverse environmental impacts, after mitigation and incorporating adaptive management, is taken into account. No mitigation measures were deemed necessary for the potential impacts to hydrology and flood management; geology, soils and seismicity; or biological resources -- all of which were considered to be less than significant or beneficial. The Phase 2 EIS/R concluded that additional fill activities associated with creating habitat transition zones would have a net beneficial impact. The conditions and monitoring required in this Order will substantially lessen the temporary impacts and disruption associated with project construction, and implementation of this Order will result in the creation of significant transition zone habitat. The baseline conditions for the 2016 Phase 2 EIR/R were different from the 2007 EIS/R. In the 2007 EIS/R, the Programmatic No Action Alternative assumed not doing the program-level project also meant that the Adaptive Management Plan (AMP) (See Attachment C and Findings 111 - 113) would not be implemented. A program-level Action Alternative was selected and is being implemented; that alternative included the AMP. Therefore, for the purposes of the 2016 Phase 2 CEQA analysis, the assumption was that the Dischargers will continue to implement the AMP measures that maintain water quality. Because of this, some of the Phase 2 project-level significance determinations for the No Action Alternatives are different in the 2016 Phase 2 EIR/S than they were in the 2007 EIR/S.

100. The SBSPRP will be implemented in a series of phases over many years, on the order of decades. Each phase will have its own project level CEQA documentation that will tier off of the programmatic EIS/R approved by CDFW and USFWS. Subsequent phases of the SBSPRP are not covered by these WDRs.

101. Potential water quality impacts in Phase 2 were found to be less than significant (See Table 19). No mitigation measures were required in the Phase 2 EIR/S, because

implementation of the AMP is part of the Phase 2 baseline condition. The potential impacts are numbered coincident with the 2016 Phase 2 EIS/R (State Clearinghouse No. 2013092010) where a full impact analysis is provided.

Table 19. Potential Impacts to Water and Sediment Quality Identified in the 2016 Phase 2 EIS/R

POTENTIAL IMPACT	LEVEL OF SIGNIFICANCE
Impact 3.3-1: Degradation of water quality due to changes in algal abundance or composition.	Less than Significant Impact
Impact 3.3-2: Degradation of water quality due to low DO levels.	Less than Significant Impact
Impact 3.3-3: Degradation of water quality due to Potential to increased methylmercury production or mobilization of mercury-contaminated sediments.	Less than Significant Impact
Impact 3.3-4: Potential impacts to water quality from other contaminants.	Less than Significant Impact
Impact 3.3-5: Potential to cause seawater intrusion of regional groundwater sources.	Less than Significant Impact

Water Quality Issues Under CEQA

102. As stated in Findings 54, 54, 70, 73, 74, 75, 76, 77, and 79, the interim management phase has posed challenges for water quality, particularly dissolved oxygen, due to algae proliferation in the ponds when the days get longer and hotter. In order to provide water quality and ecosystem benefit to offset potential low dissolved oxygen conditions associated with lagoon management, the Discharger must minimize the time-period of operating former salt ponds as managed ponds as they are currently configured.

i) *Mercury Methylation*

103. Mercury occurs naturally in the San Francisco Bay environment and has been introduced as a contaminant in various chemical forms from a variety of anthropogenic sources. Ambient levels of sediments in San Francisco Bay are elevated in total mercury above naturally occurring background levels. Although mercury often resides in forms that are not hazardous, it can be transformed through natural processes into toxic methylmercury. Natural accretion processes in salt marshes continually supply fresh layers of mercury-contaminated sediments that release mercury in a form that can become biologically available to mercury-methylating bacteria and subsequently bioaccumulate in the food chain. The resulting concentration of methylmercury is dependent on numerous variables, including: redox potential, salinity, pH, vegetation, sulfur (including sulfate derived from

gypsum layers in pond bottoms), dissolved organic carbon, nitrogen, and seasonal variations in each of the identified variables.

104. The Water Board's Basin Plan, which includes a TMDL for mercury,[2] states that wetlands may contribute substantially to methylmercury production and subsequent biological exposure to mercury within the Bay. Wetland restoration projects can, therefore, increase levels of methylmercury, and monitoring is a useful tool to evaluate whether this is occurring, and can inform management decisions regarding what types of restoration discourage methylmercury production. Natural sedimentation occurring via sediments brought in by the tides and creeks may also provide a source of mercury that may be methylated in the SBSPRP.

105. Sediments in the Alviso pond complex have considerably higher mercury concentrations than Bay sediments (i.e., about 2 to 10 times the ambient Bay concentration). These concentrations are due to the mercury load that historically entered the Project Area from the Guadalupe River watershed. Breaching levees in this complex has the potential to generate increased levels of methylmercury. The Discharger minimizes increases in methylmercury by monitoring and by implementing its Adaptive Management Plan (see Findings 111 - 113 and Provisions E.8-E.10).

106. The South Baylands Mercury Project (SBMP), commissioned by the Discharger, gathered baseline data on mercury in biota and characterized methylmercury in the Alviso Slough area, including Alviso Pond A8. One of the main purposes of this Phase 1 action was to assess any significant changes in methylmercury bioaccumulation in and around Pond A8 as a result of the action. Biosentinel species included brine flies, fish, and resident marsh birds. Sediment and water mercury and additional chemical data were also gathered to provide further insight into expected conditions after Phase 1 actions. Analyses of data collected as part of the SBMP in 2006 and 2007, and additional samples collected in April and May 2008, are summarized in the *South Baylands Mercury Project, Final Report* (Letitia Grenier, et. al., February 10, 2010). This Report recommended restoring Pond A8 to tidal action, while also recommending ongoing monitoring of methyl mercury in the food webs of fish and wildlife in the South Bay (The Report is available at http://www.southbayrestoration.org/documents/south-baylands-mercury/SBMP_Final%20Report%2010FEB2010.pdf).

ii) *Other Contaminants.*

107. The proposed alternatives (see Finding 4) for the SBSPRP have the potential to affect water and sediment quality with various constituents other than mercury, methylmercury, nutrients, algae, salinity, and DO. The primary mechanisms that could impair water and sediment quality by introducing these other contaminants include: construction-related activities, maintenance activities, excavating channels, intrusion of selenium from adjacent aquifers, illegal discharges and dumping,

[2] http://www.waterboards.ca.gov/sanfranciscobay/basin_planning.shtml

increased mobilization and transport of particle-associated contaminants, unplanned levee breaching/failure, surface water contamination from groundwater, increased interaction with urban runoff, and bacterial regrowth in the restored areas.

iii*) Other Water Quality Issues*

108. Mosquito abatement: Of the wetland habitats in the project areas, only transitional habitat transition zones and seasonal wetlands are considered to have the potential to produce problem numbers of mosquitoes. The SBSPRP is in the jurisdiction of Alameda, Santa Clara, and San Mateo County mosquito abatement districts. The Discharger is coordinating with those districts during design, implementation, and operation phases of the project to mitigate for any increases in potential mosquito breeding habitat.

109. Bay Mud: If fine-grained dredged material (Bay Mud) is allowed to dry out on the surface, the following adverse effects on wetland environments can occur: it can harden, which makes it a poor substrate for wetland biota; it can develop deep cracks that harbor mosquitoes; and it can cause metals, including mercury, to become soluble, thereby increasing their potential to leach out when the site is re-flooded. Therefore, this Order requires that the Discharger ensure that imported dredged material placed into ponds is kept wet (see Provision E.42).

110. Invasive Cordgrass was inadvertently introduced into San Francisco Bay tidal marshes in the 1970's (predominantly *Spartina alterniflora* and *S. densiflora)* and threatens the existence of the native cordgrass (*S. foliosa*) upon which many tidal marsh species depend. To mitigate for potential impacts from cordgrass, the Discharger is cooperating with the Invasive Spartina Project to eradicate invasive cordgrass and protect the native tidal marsh species (see Provisions E.9 and E.18). In particular, the Discharger collaborated with the Invasive Spartina Project to identify the following "Best Practices" which have been incorporated into the Project:

a. No Spartina is proposed to be planted in the Project Area. If circumstances arise where Spartina will be planted in the Project Area, the plantings will be genetically verified to be Spartina foliosa.

b. The Project Area should be monitored annually for the presence of non-native or hybrid Spartina. In addition to field identification, representative samples of any found Spartina should be genetically analyzed to verify absence of S. alterniflora or S. densiflora genetic markers. Any found non-native or hybrid Spartina plants should be removed or killed before their first season of flowering and seed set.

c. One measure of the Project's success in achieving the Project Objective regarding management of "the spread of non-native invasive species" is that there is no non-native or hybrid Spartina found in the Project Area.

d. The Project will not initiate connection of ponds with tidal flows (full or muted) at locations where S. alterniflora or S. alterniflora x S. foliosa seed or propagules are likely to get into the Project Area.

e. The Project will take care to not introduce non-native Spartina seed or propagules into the Project Area on contaminated excavators, dredges, or other equipment. The Project will require that all equipment be cleaned prior to entry into an intertidal part of the Project Area if it has been in contact with non-native Spartina plants, seeds, or roots.

f. The Project will make sure that any dredged materials brought to the Project Area do not contain non-native Spartina seed or fragments.

g. Variations to the above best practices may be appropriate, based on site-specific conditions and scientific analysis. Proposed variations should be developed with assistance or review from the Invasive Spartina Project. Additionally, the Project will discuss any proposed variations with nearby marsh owners/managers, who could be affected by the actions of the Project.

Adaptive Management Plan (AMP)

111. Adaptive management, as described in the AMP in Attachment C, is an integral component of the SBSPRP. The loop between science and management (while keeping the public informed) is designed to occur at every phase during adaptive management, which results in a stepwise conversion (known as a "staircase") of habitats from ponds to tidal habitats. Additional feedback loops may occur that require modification to pond management between successive phases of additional tidal restoration. Avoidance of impacts will be completed through a combination of adaptive management and mitigation measures. The term "staircase issue" is used to describe environmental considerations that would have an effect on the Discharger's decision making with regard to progress along the tidal habitat restoration "staircase" towards the 50:50 mix of tidal and managed pond habitats and potentially to a 90:10 mix of habitats as described in Finding 4. To ensure that significant impacts to water quality are avoided while progressing with conversion of habitat types, triggers for adaptive management actions will be established well below the thresholds of significance used to analyze impacts to water quality parameters (defined in Section 3.3 of the 2016 EIS/R).

112. The Phase 1 actions provided the opportunity to address specific uncertainties about how the South Bay ecosystems may respond to restoration actions, through applied studies as described in the AMP. Specifically, these studies tracked and evaluated the breakup of hardened gypsum layers for marsh restoration, the creation of bird nesting and roosting islands, mercury mobilization through sediment accretion and methylation, and variations in salinity gradients. The results of the applied studies and small- and large- scale response monitoring associated with Phase 1 provided information for Phase 2. Similarly, information gained in implementing Phase 2 will inform future restoration phases. Other staircase issues include sediment dynamics,

bird use of changing habitats, effects on non-avian species, effects on invasive and nuisance species, public access and wildlife, and social dynamics. The results of Phase 1 applied studies are available on the SBSPRP's website at:

- http://www.southbayrestoration.org/documents/technical/Kuwabara_Pond%20A3W_of2013-1128_text.pdf
- http://www.southbayrestoration.org/documents/technical/BOD%20Report_Brent%20Topping_OFR_2009-1180.pdf
- http://www.southbayrestoration.org/pdf_files/USGS%20Report%202008%E2%80%931097.pdf

Additional details of water quality and pond management are included in the annual self-monitoring reports for the Project. These reports are available at:

- http://www.southbayrestoration.org/monitoring/

Phase 2 actions will also include the monitoring of created habitat transition zones. Information on these issues and the process for adaptive management is presented in the attached AMP and the March 2018 Addendum to the AMP. To establish that the habitat transition zones create sufficient habitat benefits to compensate for significant fill associated with implementing Phase 2, the monitoring outlined in the March 2018 Addendum to the AMP will track the successful establishment of functioning habitat transition zones and the ongoing stability of flood management levees. This monitoring data should also provide information for adaptive management as future habitat transition zones are designed and constructed. Monitoring data from the restored tidal wetlands and the created habitat transition zones will be used to demonstrate that the habitat benefits provided to listed tidal marsh species and other wildlife have been sufficient to compensate for the fill of waters of the State summarized in Table 4.

113. To ensure that water quality meets objectives in the Basin Plan, the AMP includes potential management actions that are summarized in Table B-8 in Attachment B (ii) and in the table in the March 2018 Addendum to the AMP (See Attachment C). The methods presented in these tables are examples of methods that could be implemented in the adaptive management of the SBSPRP. For the Phase 1 and Phase 2 actions, data will be generated from monitoring and applied studies. The data will be analyzed to determine if the restoration is proceeding towards the defined Project Objectives and if defined triggers have been exceeded, in which case management action needs to be taken.

Monitoring Plans (MPs)

114. Monitoring will ensure that the Project does not cause unintended adverse environmental effects to water, sediment, humans (especially from flooding), wildlife and plants, and that habitat and hydro-geomorphology development is proceeding as expected.

115. Water quality monitoring in Phase 2 is summarized in Finding 9 and monitoring procedures are provided in the attached Self-Monitoring Plan (SMP) (Attachment D). Salinity monitoring will be performed from June through November on a weekly basis at the discharges from Ponds A5, A7, A8, A14, A16, A2W, A3W, SF2, and R5/S5.

116. Other Phase 2 monitoring, including landscape processes, hydrology, habitat, and biological populations, are summarized in Finding 9, the Monitoring Plan (Attachment D), and the March 2018 Addendum to the AMP (Attachment C), which was developed for the monitoring of Habitat Transition Zones.

Western snowy plovers, Ridgway's Rails and salt marsh harvest mice will continue to be monitored in areas of the South Bay Salt Pond Restoration footprint on an annual basis. *Spartina* will continue to be mapped across the SBSPRP area on an annual basis. Studies of mercury in fish, birds and environmental mercury will continued throughout the project in association with activities at Pond A8.

117. To assure that the predicted hydrology and the habitat goals listed in Table 3 are being achieved, criteria described in the MP and summarized in Finding 9 will be tracked, including geomorphic evolution, water quality parameters, biosentinel mercury concentrations, vegetation populations, bird populations, and endangered species populations. Monitoring to track project performance will continue in each of the six Phase 1 pond systems and four Phase 2 pond systems for at least 15 years. No penalties will be imposed for a failure to achieve the interim and final habitat goals, since this is a restoration (not a mitigation) project, but an investigation will be undertaken by the Discharger as part of the SBSPRP Project Management Team. Regulatory agencies will be involved, including the Water Board and BCDC in decision making with the Project's Management Team, and management modifications will be made as necessary to put the project back on a restoration path that will achieve the desired habitats.

118. As stated above in Finding 106, the South Baylands Mercury Project will use the *South Baylands Mercury Project, Final Report* (Letitia Grenier, et. al., February 10, 2010) to develop an ongoing monitoring plan for methyl mercury in the food webs of fish and wildlife in the South Bay.

Management Options for Adaptive Management

Dissolved Oxygen and Algae

119. The Phase 1 and Phase 2 restorations have been designed to minimize high risk factors for poor water quality (i.e., low dissolved oxygen). Design elements, including hydraulic residence time, water depth, and mixing, have been optimized in each Phase 1 and Phase 2 design. As specified in the AMP, monitoring will be necessary to track the algal abundance and water quality in the ponds. The three Phase 1 managed ponds (A16, SF2, and E12/13) were operated with shallower water depths than other ISP managed ponds, which resulted in greater wind driven mixing and re-aeration of

those ponds in Phase 1. In Phase 2, Ponds R5/S5, which are currently seasonal ponds with no connection to the Bay, will be managed for shallow, muted-tidal water. Pond R3, which is currently managed as a seasonal pond, will be managed in Phase 2 for western snowy plover nesting habitat by actively draining it prior to nesting season and periodically refreshing the water in the borrow ditches and slough channels to enhance forage quality. Data from Phase 1 studies of dissolved oxygen levels in these ponds have been analyzed and submitted to the Water Board in the Self-Monitoring reports. For Phase 2, Ponds R5/S5 will be added to the self-monitoring program, as outlined in Finding 9.

120. Increases in algal blooms and decreases in dissolved oxygen (DO) are a potential result of the Phase 1 and Phase 2 actions identified in Finding 107. Phase 1 and Phase 2 risk factors for both algae and DO in any particular pond complex are waters that are deep, slow (long residence times), rich in nutrients, rich in organic matter, subject to calm wind exposure, and highly transparent. Conversely, the lowest risk water bodies would likely be quickly turned over (short residence times), poor in nutrients, poor in organic carbon, windy and opaque. If triggers developed in the Adaptive Management Plan are exceeded in monitored waters as a result of high risk factors, then adaptive management actions will be implemented that convert high risk factors to low risk factors. Examples of such actions include improving water circulation patterns with fill, decreasing hydraulic residence time, increasing exposure to wind, or otherwise increasing the re-aeration rate.

Mercury Methylation

121. Periodic monitoring of biosentinel species and/or sediment and water at the site will be required as outlined in the Adaptive Management Plan, Water Quality Monitoring Plan, and Landscape, Habitat and Biological Species Monitoring Plans (Attachments C, D, and E) after the current mercury studies have been analyzed, to determine if mercury methylation poses a potential problem. If elevated levels of methylmercury are found, the Discharger may be required to investigate ways to design and operate features of the SBSPRP to minimize methylmercury uptake and loads to the Bay; and monitoring may be increased to include water, sediment, and/or additional biosentinel species.

122. Movement of mercury-contaminated sediments is a potential outcome of Phase 1 or Phase 2 actions. Mercury concentrations in Bay sediments increase to the south and, as stated earlier, sediments in the Alviso pond complex have considerably higher mercury concentrations than Bay sediments (i.e., about two to ten times the ambient Bay condition). In the Alviso ponds, breaching levees introduces the risk of transporting mercury-contaminated sediments from Phase 1 and 2 ponds to the Bay. This has the potential to exceed the Bay Mercury Total Maximum Daily Load (TMDL) allocation that is based on a target for mercury in suspended sediments. However, because of historic subsidence and Bay hydrodynamics, essentially all Alviso projects in Phase 1 and Phase 2 would create accretional areas, resulting in a net loss of mercury from the Bay to the SBSPRP area. Therefore, the 2007 EIS/R

concluded that restoring the Alviso ponds may actually benefit biological species by burying mercury and effectively removing it from the system.

123. For both Eden Landing and the Ravenswood ponds, there is a risk that the introduction of Bay ambient sediments could increase mercury bioaccumulation within the SBSPRP Area; however, there is not a significant risk to the regional setting.

124. All pond complexes will be monitored and, if triggers are exceeded in the Adaptive Management plan, then actions will be implemented that avoid significant impacts. Examples of such actions include monitoring to evaluate the bioaccumulation impact of mercury-contaminated sediments, capping sediments in pond bottoms with clean fill, or removing mercury-contaminated sediments. The Phase 1 action at Pond A8 included an adjustable notch that allows for tidal exchange between Alviso Slough and Pond A8. This action could allow accumulation of sediments in Pond A8 that originate more directly from the Guadalupe River watershed. The SBMP mentioned under the Monitoring Program above, which is led by the San Francisco Bay Estuary Institute, is taking the first step in the adaptive management process for this geographic area by defining sentinel species and measuring mercury in those species along Alviso Slough. The Phase 1 action at Pond A8 was designed such that it can be reversed, so that the tidal exchange can be cut off if data indicate that methylmercury production and bioaccumulation are being exacerbated by the tidal exchange. The notch will be operated fully open in Phase 2.

125. The Eden Landing and Ravenswood ponds will have a range of conditions, including accumulations of gypsum on pond bottoms that may release sulfate, which can influence mercury methylation, as well as varying salinities and water depths that will allow the Project to conduct studies to monitor the effects of methylmercury production on different organisms. The AMP can examine the interactive effects of varying salinity and hydraulic residence time on net mercury methylation in the Phase 1 and Phase 2 actions.

Other Water Quality Issues

126. The main impacts from contaminants, other than mercury, nutrients, and algae, are likely to result from construction activities, which may cause accidental spills or leaks and transient increases of turbidity; however, proper inspection of equipment and proper planning can minimize these impacts. Steps are included in the Provisions to assure that construction and other project-related activities avoid and minimize impacts to water quality and existing habitats.

127. Habitat values in the SBSPRP may also be impacted by increased interaction of the restored area with contaminants transported in creeks, including contaminants in the creek associated with the discharge of urban runoff to the creeks.

128. Treatment of the gypsum deposits could mobilize sulfate. The principal risk from released sulfate is the effect of sulfate on mercury methylation, as discussed above.

129. Preliminary results of Philip Williams & Associates (PWA's) hydrodynamic modeling of salinity (EIS/R Appendix J) indicate that seawater will not intrude into regional groundwater sources and that surface water salinity would not increase substantially in the Eden Landing, Alviso, or Ravenswood pond complexes. The project will coordinate with the county water districts (Alameda County Water District and Santa Clara Valley Water District) to prevent groundwater contamination via improperly abandoned wells, thereby reducing potentially significant impacts.

130. Preliminary results of PWA's hydrodynamic modeling results for salinity (EIS/R Appendix J) indicate that salinity would increase approximately 4 ppt at the southeast edge of the SBSPRP Area in the Guadalupe River and Coyote Creek at the end of the 50-year modeling period. Salinity increases will continue up both water bodies for an unknown distance. The increased salinity concentrations may reach as far as the area of the unconfined portion of the Santa Clara Valley Subbasin on Coyote Creek in the vicinity of Milpitas. The increase in salinity is a result of a greater volume of tidal inflow in the Alviso area, as ponds are opened to tidal action. The greater volume is a product of the same tidal range acting over a greater tidal area. The increase in salinity is not a result of saline discharges from the ponds but is rather the new ambient condition as a result of increased tidal prism.

131. The Water Board notified the Discharger and interested agencies and persons of its intent to issue WDRs for the SBSPRP and provided them with an opportunity to submit their written views and recommendations.

132. The Board, in a public hearing on May 9, 2018, heard and considered all comments pertaining to the proposed WDRs for the project.

It is Hereby Ordered pursuant to the provisions of Division 7 of the California Water Code and regulations, and guidelines adopted thereunder, that the Discharger, its agents, successors, and assigns shall comply with the following:

A. PROHIBITIONS

1. Discharges of water, material, or wastes which are not otherwise authorized by the Order are prohibited.

2. 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, except as in compliance with this Order.

3. It is prohibited to import dredged material or upland soils without first following the testing and screening protocols described in Specifications B.1 and B.2, below, and obtaining Water Board staff approval. Movement of on-site material is allowed.

4. Intake from waters of the State into Ponds A9 and A16 between December 1 and April 30 is prohibited. For Pond A16, this prohibition does not apply as long as the fish screen at the Pond A16 intake from Pond A17 is properly operated to exclude anadromous fish.

5. The activities subject to these requirements shall not cause a condition of pollution or nuisance as defined in CWC Sections 13050(i) and (m), respectively.

6. No debris, soil, silt, sand, cement, concrete, or washings thereof, or other construction related materials or wastes, oil or petroleum products or other organic or earthen material shall be allowed to enter into or be placed where it may be washed from the SBSPRP sites by rainfall or runoff into waters of the State. When operations are completed, any excess material shall be removed from the work area and any adjacent area where such material may be washed into waters of the State.

7. Project-related discharges shall not cause a violation of any water quality standard for receiving waters adopted by the Regional Water Board or 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.

B. SPECIFICATIONS

1. Dredged Material Screening Procedures. The Discharger shall submit, acceptable to the Water Board Executive Officer, data characterizing the quality of all dredged material (Bay sediments) proposed for use as fill prior to placement at any of the Phase 1 or subsequent SBSPRP project sites (See Provision E.40). Sediment characterization shall follow the protocols specified in:

   a. The Dredged Materials Management Office (DMMO) guidance document, "Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region" (Corps Public Notice 01-01, or most current version), with the exception that the water column bioassay simulating in-bay unconfined aquatic disposal shall be replaced with the modified effluent elutriate test, as described in Appendix B of the Inland Testing Manual, for both water column toxicity and chemistry (DMMO suite of metals only); and,

   b. Water Board May 2000 staff report, "Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines," or most current revised version.

   Modifications to these procedures may be approved on a case-by-case basis pending the Discharger's ability to demonstrate that the dredged material is unlikely to adversely impact beneficial uses.

2. Imported Upland Soil Screening Procedures: Imported soil from upland borrow sites must be determined to be suitable based on the procedures and screening guidelines contained in *South Bay Salt Pond Quality Assurance Project Plan for Fill Import to Operate and Maintain Levees at Ravenswood and Alviso Salt Pond Complexes* (QAPP) (H.T. Harvey & Associates, January 12, 2017) (See Provision E.41).

3. Appropriate soil erosion measures shall be undertaken and maintained to prevent discharge of sediment to surface waters or surface water drainage courses.

C. EFFLUENT LIMITS

1. All pond waters discharging to the Bay or Sloughs shall meet the following limits:

Constituent	Instantaneous Maximum	Instantaneous Minimum	Units
Salinity	44		ppt
Dissolved Oxygen[1]		5.0	mg/L
pH[2]	8.5	6.5	

[1] This limitation applies when receiving waters contain at least 5.0 mg/L of dissolved oxygen. In cases where receiving waters do not meet the Basin Plan objective, pond discharges must be at or above the dissolved oxygen level in the receiving water.

[2] The Discharger may determine compliance with the pH limitation at the point of discharge or in the receiving water.

2. Pond waters discharging to the Bay or Sloughs shall not exceed the natural temperature of the receiving waters by 20°F, or more.

D. RECEIVING WATER LIMITATIONS

For the following Receiving Water Limitations, the Project Boundary shall be defined as the limit of the receiving waters at mean lower-low water level, which is the topographic contour representing an elevation of 0 ft. NAVD88.

1. The Project activities shall not cause:
   a. Floating, suspended, or deposited macroscopic particulate matter or foam at any place more than 100 feet from the Project Boundary or point of discharge, which persists for longer than 24 hours;
   b. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;
   c. The temperature of any cold or warm freshwater habitat to be increased by more than 5 degrees Fahrenheit above natural receiving water temperature, unless a qualified biologist can demonstrate that such alteration in temperature does not adversely affect beneficial uses;
   d. Visible, floating, suspended, or deposited oil or other products of petroleum origin; and
   e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on wildlife, waterfowl, or other aquatic biota, or which render any of these unfit for human consumption, either at levels created in the receiving waters or as a result of biological concentration.

2. The discharge of pond waters shall not cause the following limits to be exceeded in waters of the State at any one place within 1 foot of the water surface:
   a. Dissolved Oxygen: 5.0 mg/L, minimum
      When natural factors cause lesser concentrations, then these activities shall not cause further reduction in the concentration of dissolved oxygen.

   b. Dissolved Sulfide: 0.1 mg/L, maximum

   c. pH: Variation from normal ambient pH by more than 0.5 pH units

   d. Un-ionized Ammonia: 0.025 mg/L as N, annual median; and
      0.16 mg/L as N, maximum

e. Nutrients: 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.

3. Turbidity of the waters of the State, at any place more than 100 feet from the Project Boundary or point of discharge, shall not increase by more than the following for more than 24 hours, to the extent practical:

Receiving Waters Background	**Incremental Increase**
< 50 NTU	5 NTU maximum
≥ 50 NTU	10% of background, maximum

4. The discharge shall not cause a violation of any particular water quality standard for receiving waters adopted by the Water Board or the State Water Board as required by both the State's Porter-Cologne Water Quality Control Act and the federal Clean Water Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Clean Water Act, or amendments thereto, the Water Board will revise and modify this Order in accordance with such more stringent standards.

E. PROVISIONS

1) **Order Compliance and Rescission of Previous Waste Discharge Requirements:** Requirements prescribed by this Order supersede the requirements prescribed by Order Nos. R2-2008-0078 and R2-2012-0014. Order Nos. R2-2008-0078 and R2-2012-0014 are hereby rescinded upon the effective date of this Order, except for purposes of enforcement.

2) **Operations Plan and Adaptive Management.** The Discharger shall continue to implement its Operations Plan for each pond system to ensure the minimization of impacts to beneficial uses from managed ponds. The Discharger shall submit a plan, acceptable to the Executive Officer, that shall describe operational constraints pertinent to each system, and indicate corrective measures available to the Discharger, as outlined in the Adaptive Management Table (Attachment B(ii), Table B-8), if discharge limits may be violated (e.g., salinity, dissolved oxygen, pH). The Discharger shall update each Operations Plan **annually** (as necessary) to reflect any necessary modifications (e.g., increased flow-through) needed to protect water quality and wildlife. The Operations Plan shall also address avian botulism control, mercury methylation and inorganic salt mobilization. To document avian botulism control efforts, the Discharger shall monitor the salt ponds and nearby receiving waters for the presence of avian botulism, and control outbreaks through the prompt collection and disposal of sick and dead vertebrates. To demonstrate that managed pond systems are operated to minimize conditions that could mobilize inorganics and/or the methylation of mercury, the Discharger should describe how it manages water levels

within each pond system and recommend corrective measures if data show it is enhancing inorganic salt mobilization and/or methylation of mercury. Each Operations Plan is subject to the written approval of the Executive Officer.
Due Date: Annually by March 1 of each year.

3) **Ravenswood Ponds.** Prior to discharging saline waters from the Ravenswood Ponds (with the exception of SF2), the Discharger shall submit a technical report that evaluates the potential for (a) discharges to increase the concentration of salinity and/or metals in receiving waters during the initial release and continuous circulation period, and (b) salinity to cause significant impacts to Ravenswood or Flood Slough during the continuous circulation period. Additionally, the Discharger's technical report shall include a proposal to add these ponds to the Self-Monitoring Program. This technical report is subject to the written approval of the Executive Officer.

4) **Ecological Sustainability of Managed Ponds.** For long-term managed ponds and for those managed under Phase 1 and Phase 2 actions (i.e., SF-2, A16, R1, R2, R3, R5/S5, E12, and E13), the Discharger shall show how ponds will be managed to improve compliance with Basin Plan water quality objectives, in particular, for dissolved oxygen. The Discharger shall submit an annual report **by March 1 of each year** that documents its efforts towards improving water quality within managed ponds. This Report shall evaluate monitoring data collected under the Applied Studies section of the Self-Monitoring Program and recommend: (a) modifications to the geometry of managed ponds (surface area, filling borrow ditches, levees, inlet and outlet structures) to improve dissolved oxygen levels; (b) if the Discharger should move more aggressively to restore a pond system to tidal action and/or increase the acreage of ponds that will be restored to tidal because of the water quality impacts associated with managed ponds; and (c) data collection requirements necessary to provide a framework for developing a site-specific objective for dissolved oxygen in managed ponds.
Due Date: Annually by March 1 of each year.

5) All required reports and documents submitted after Board approval of this Order are subject to Executive Officer approval.

Monitoring and Reporting

6) **Standard Provisions and Reporting Requirements.** The Discharger shall comply with all applicable items of the Standard Provisions and Reporting Requirements for NON-NPDES Wastewater Discharge Permits, August 1993 (Attachment F), or any amendments thereafter with the exception of General Provisions A.4, A.5, and A.10; Treatment Reliability B.2 and B.3; and General Reporting Requirements C.5, as these requirements are not relevant to this project. Where provisions or reporting requirements specified in this Order are different from equivalent or related provisions or reporting requirements given in 'Standard Provisions,' the specifications of this Order shall apply.

7) **Water Quality Self-Monitoring Plan**: The Discharger shall comply with the Water Quality Self-Monitoring Program (SMP) dealing predominantly, but not exclusively, with water quality for this Order as adopted by the Board (Attachment D) to implement the monitoring summarized in Finding 8. The Discharger shall submit an annual Self-Monitoring Report (SMR) **by March 1 of each year**. The SMP may be amended by the Executive Officer in response to a written request by the Discharger, or as necessary to assure collection of information to demonstrate compliance with this Order. The Discharger shall report on activities required in Provisions E.8 through E.15.

   By September 30, 2018, the Discharger shall prepare and submit an addendum to Attachment D, *Water Quality Self-Monitoring Program*. The addendum shall contain the following information:

   - A list of monitoring activities that were unique to Phase 1 and will not be implemented in Phase 2.
   - The names and completion dates of monitoring reports completed in Phase 1 in response to requirements in Attachment D, along with web addresses at which those reports are available, or electronic copies of the reports.
   - A list of the monitoring activities described in Attachment D that will be implemented in Phase 2.

8) **Landscape, Habitat, and Biological Species Monitoring Plan:** To show progress toward achieving target habitats, monitoring is required. Specific methods, locations, and sampling procedures for the Phase 1 and Phase 2 SBSPRP projects are provided in the Phase I Landscape, Habitat, and Biological Species Monitoring Plan (Attachment E – *South Bay Salt Pond Restoration Project Phase 1 Monitoring Plan*, H.T. Harvey & Associates, October 14, 2008) and the Adaptive Management Plan and its March 2018 Addendum (Attachment C), all of which can be amended with written Executive Officer approval, subsequent to the issuance of the Biological Opinions. The Adaptive Management Plan and Addendum present possible future studies and some general methods. The Monitoring Plans include:

   (a) target habitat goals for the nine Phase 1 areas (A6, A8, A16, A17, SF2, E8A, E8X, E9, E12, and E13);

   (b) target habitat goals for the nine Phase 2 areas of USFWS property: A1–tidal marsh habitat, A2W–tidal marsh habitat, A8/A8S-enhanced managed pond habitat (deep water muted tidal ponds), A19–tidal marsh habitat, A20–tidal marsh habitat, R3-enhanced managed pond habitat (dried seasonally for western snowy plover), R4–tidal marsh habitat, R5-enhanced managed pond habitat (shallow water pond for dabbling ducks and small shorebirds), S5-enhanced managed pond habitat (shallow water pond for dabbling ducks and small shorebirds); and

   (c) parameters to be monitored, including detailed procedures and locations for assuring that the beneficial uses of water and habitat will be protected and/or improved.

(d) parameters to be monitored to ensure that created habitat transition zones are stable and vegetated sufficiently to provide a net habitat enhancement for endangered tidal marsh species: Ridgway's rail (*Rallus longirostris obsoletus*), salt marsh harvest mouse (*Reithrodontomys raviventris*), *Cirsium hydrophilum* var. *hydrophilum* (Suisun thistle), *Chloropyron molle* ssp. *molle* (soft bird's-beak), and *Suaeda californica* (California sea-blite).

By September 30, 2018, the Discharger shall prepare and submit addenda to Attachment C, *Adaptive Management Plan*, and Attachment E, *(Draft) Landscape, Habitat, and Biological Species Monitoring Plan*. The addendum to each Attachment shall contain the following information:

- A list of monitoring activities that were unique to Phase 1 and will not be implemented in Phase 2.
- The names and completion dates of monitoring reports completed in Phase 1 in response to requirements in Attachments C and E, along with web addresses at which those reports are available or electronic copies of the reports.
- A list of the monitoring activities described in Attachments C and E that will be implemented in Phase 2.

9) The Landscape, Habitat, and Biological Species Monitoring Plan includes the following: water and sediment quality; mercury monitoring of biosentinel species in accordance with the South Baylands Mercury Project or other regional program, or mercury in water and sediment; landscape mapping; physical and/or hydrogeomorphic development (i.e., channel and marsh development, tidal circulation, habitat transition zone stability and vegetation); vegetation mapping; highly invasive (detrimental) species which should include plants and introduced predators; specific target species monitored (typically endangered species) or groups such as birds, fish, mammals.

10) Mercury Monitoring: Analysis of mercury data collected from the South Baylands Mercury Project and other South Bay projects will be used to determine appropriate triggers to implement activities within the context of the Adaptive Management Plan (Attachment C) to prevent increases in methylmercury production and bioaccumulation. If triggers are exceeded, then adaptive management actions will be implemented to avoid significant impacts. Triggers and actions will be subject to Executive Officer approval. The *South Baylands Mercury Project, Final Report* (Letitia Grenier, et al., February 10, 2010) was completed in early 2010. The Report is available at http://www.southbayrestoration.org/documents/south-baylands-mercury/SBMP_Final%20Report%2010FEB2010.pdf.

11) SBSPRP Phase 1 and Phase 2 projects: The Discharger shall be responsible for submitting biennial monitoring reports (every other year) with biennial memos in the intervening years. The monitoring periods shall cover 15 years for each phase beginning after each of the six separate Phase 1 units (A6, A8, A16/A17, SF2,

E8A/E8X/E9, and E12/E13) and the four Phase 2 units (A19, A20, A21, A8, A8S, A1, A2W, R3, R4, R5, and S5) have been constructed and restoration initiated. The biennial monitoring reports shall: (i) analyze all physical and biological data collected to date, and contain appropriate figures, graphs, and photos; (ii) assess progress toward target habitats; (iii) provide status updates on the Applied Studies proposal process designed to provide information on wildlife habitats; potential flood hazards; and recreational impacts; and (iv) make recommendations for future monitoring and assessment. The biennial memos shall notify the Water Board of any sampling occurring during that period and any problems, and shall provide appropriate photos. For each project, monitoring reports shall be due at the end of Year 2, 4, 6, 8, 10, 12, and 14 following each Phase 1 project's implementation and biennial memos shall be due in the intervening years. A final report for each Phase 1 project shall be submitted in Year 15 after implementation of that Project.

12) **Aerial or satellite photos** (such as those available on Google Earth, or IKONOS images using multispectral satellite imagery) shall be reviewed annually for the six Phase 1 units (A6, A8, A16/A17, SF2, E8A/E8X/E9, and E12/E13) and the four Phase 2 units (A19, A20, A21, A8, A8S, A1, A2W, R3, R4, R5, and S5) to ensure that habitat evolution is occurring without any associated significant adverse or unforeseen events, such as excessive scour or erosion, sedimentation, or establishment of highly invasive plants. If necessary, more detailed analysis of aerial or satellite photos shall be conducted every other year to allow measurements of channel widths, vegetation zones, and other important features listed in the Monitoring Plans (Attachments D and E). If habitat targets for Phase 1 actions are not met by the end of the 15-year monitoring periods, the technical advisory committee (see Provision E.13) shall determine whether aerial or satellite photos should continue for a specified period, such as every 5 years, until the target habitats are achieved, or whether the SBSPRP Phase 1 project or SBSPRP Phase 2 Project has successfully provided adequate wetland habitat benefits to justify discontinuing monitoring.

13) A SBSPRP Technical Advisory Committee (TAC) was organized and convened through a public process by the Discharger and includes, at a minimum, representatives from the Water Board, BCDC, California Coastal Conservancy, the Corps, and the National Marine Fisheries Service. The purpose of this committee is to assess progress of the restoration project by reviewing monitoring data, and to suggest adaptive management strategies. Results of the data analysis shall be presented to the TAC annually, or biennially, for discussion and comment. The TAC can include members of the Wetland Monitoring Group of the San Francisco Bay Regional Wetland Monitoring Program, or use that forum for advice and review. The TAC met throughout Phase 1 implementation, and will continue to meet throughout Phase 2 implementation.

14) At the end of the monitoring periods for each of the Phase 1 and Phase 2 projects, the wetland restoration sites and managed ponds shall be assessed for wetland functionality using a method approved by the Executive Officer.

15) The Discharger shall be responsible for all monitoring and reporting requirements at the SBSPRP sites. However, a Wetland Regional Monitoring Program run by the San Francisco Estuary Institute (SFEI) or any other regional entity equipped to take on regional wetland monitoring in the San Francisco Bay Region, may be delegated by the Discharger to carry out some of the obligations for monitoring, analysis, and reporting (See Finding 94).

16) The Discharger shall use the California Wetlands Standard Form to provide SBSPRP Phase 2 project information related to impacts at the restoration and managed pond sites. An electronic copy can be downloaded at http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml. Project information concerning restoration will be made available the web link: http://www.californiawetlands.net.

17) All Monitoring Reports shall be provided to the Water Board in the form of one hard copy and one electronic copy. In the case of large files, the electronic copy shall be sent on a CD or delivered via another medium appropriate to transferring large file sizes and be made accessible on SFEI's Wetland Tracker (http://www.wetlandtracker.org).

18) Aggressive non-native plant species that threaten sensitive native tidal marsh communities, including those listed under Tier I (and to a lesser extent Tier II) of the Water Board's "Invasive Non-Native Plant Species to Avoid in Wetlands Projects in the San Francisco Bay Region" (2006), should be kept off site to the extent feasible. The Discharger should review the Tier I and Tier II lists and discuss with the Water Board staff the species that the Discharger has determined to be feasible to keep off the Phase 1 and Phase 2 project sites. Invasive cordgrass (*Spartina alterniflora*) is a high priority for preclusion from tidal wetlands restoration sites in the Bay Region, and the Discharger shall coordinate efforts with the Invasive Spartina Project to eradicate this species as identified in Finding 110.

19) No later than April 30 of each year, the Discharger shall provide the Executive Officer with a notification report for proposed operation and maintenance activities to be performed during the period between June 1 of the year in which the notification report is submitted to the Water Board and May 31 of the following year. The notification report shall identify the operations and maintenance activities (See Provision E.43) by Pond Complex and individual pond identification numbers. Proposed activities shall be summarized in a table with the following information: the task number assigned to the proposed activities; the ponds involved; a description of the type of activity (e.g., grading, public access, general levee maintenance, riprap); the proposed duration of the activity, the size/scope of each activity; and a short summary of each activity. The notification report shall also include figures illustrating the proposed locations of the maintenance activities.

CEQA Mitigation Measures Required from the 2016 Phase 2 EIR/S by the Lead Agency:

20) There is only one project-level mitigation measure developed for the Phase 2 alternatives. It is described in Section 3.11, Traffic, and it is called Phase 2 Mitigation Measure 3.11-1: Modify Signal Timing. This mitigation measure is not directly related to actions subject to Water Board jurisdiction.

21) Sediments characterization shall follow existing guidance and comply with emerging regulations, as specified in SBSP Mitigation Measure 3.4-5d in the 2007 EIS/R. The Discharger shall characterize contaminant concentrations in sediments whenever activities will involve moving, transporting, or emplacing soils and sediments or exposing older sediments by dredging and excavation, if there is reason to expect that significant contamination is present in these sediments. Existing guidance for the beneficial re-use 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 (See Specification B.1). This guidance may be refined by the State's emerging program of Sediment Quality Objectives. Sediment characterization data shall be used to follow existing guidance and follow emerging regulations for the placement of sediments and other activities that affect the mobilization and transport of sediments. Sediment characterization data shall be used to determine appropriate disposal or beneficial re-use practices for sediments; if this data indicates that tidal scour outside a levee breach could remobilize sediments that are significantly more contaminated than Bay ambient conditions, the Discharger shall consult with Water Board staff regarding other potential required actions. The SBSPRP has developed a QAPP for upland fill import to maintain levees at the Ravenswood and Alviso Complexes (See Specification B.2). In addition, the SBSPRP intends to submit a Phase 2 QAPP, specifically for material from upland sources to construct Phase 2 features such as habitat transition zones, to the Water Board upon receipt of all Phase 2 permits.

Other SBSPRP Operations

22) The Discharger shall conduct periodic inspection and maintenance of restoration features to ensure that the restoration is performing as intended. For example, routine inspection of ditch blocks for unintentional channel bypassing or erosion shall be necessary, particularly following storm events. If bypassing or erosion occurs, maintenance of the ditch block shall be performed to prevent unintended channel formation. The Discharger shall summarize the results of these efforts in its annual report.

23) For managed ponds, water levels and salinity shall be managed by USFWS and CDFW personnel via the adjustment of water intake, outlet, and circulation structures. Periodic inspection and maintenance of restoration infrastructure such as water control structures, managed pond levees and berms, canals, and islands shall be required to ensure that the ponds are operating as intended. Frequent inspection and maintenance of habitat conditions in the ponds, such as water levels and water quality

(including salinity and dissolved oxygen), shall be necessary to ensure that the ponds are providing the appropriate environment for the target species (See the Adaptive Management Plan in Attachment C).

24) Water levels and flows in the reconfigured managed ponds shall be controlled by adjusting the gate settings at culverts and by adding or removing flashboard risers at weirs. Routine monitoring of water levels shall be necessary to ensure that the ponds are providing the appropriate habitat for desired species. Regular monitoring of water quality will also be necessary to ensure that target water quality parameters are met both inside the pond and in discharges. If water levels or water quality targets are not met, changes in the operation of water control structures may be necessary. Periodic maintenance of internal channels and canals (e.g., via excavation), replenishment of islands via excavation and placement of spoils on the islands, vegetation control on islands, and possible predator control shall be needed to ensure that managed ponds are providing desired levels of habitat quality for wildlife.

25) Routine inspection of water control structures in reconfigured managed ponds shall be necessary to ensure that they are functioning properly. Inspection of water control structures and canals for debris or trash obstructions shall be necessary to maintain desired flows. If obstructions are found during inspection, it may be necessary to remove the obstructions either manually or mechanically to maintain flows. Routine inspection of the managed pond levees, trails and internal berms for unintentional breaching and erosion shall also be necessary. If unintentional breaching or erosion occurs, the berm or levee shall be repaired as needed to maintain pond operations, prevent potential tidal inundation of adjacent managed ponds, and to maintain public access along the trails. Nesting islands shall also need to be periodically examined for erosion.

26) Viewing platforms, interpretive signs, trails, gates, and fences shall be inspected periodically and shall be repaired and maintained as needed. At the time that the Phase 1 Order was adopted, it was assumed that, in addition to the initial work described above, the new/improved levees in Ponds E9/E14, E10, and E13/E14 would require a second phase of construction after about 5 years of settlement had occurred. However, additional construction has not yet been necessary at the improved levees around these ponds. It is still possible that ongoing settlement may require a second phase of levee construction. The Project Management team and CDFW's Eden Landing staff shall continue to monitor these levees and will keep the Water Board informed of the need for, and timing of, any necessary levee improvements that are not already covered by existing permits for levee operations and maintenance. For Phase 2 levee improvements, a similar process will be used to monitor settlement and add material to adjust levees as necessary.

Construction Operations

27) A qualified biologist shall conduct a tailgate talk to inform construction crews regarding the sensitive wildlife resources and exclusion zones within the proposed construction areas, and regarding what to do if special status species are encountered.

28) A qualified biologist shall be present to monitor construction activities in or near areas known to be occupied by salt marsh harvest mouse and Ridgway's rail. The biologist shall have the authority to install or require wildlife protection measures such as fencing, noise buffers or noise level limitations during avian breeding seasons, and temporary halting or redirecting of construction activities to avoid impacts to sensitive species. Water Board staff shall be notified if construction activities are halted or redirected.

29) Consistent with the USFWS Biological Opinion (USFWS, Reference No. 08FBDT00-2017-F-0109-2, November 21, 2017), the Discharger shall avoid construction activities during the nesting period of the Ridgway's rail (February 1-August 31). If construction activities must occur during nesting periods, a qualified biologist shall conduct pre-construction surveys up to 72 hours before construction begins, using survey methods approved by the USFWS. Due to tidal influences on construction/survey areas, surveys shall be conducted as close to the actual construction period as is practicable. The exact survey distances vary depending on site characteristics, such as natural barriers, between potential nests and construction activities. Water Board staff shall be notified if the work plan is modified.

30) The Discharger shall minimize in-water construction during periods when listed species may be present.

31) Since the Discharger will be impacting greater than one acre in each Phase 2 pond complex, prior to the beginning of project construction, the Discharger or the Discharger's contractor shall submit a Notice of Intent (NOI) to the State Water Board for coverage under the General National Pollutant Discharge Elimination System (NPDES) construction permit and shall implement required Best Management Practices (BMPs) to prevent water pollution from construction activities. The Discharger shall utilize both in-water and on-land BMPs such as the use of coffer dams and measures to prevent and control the potential spills of hazardous material into the creeks and sloughs. Contractors are required to implement BMPs identified in a Storm Water Pollution Prevention Plan (SWPPP) for controlling soil erosion and discharges of other construction-related contaminants such as fuel, oil, grease, paint, concrete, and other hazardous material. Emergency response, routine maintenance, and preventative activities shall be included in the plan. The plan shall be submitted to the Water Board for review and comment at least 30 days prior to the start of construction and must be acceptable to the Executive Officer.

32) The Discharger shall have a construction monitor on site to ensure that the project is constructed according to plan. The construction monitor shall also resolve

implementation questions and refer "Requests for Information" and "Submittals" to the design engineers. Biological monitors, either USFWS or CDFW staff or contractors, shall be on site during specific activities to ensure compliance with mitigation measures and protection of listed species, as discussed above. Construction monitoring notes and observations shall be maintained for five years after project construction is completed, and submitted to the Water Board upon request.

Soil Excavation and Placement Provisions

33) To minimize the effects on special status fish species of temporary increases in suspended sediment and turbidity, the use of best management practices for turbidity control shall be employed during all in-water work conducted in the sloughs or bay, where appropriate.

34) To minimize the effects on special status fish species resulting from the loss of existing habitat, construction activities in river or slough areas having immersed or submersed aquatic plants shall be avoided to the maximum extent practical.

35) Ditch blocks shall be located in such a way as to not trap fish at low tide. Berms adjacent to starter channels shall be constructed on one side of the channel only, and shall be discontinuous, so that fish have easy access to the starter channels as the tide recedes.

36) Construction activities shall be scheduled to avoid the local nesting periods of the special status wildlife species, to the extent practical. When construction is conducted during the nesting period of a special status species known to be present, the activities shall be restricted to maintain a 150-foot buffer between heavy equipment and the nesting sites. Construction activities shall be scheduled in such a way as to limit the period of disturbance in a particular area to as brief a time window as is practical.

37) Before constructing facilities within tidal marsh habitat, the Discharger shall conduct clearance surveys for all species of concern in the construction area.

38) To the extent feasible, the Discharger shall avoid construction activities in or near marsh habitat suitable for the salt marsh harvest mouse.

Mosquito Abatement Provision

39) The Discharger shall coordinate with the county mosquito abatement districts during the design, implementation, and operations of the SBSPRP Phase 1 and Phase 2 Projects.

Potential Future Sediment or Soil Importation Provisions

40) If sediment is imported for SBSPRP areas during or after the completion of Phase 2 projects, the following conditions shall apply and be subject to Executive Officer approval: (i) instructions listed under Specification B.1 shall be followed; (ii) if the materials is proposed for levee maintenance, a levee inspection report shall be submitted at least 30 days prior to dredged material placement and, (iii) if applicable, a work plan and schedule for making any repairs or improvements shall also be submitted prior to dredged material placement.

41) If upland soil is imported for SBSPRP areas during or after the completion of Phase 1 projects, the following conditions shall apply and be subject to Executive Officer approval: (i) instructions listed under Specification B.2 shall be followed, including conformance with the *South Bay Salt Pond Quality Assurance Project Plan for Fill Import to Operate and Maintain Levees at Ravenswood and Alviso Salt Pond Complexes* (QAPP) (H.T. Harvey & Associates, January 12, 2017); (ii) if the materials is proposed for levee maintenance, a levee inspection report shall be submitted at least 30 days prior to dredged material placement and, (iii) if applicable, a work plan and schedule for making any repairs or improvements shall also be submitted prior to imported soil placement.

42) Imported dredged material placed into ponds shall be kept under standing water until breaching and tidal influence is restored. At least 30 days prior to dredged material placement a report shall be submitted, acceptable to the Executive Officer, which describes how the area will be kept wet.

On-Going Operation and Maintenance Provisions

43) Construction activities, both within the Phase 1 and 2 ponds and outside of the Phase 1 and 2 action areas, necessary for the on-going maintenance of existing levees and infrastructure may include the following activities, not all of which may be used at a given pond:

A. Repair, replacement and servicing of existing facilities.

a) Repair and replacement of existing bay intake/outlet structures, and related facilities such as pumps, boat launches, gates, pipelines, siphons, open channels and culverts, and removal of silts, debris and algae. Deleterious materials (i.e., litter) shall be segregated from excavated material and discarded as general waste following appropriate characterization and regulatory protocols. Excavated material shall be placed in an identified upland area for reuse, unless otherwise restricted under regulatory criteria.

b) Excavating, clearing, and retrenching of existing intake structures, boat launches and conveying ditches, so long as the existing configuration is not altered and the structure or ditch conforms with its engineered purpose. Excavated material shall be disposed onto levee tops above the plane of the high tide in a

manner that secures the material in place, or be hauled off-site to a non-jurisdictional area for reuse or disposal.

c) Repair and replacement of existing bridges, bridge foundations and abutments within the network of salt pond levees.

d) Repair and replacement of other items such as existing fences, tide gates, siphons in non-tidal areas, power lines, etc., provided such repair and maintenance does not deviate from the plans of the original facility.

e) Repair of ongoing and new authorized reaches of riprap. The authorized riprap areas are designed to have approximately 3:1 slope. If additional work would exceed the existing reach by 10 linear feet, then the proposed design shall be submitted in accordance with the procedures for new work in the riprap section (B.h) below.

f) Stabilization or revegetation of habitat transition zones.

B. Ongoing and new work:

a) Placement of dredged and/or imported fill material on the pond side of salt pond levees below the plane of high water in the pond, for the purpose of raising and fortifying the levees to prevent degradation. The dredged and/or imported fill material shall be placed along the inside and the top of the salt pond levee in accordance with appropriate best management practices.

b) Dredging of existing borrow ditches within the salt ponds for the purpose of placing the dredged material on existing levees.

c) Dredging in salt ponds to allow a dredge to cross a pond. This includes the placement of dredged material on the pond, with the placement of dredged material on the pond bottom along the side of the dredged channel.

d) Dredging of and placement of dredged material at up to 21 existing dredge locks within the SBSPRP footprint that are not being utilized by Cargill, and at any newly constructed authorized dredge locks, to allow the dredge to access the salt ponds. Advanced notification for these activities (See Provision E.19) shall include specific quantities of material to be dredged and placed, and drawings indicating prestaked, designated areas for stockpiling, side casting and borrowing material. Breached levee material, stockpiled atop the main levee from the last time the lock was accessed, shall be used to dam the breach following entry. Upon dredge exit, breaching and plugging of levees shall be performed in a similar fashion to that described above. The salt marsh muds that were excavated and sidecast in the access cut shall be retrieved and placed back into the access cut and channel, closing it behind the dredge.

e) Dredging within shallow sloughs to provide up to four feet of clearance for access by the dredge to salt ponds. Dredged material that cannot be placed on salt

pond levees may be placed on bare mud flats or sidecast, following approval in accordance with the notification procedure (See Provision E.19). Some slough dredging may also be performed near dredge locks for the purpose of obtaining additional mud to bring the access cut to the desired elevation following exit by the dredge.

f) Installation of new intake/outlet structures, new pumps, siphons, culverts, power transmission lines channels/ditches, crossing of channels and streams, in conjunction with new work, or relocation of existing structures.

g) Construction of new pumping donuts, internal coffer dams, and internal salt pond levees.

h) Placement of new riprap along outboard and inboard levees, as needed to fortify the slopes and prevent erosion, so long as the proposed new riprap is placed below the high tide line and/or high pond level at a slope of about 4:1 where needed. Care shall be taken to minimize the number of voids between the rubble in order to maintain structural integrity and prevent burrowing. Riprap will not be placed on top of non-eroding salt marshes.

i) Repair and replacement of siphons that cross salt marshes, sloughs and channels that would require extensive trenching and side-casting of mud.

j) Dredging and placement of bay muds into eroded areas along selected outboard levees for the purpose of encouraging the establishment and expansion of salt marsh vegetation as a means of diffusing wave energy and preventing levee erosion. The quantities of dredging material to be moved will vary greatly, depending on site specific conditions, and will be included in the notification procedures (See Provision E.19).

k) General maintenance activities to maintain the Phase 1 elements of the SBSPRP once implementation is complete. This also includes repair of water control structures and placement of materials on internal levees and nesting islands as needed to maintain ecological function and values.

General Provisions

44) The Discharger shall comply with all the Prohibitions, Specifications, Limitations and Provisions of this Order, immediately upon adoption of this Order, unless otherwise provided below.

45) The Discharger shall notify the Water Board immediately whenever violations of this Order, for which the Discharger is responsible, are detected.

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

47) The Discharger shall implement and comply with appropriate Best Management Practices (BMPs) to prevent and control erosion and sedimentation.

48) Construction contractors working on the Project shall be required to provide their employees with spill prevention and response training, and shall be required to have spill response equipment available at the job site, as directed by the Discharger. Contractors shall provide double containment for any hazardous materials or wastes at the job site. Contractors shall be prepared to respond to any spill immediately and to fully contain spills in the SBSPRP area, including any open-water areas. The Discharger is responsible for work conducted by its consultants, contractors, and subcontractors on the Project.

49) 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.

50) The Discharger shall maintain a copy of this Order at the Headquarters of the USFWS Don Edwards San Francisco Bay National Wildlife Refuge, located off Thornton Avenue, about 0.8 miles south of State Route 84, in the City of Newark. The Order shall be available at all times to site personnel. The Discharger shall ensure that all individuals working on the SBSPRP sites, including all contractors and sub-contractors, are familiar with the contents and requirements of this Order, and with all relevant plans and BMPs.

51) The Discharger shall permit the Water Board or its authorized representative, upon presentation of credentials:

a. Entry onto premises on which wastes are located and/or in which records are kept.
b. Access to copy any records required to be kept under the terms and conditions of this Order.
c. Inspection of any monitoring equipment, construction area(s), or monitoring method completed as part of the Project.
d. Sampling of any discharge or surface water covered by this Order.

52) 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 this agency or other agencies or organizations.

53) The Discharger shall immediately notify the Water Board by telephone or email whenever an adverse condition occurs as a result of the proposed discharge or construction activities. An adverse condition includes, but is not limited to, a violation or threatened violation of the conditions of this Order, significant spill of petroleum products or toxic chemicals, or other events that could affect compliance. Pursuant to CWC Section 13267(b), 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 action(s) necessary to remedy the condition, and specify a time schedule for performance, subject to modification by the Water Board.

54) The Discharger shall halt work activities if dead or dying fish, or fish exhibiting stress, are observed within 1,000 feet of work activity or discharge. The Discharger shall immediately assign a qualified biologist to investigate the cause of the problem, and to identify an acceptable response, if the cause is determined to be the work activity or discharge. The Discharger shall immediately report all incidents of dead, dying, or stressed fish, as well as prescribed action plans, to the Water Board.

55) All reports pursuant to this Order shall be prepared under the supervision of a suitable professional in the State of California.

56) This certification or Order is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to CWC Section 13330 and Section 3867 of Title 23 of the California Code of Regulations (23 CCR).

57) This certification action 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 certification application was filed pursuant to 23 CCR Subsection 3855(b) and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

58) Pursuant to CWC Section 13260, 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. 833812 in the header for this Order, the Regulatory Measure ID no. 412258, and the applicable year.

59) The Water Board may modify, or revoke and reissue, this Order if present or future investigations demonstrate that the discharge(s) governed by this Order shall cause, have the potential to cause, or shall contribute to adverse impacts on water quality and/or beneficial uses of the receiving waters. The Water Board may reopen this Order to review results of the Discharger's and Water Board staff's studies and new

data on Section 303(d) listed contaminants and decide whether effluent limits should be revised.

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

_____
Bruce H. Wolfe
Executive Officer

Attachments

A: Figures
B: Supplemental Tables
C: Adaptive Management Plan and March 2018 Addendum on Habitat Transition Zones
D: Water Quality Self-Monitoring Program (SMP)
E: (Draft) Landscape, Habitat, and Biological Species Monitoring Plan
F: Standard Provisions and Reporting Requirements