San Francisco Bay Conservation and Development Commission

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TO: Commissioners and Alternates

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SUBJECT: **Proposed Bay Plan Changes (Appendix 1 to Bay Plan Amendment No. 1-26 Staff Report and Preliminary Recommendation)**
(For Commission consideration on October 15, 2026)

BPA 1-26 Proposed Bay Plan Changes

This document contains findings and policies from the San Francisco Bay Plan that Bay Plan Amendment 1-26 is proposing to change. Additions are in blue underlined text, and removals are in ~~red struck-through text~~. This document is presented in the format of a basic document for purposes of the public review period. If BPA 1-26 is approved by the Commission, Commission staff will update the Bay Plan to incorporate the approved changes. A clean copy of the proposed changes is also included. A Table of Contents can be found on the following page.

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BPA 1-26 Proposed Bay Plan Changes in Tracked Changes

Summary

Major Conclusions and Policies

4. **Justifiable Filling.** Some Bay filling may be justified for purposes providing substantial public benefits if these same benefits could not be achieved equally well without filling. Substantial public benefits are provided by:

    g. Restoring, enhancing, or creating ecosystems using suitable sediment and soils that provide habitat for native fish, other aquatic organisms, or wildlife; enhance coastal resilience; and provide services such as water filtration, carbon sequestration, protection of shorelines from flooding and erosion, and raising the surface elevation of subsided land. Fill for these purposes will be especially important to facilitate the adaptation of habitats to rising sea level.

8. **Fill Safety.** Virtually all fills in San Francisco Bay are placed on top of Bay mud. Bay mud, depending on thickness, depth, and grain size, consolidates over time due to gravity, additional sediment deposits, and the weight of material placed on it. The construction of buildings on such fills creates a greater number of potential hazards to life and property, during normal settling and ~~during~~ earthquakes, than does construction on bedrock or ~~on~~ dense, hard soil deposits. Adequate design measures can be taken~~, however,~~ to reduce these potential hazards to acceptable levels.

Major Plan Proposals

1. **Develop Maritime Ports.** Port expansion and development should be planned for Alameda, Benicia, Oakland, Redwood City, Richmond, and San Francisco.~~, and Selby.~~

2. **Deepen Shipping Channels.** Major shipping channels from the Golden Gate to the Delta, and to Oakland, Redwood City, Richmond, and San Francisco should be deepened and the sediment should be beneficially reused, if the channels ~~they~~ limit marine terminal activity and ~~are~~ the deepening is economically and environmentally acceptable.

6. **Maintain Wildlife Refuges and Restore ~~in~~ Diked Historic Baylands.** Prime wildlife refuges in diked-off areas around the Bay should be maintained and several major additions should be made to the existing refuge system. The refuge system is critical to health of the Bay, and additional diked Baylands should be restored to support Bay fish and wildlife and sea level rise adaptation. Because these areas were diked from the Bay, the land has subsided below sea level. When natural sediment supply is not sufficient to restore these important habitats and protect them from rising sea level, suitable upland soils and dredged sediment should be used to restore elevation and historic wetland habitat.

The Bay as a Resource

Fish, Other Aquatic Organisms and Wildlife

Findings

k. Tidal marshes and tidal flats are particularly vulnerable to inundation from sea level rise, changes in sediment supply, and lack of migration space. Current scientific predictions of sea level rise and declining sediment supply support the likelihood that many marshes and mudflats ~~may~~ will not be able to adapt to these changes without human intervention. If marshes and mudflats do not accrete sufficient sediment and/or migrate to higher elevations, they ~~and~~ may be lost or degraded by the end of the century. ~~if they are not able to accrete sediment and/or migrate to higher elevations.~~ Placing sediment or soil in appropriate locations ~~will be~~ is necessary to ensure that species dependent on tidal marshes and tidal flats have sufficient habitat into the future. Placement of sediment and soil will be particularly important in subsided Baylands and tidal marshes to build transition zones, increase site and/or marsh plain elevation, and create high tide refugia. Placement of sediment may also be necessary in shallow intertidal or subtidal areas to increase mudflat elevation or to increase sediment transport to adjacent marshes to increase marsh plain elevation. ~~Little is known about how subtidal areas will adapt to sea level rise or the need for sediment in these areas.~~ Limited knowledge about deep water habitats makes it difficult to predict how major changes, including sediment placement, in these areas may adversely affect fish, other aquatic organisms, and wildlife.

l. Bay habitats are dynamic, ever-evolving systems that are predicted to change even more with sea level rise. For projects in which fill is proposed, the amount of fill required to ensure the persistence of these habitats into the future will depend on the rate of sea level rise and the time horizon of the project. ~~For example, more fill will likely be required to sustain marsh elevations through the year 2100 than through the year 2050.~~ As described in the San Francisco Estuary Institute's Sediment for Survival report (2021), large amounts of sediment will be needed to restore, sustain, and adapt marsh and mudflat elevations through the year 2100. Placement of large volumes of fill to assist existing habitats in adapting to long-term sea level rise projections may not be immediately necessary and may result in unnecessary near-term loss of habitat and other impacts to the Bay. Placing smaller volumes of fill incrementally could serve the function of facilitating habitat adaptation to sea level rise while also minimizing impacts of fill to fish, other aquatic organisms, and wildlife. Smaller environmental perturbations that are similar in scale to ~~a~~ natural disturbance events, such as sediment deposition

following a flood event, are often more likely to allow habitats to adapt and rebound than a major perturbation that could take much longer for habitats and species to recover. However, in some cases, a larger, single placement of fill may be more feasible or result in fewer impacts to Bay natural resources. Prioritizing placement of large volumes of sediment in subsided Baylands prior to accelerated rates of sea level rise will help them reach marsh plain elevation and support wildlife habitat sooner.

m. The interface between fresh and marine water, or brackish water, is an extremely dynamic and productive area. The connection between many Bay tributaries and the Bay has been altered, reducing this unique and important transitional habitat. Wildlife uses these transitional areas for migration, foraging, growth, and spawning. Reconnecting creeks and streams and widening flood plains provide important opportunities for wildlife to access and use these limited habitats. Reconnecting these areas supports sediment transport and deposition on seasonal and tidal wetlands, helping them adapt to rising seas and expansion of Bay waters landward.

Water Surface Area and Volume

Findings

e. Some activities that maintain or expand Bay water surface area and volume can restore conditions that existed before the Bay was diked and filled. Although dredging increases Bay volume and surface area by removing sediment, it adversely impacts subtidal and intertidal habitat.

Tidal Marshes and Tidal Flats

Findings

p. Fill material, such as upland soil, rock, and sediment~~s~~ dredged from the Bay, can enhance or beneficially contribute to the restoration of tidal marsh and tidal flat habitat by: (1) raising areas diked from the Bay to an elevation that will help accelerate establishment of tidal marsh; and (2) establishing or recreating rare Bay habitat types.

Policies

6. Any habitat project should include clear and specific long-term and short-term biological and physical goals, success criteria, a monitoring program, and as appropriate, an adaptive management plan. Design and evaluation of the project should include an analysis of: (a) how the project's adaptive capacity can be enhanced so that it is resilient to sea level rise and climate change; (b) the impact of the project on the Bay's and local embayment's sediment transport and budget; (c) localized sediment erosion and accretion; (d) the role of tidal flows; (e) potential invasive species introduction, spread, and their control; (f) rates of colonization by vegetation; (g) the expected use of the site

by fish, other aquatic organisms and wildlife; (h) an appropriate buffer, where feasible, between shoreline development and habitats to protect wildlife and provide space for marsh migration as sea level rises; (i) site characterization; (j) how the project adheres to regional restoration goals; (k) whether the project would be sustained by natural processes, including whether additional sediment or soil should be considered as part of the restoration or adaptation strategy where natural sediment supplies are not sufficient; and (l) how the project restores, enhances, or creates connectivity across Bay habitats at a local, sub-regional, and/or regional scale.

Fresh Water and Sediment ~~Inflow~~ Flow

Findings

a. The Bay, Sacramento-San Joaquin River Delta, and ocean, are parts of an interconnected estuary system. Fresh water flowing into the Bay~~, most of which is~~ from the Delta and local tributaries dilutes the salt water of the Pacific O~~o~~cean flowing into the Bay through the Golden Gate. The Bay waters thus provide a gradual change from the salt water of the ocean to the fresh water flows of the Sacramento and San Joaquin Rivers. This delicate relationship between fresh and salt water helps to determine the ability of the Bay to support a variety of aquatic life and wildlife in and around the Bay.

b. The gradual change in the salt content of the Bay ~~appears~~ is necessary for the survival of anadromous fish such as ~~king~~ Chinook and Coho salmon, steelhead, striped bass, and American shad~~,~~ as they progress upstream toward their spawning grounds~~,~~ and for the survival of their smolt ~~fingerlings~~ as they descend to salt water. An abrupt change in the salt content of Bay water would probably end the anadromous fish runs.

c. The fresh water flow from the Sacramento and San Joaquin Rivers is an important ~~(but not major)~~ source of the oxygen necessary in the waters of the Bay to support marine life and to abate pollution, and it assists in flushing parts of the Bay system, particularly during peak flows of the spring when the snows melt in the Sierra.

d. Fresh water flow into the Bay during the winter and spring months is of particular importance in maintaining the health of the Suisun Marsh, the largest remaining brackish marsh in the region ~~around the Bay~~ and a waterfowl habitat of nationwide importance.

e. In addition to providing fresh water, the Delta and local rivers and creeks provide both fine and coarse grain sediment to the Bay though suspended and bedload transport. Sediment is a critical building block of habitat, including the subtidal Bay bottom, made

up of approximately 80% mud, clay and silt, and 20% sands, with a limited amount of gravel. Like water, sediment is exchanged between the ocean and the Bay on a daily basis.

f. ~~e.~~ The ~~fresh water~~ flow~~s~~ of fresh water and sediment from the Delta and local tributaries bring critical sediment supply ~~from the Sacramento and San Joaquin Rivers into the Delta and~~ to the Bay. The sediment supply from these sources has ~~have~~ been reduced ~~in the past~~ by the construction of dams and water diversions of federal, state, and local governments for agricultural, industrial, and domestic uses, as well as flood protection channels, tide gates, and streambed maintenance projects. Additional diversions are being sought, and further substantial diversions could change the salt content of Bay water and sediment supply to the Bay, thereby adversely affect the ability of the Bay to support a great variety of aquatic life.

g. Historically, the Bay had abundant sediment supply, but scientists have documented a significant decline in sediment supply to the Bay since approximately 1998. With the decrease in supply, the erodible sediment pool, or the amount of sediment that can be lifted into the water by currents and tides, has become more important. The Bay's erodible sediment pool was depleted in the late 1990s, which has limited the concentration of suspended sediment able to supply wetlands and mudflats (Schoellhamer, 2011).

h. ~~f.~~ In periodically reviewing existing diversions under its reserved jurisdiction, the State Water Resources Control Board issued Decision 1485 and the Delta Plan in 1978. The Decision and the Delta Plan set water quality standards for the Delta and the Suisun Marsh and continued to reserve jurisdiction over salinity control, fish and wildlife resources and coordination of the federal and state water projects so that the standards can be reviewed periodically. The Delta Plan noted that the protection of historical levels of fish and wildlife resources (1922-1967) should be the standard for future water diversions. In addition, the Delta Plan recognized for the first time, the State Water Resources Control Board's statutory responsibility to set standards for San Francisco Bay to protect beneficial uses of the Bay. Although the Board did not establish standards for the Bay because of a lack of information, the Board directed that studies be conducted to develop that information, the Board also determined that alternative water supplies must be found for the Suisun Marsh and completed by 1984. Although the Decision and the Delta Plan have certain flaws, such as their use of "without project" conditions as a standard at this time, and their inability to stop the decline in ~~the~~ longfin and Delta smelt, steelhead, and salmon ~~and striped bass~~ populations, the State Board has recognized the need to address these problems and has begun studies to that end. It is

important that such studies be conducted expeditiously to preserve what remains of the fishery and to develop information about the Bay before vast sums of money are committed to water development projects that will reduce freshwater inflow to the Bay in the future.

i. The increasing rate of rising seas resulting from climate change will affect the amount of saltwater intrusion into the Delta and local tributaries, changing the way the Bay and Estuary function. The California Department of Water Resources controls large salinity gates in Suisun Marsh to reduce the flow of salt water upstream. Local governments may request additional tide gates on local tributaries to reduce upstream flow of salt water. Constructing new tide gates restricts freshwater flow and sediment into the Bay from local sources. This could in turn reduce water, nutrient, sediment, and wildlife exchanged between the Bay and its tributaries, further stressing the ecological balance in the region.

j. The Commission's Bay jurisdiction extends to the head of tide in these areas with the exception of the specific tributaries identified as "certain waterway" jurisdiction in the McAteer-Petris Act. The head of tide is the extent to which tidal action moves in a creek or channel between lower low tide and higher high tide.

Policies

1. Diversions of fresh water and sediment ~~should~~ shall not reduce the ~~in~~flow into the Bay to the point of damaging the oxygen content, freshwater exchange, or sediment supply of the Bay, the flushing of the Bay, or the ability of the Bay to support ~~existing~~ habitat and wildlife.
2. High priority should be given to the preservation of Suisun Marsh through adequate protective measures including maintenance of freshwater inflows.
3. The impact of diversions of freshwater inflow into the Bay should be monitored by the State Water Resources Control Board, which should set standards to restore historical levels (1922-1967) of fish and wildlife resources. The Bay Commission should cooperate with the State Board and others to ensure that adequate freshwater inflows to protect the Bay are made available.
4. Flood protection and streambed maintenance projects shall fully consider and, where possible, reconnect or realign tidal creeks to wetlands to supply sediment and provide more expansive floodplains for water absorption for both creek and coastal flooding. These projects should provide substantial net benefits for Bay habitats and native species, and short-term adverse impacts may be acceptable where over time the projects create more sustainable and functional habitat and flood systems.

Development of the Bay and Shoreline

~~Dredging~~ Sediment Management

Findings

a. ~~Much of the Bay bottom is shallow averaging 20 feet in depth and the bottom is covered with accumulated silt, sand, and clay. An estimated eight million cubic yards of sediment is carried into the Bay annually from tributaries, most of it settling to the Bay bottom. In addition, over 100 million cubic yards of sediment is recirculated in Bay waters each year, some of which lodges in harbors and navigable channels from which it must be dredged at considerable cost.~~

b. ~~Dredging consists of excavating or extracting materials from the Bay. Dredging is often necessary to provide and maintain safe navigation channels and turning basins with adequate underkeel clearance, harbors for port facilities, water-related industries, recreational boating, and flood control channels. Dredging of unstable Bay muds may also be needed to accommodate Bay fill projects. Dredging projects remove existing bottom habitat and can disrupt surrounding areas through turbidity and other impacts.~~

c. ~~Some waste disposal practices have deposited pollutants into the Bay, some of which have contaminated Bay sediments. These pollutants are not distributed evenly in the Bay and some areas are highly contaminated. Dredging and subsequent disposal of contaminated sediments in the Bay may adversely affect Bay organisms.~~

d. ~~In the past, material dredged from the Bay was disposed throughout the Bay. In more recent times, most disposal has occurred at one of four Bay disposal sites designated by the U.S. Army Corps of Engineers, the Regional Board, and the Commission where the material can disperse and cause as few environmental impacts as possible. These sites are: (1) off Alcatraz Island; (2) in San Pablo Bay; (3) in the Carquinez Strait; and (4) in the Suisun Bay Channel. At the site nearest the ocean, next to Alcatraz Island, less than half of the disposed material is carried out to sea by the tides.~~

e. ~~Capacity at the disposal site near Alcatraz Island is limited because a large mound of dredged material has formed which, unless disposal is properly managed, may adversely affect water circulation and Bay aquatic life, pose a hazard to maritime navigation, and completely fill the site. The impact of dredged material disposal on Bay natural resources, which are also impacted by a variety of sources, remains controversial.~~

f. ~~In 1994, the U.S. Environmental Protection Agency designated the "Deep Ocean Disposal Site," which is fifty miles outside of the Golden Gate. The EPA manages the site and has set a yearly capacity of 4.8 million cubic yards of dredged material.~~

~~g. Most dredged material can be reused rather than treated as a waste. The material can be used to bolster levees and dikes, to create and restore marshes and wetlands, to cover and seal sanitary landfills, and as fill in construction projects.~~

~~h. In the past, only small amounts of dredged material have been disposed at upland and diked baylands around the Bay. Fortunately, more reuse options are becoming available for dredged material disposal. These sites include Hamilton Wetlands Project in Marin County with a capacity of over 10 million cubic yards and the Montezuma Wetlands Project in Solano County with a capacity of 17 million cubic yards. Inclusion of the adjacent Bel Marin Keys parcel would likely more than double the capacity of the Hamilton project. Dredged material could be used at these sites to restore thousands of acres of wetlands. However, as identified in the Commission's *Diked Historic Baylands Study* and the San Francisco Bay Area Wetlands Ecosystem Goals Project diked baylands often contain seasonal wetlands, provide the primary opportunity for enhancement of seasonal wetlands or restoration of tidal wetlands, and can provide other important habitat functions that need to be taken into account as part of dredged material reuse projects to avoid losing critical natural habitat.~~

~~i. Shoreline facilities are needed to dry and prepare dredged material for some upland uses. These sites are particularly important for material with levels of contaminants that cannot be disposed in the Bay, but can be used as capping, lining and cover in solid waste landfills.~~

~~j. A variety of habitat types within the Bay sustain a multitude of plant, fish, and wildlife species. Many factors determine the habitat functions and values of a given area of the Bay, including water depth and clarity, type of substrate (rock, coarse sand, or fine-grained sand), type of vegetation, and salinity.~~

~~k. Each of the fish and wildlife species found in the Bay has particular habitat needs to forage, rest, take refuge, and reproduce. Although the San Francisco Bay Area Wetlands Ecosystem Goals Project comprehensively studied the baylands and made recommendations for the extent and location of wetlands and related habitats, no such study has been performed of the need for or appropriate mix of habitat types in the waters of the Bay.~~

~~l. Eelgrass beds are considered to be a valuable shallow water habitat, providing feeding, escape, or breeding habitat for many species of invertebrates, fishes, and some waterfowl. Eelgrass grows in relatively few locations in the Bay and requires special conditions to flourish. Cultivating eelgrass is difficult and efforts to grow eelgrass in San Francisco Bay have not succeeded.~~

m. Under its existing law and policies the Commission has approved minor amounts of Bay fill to create, restore or enhance habitat in the Bay. The selective deposition of dredged materials in the Bay to extensively modify Bay habitats might enhance the habitat value for some Bay species. However, such projects could also result in significant adverse impacts to Bay water circulation and quality and to Bay habitats and organisms that depend on the Bay. Insufficient information exists about the potential benefits and adverse impacts on which to base Baywide policies governing disposal in the Bay of dredged material that would result in largescale modification of Bay habitats, either through an individual project or cumulatively with other projects.

n. Continuation of baywide studies would help determine the need for, appropriate locations for, and potential effects of the use of dredged sediment for eelgrass or other shallow water habitat enhancement or restoration. The Commission approved a pilot project, the Oakland Middle Harbor Enhancement Area project, that could help to determine the feasibility of eelgrass or other shallow water habitat creation in the Bay.

o. The San Francisco Bay Regional Water Quality Control Board and the U.S. Environmental Protection Agency are responsible for determining appropriate dredged material pollutant testing and discharge standards and for assuring that dredging and disposal of dredged materials are consistent with the maintenance of Bay water quality. The U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers have joint federal responsibility for regulating ocean, Bay, and wetland disposal.

p. The California Department of Fish and Game, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service are responsible for management and protection of Bay organisms, particularly threatened and endangered species.

q. The Long Term Management Strategy (LTMS) program, initiated by the U.S. Army Corps of Engineers in 1991 in partnership with the Commission, the San Francisco Bay Regional Water Quality Control Board, the State Water Resources Control Board, and the U.S. Environmental Protection Agency, with the involvement of dredgers, fishermen, environmentalists and other interested parties, has comprehensively studied Bay dredging issues and prepared a long-range Bay dredging and dredged material disposal management plan and implementation program. The LTMS provides the basis for uniform federal and state dredged material disposal policies and regulations.

r. The LTMS has set goals to reduce in-Bay disposal over the next decade to one million cubic yards or less per year and to maximize use of dredged material as a resource.

s. Using dredged material as a resource is usually more expensive than existing disposal practices. Large reuse sites can attain economies of scale and increase feasibility of dredged material reuse. Concerted efforts are needed to plan, fund and implement reuse of dredged material. The ongoing efforts by government agencies, dredgers,

~~environmentalists and others have made great progress and should achieve the LTMS goals. However, if these efforts are not successful, in-Bay disposal may have to be restricted through regulatory controls.~~

~~t. The U.S. Army Corps of Engineers is the largest Bay dredger and has the greatest ability to implement alternative disposal options. Annually, small dredgers account for less than one quarter of a million cubic yards of material and have the least ability to implement alternatives to in-Bay disposal.~~

~~u. As part of the LTMS, a Dredged Material Management Office (DMMO) has been established to consolidate the processing of dredging permit applications by the staff of the LTMS agencies and the State Lands Commission. The DMMO provides a single application form and unified processing of applications for dredging permits.~~

~~v. Underground fresh water supplies are an important supplement to surface water now brought into the Bay Area by aqueduct from mountain reservoirs. Deep dredging of Bay mud, or excavation for tunnels or bridge piers, could strip the "cover" from the top of a fresh water reservoir under the Bay, allowing the salt water to contaminate the fresh water, or allowing the fresh water (if artesian) to escape in large quantities and thus cause land to sink. The precise location of groundwater reservoirs under the Bay is not yet well known, however.~~

~~w. More information on Bay sediment dynamics is needed to (1) better determine the impacts of dredging and dredged material disposal projects and (2) identify long-term trends in Bay sedimentation that relate to dredging needs and potential impacts to Bay resources, such as wetland and mudflats.~~

a. Prior to end of the last ice age, San Francisco Bay was a river system connecting the Sierra Nevada Mountains, the Central Valley, and the Coast Range to the Pacific Ocean. As the world warmed, sea level rose and drowned the river valleys to create the Bay. Sediment from the land entered into the Bay primarily from the Sacramento and San Joaquin Rivers at an estimated rate of 1.71 million cubic yards (cy) (1.3 million cubic meters (cM)) annually (Holmes et al., 2023). Tides and currents also brought sediment into the Bay from the ocean. Today, the geomorphology and bathymetry of San Francisco Bay vary and include deep water channels, headland “pinch points” that constrain water and sediment flow, embayments, sand waves and ripples, shallow shoals, intertidal mudflats, tidal wetlands, and sandy beaches.

b. Because Native American tribes of the region have inhabited and stewarded the shorelines and waters of the Bay Area for over ten thousand years, valuable tribal cultural resources exist in Bay sediment and the shoreline. Tribes possess unique and valuable knowledge and practices for conserving and managing these resources in a sustainable manner.

c. Sediment provides stability, nutrients and minerals, affects water and air quality, supports biodiversity, and forms the foundation of tidal flats, marshes, and shorelines, which absorb water and buffer storms. Bay species are wholly dependent on it. Sediment directly supports wetland function. From supporting the microbes and plants that form the base of the food web, to being a stable place in the landscape for habitats to grow and flourish, the sediment that supports wetlands is a vital natural resource. Different types of sediment are found throughout the Bay sediment system, with the majority being fine-grained (clay, silt, and mud) and a smaller portion being coarse-grained (Schoellhamer, 2011; Barnard et al., 2013). The "sediment system" includes fine and coarse-grained sediment from the Sacramento-San Joaquin River Delta, within San Francisco Bay, exchange with the Pacific Ocean at the Golden Gate, upland construction, and local flood and stormwater control systems (McKnight et al., 2023).

d. In the 1800s, there were an estimated 500,000 acres of tidal wetlands in the Bay Area. Hydraulic mining for gold in California began in the 1850s when high-pressure water was jetted against deforested hillsides of the Sierra Mountains, sending nine times the pre-mining amount of sediment downstream to the Sacramento and San Joaquin River watersheds, and then into the Bay. Between 1849 and 1914, approximately 17.7 million cy (13.5 million cM) of mud, sand, and gravel was washed into the Bay annually until hydraulic mining was outlawed in the 1880s. In addition, people diked and drained wetlands for agricultural uses, built dams and aqueducts, placed fill in the bay, and diked land to produce salt and wetlands to hunt waterfowl.

e. The Bay Area has a history of modifying streams to facilitate development and protect urbanized areas from flooding. The San Francisco Estuary Institute's research has found that of the 353 historical creeks around the Bay, only 12% maintain their historical connection to the Bay. Most historic creeks were diverted into manmade channels, were routed underground, or were filled in completely.

f. As used in this Plan, **dredging** means removing sediment from an aquatic environment, whether in the Bay or its tributaries. Dredging is often necessary to provide and maintain safe navigation channels and turning basins with adequate under-keel

clearance, harbors for port facilities, water-related industries, recreational boating, and flood control channels. Dredging removes existing subtidal habitat, impacting the organisms that live in and on it, and can disrupt surrounding areas.

g. Both mechanical and hydraulic dredges are used for navigation dredging in the Bay Area. Mechanical dredging is done by using a clamshell or excavator dredge to remove sediment and is most frequently used because it is readily available and less likely to entrain sensitive fish species. Mechanically dredged sediment can be placed in a scow and either bottom dumped or offloaded. Hydraulic dredges remove sediment by suctioning it through a draghead or cutterhead and pumping it onto a scow or into the hold of a hopper dredge. Hydraulic dredging provides an opportunity to pump dredged material directly to desired location if nearby and outfitted for this function, however the suctioning of water and sediment entrains fish and other organisms.

h. Industry, maritime activities, urban runoff, and waste disposal practices have deposited pollutants into the Bay, some of which have been absorbed by fine grain sediment. Coarse grain sediment is generally found in high energy areas and its nature makes it less likely to absorb contaminants. Due to varying types of industry, connections through waterways, and disposal practices, pollutants are not distributed evenly in the Bay. Some areas of the Bay are relatively free from contamination, while a few areas are highly contaminated with legacy pollutants on the surface and in deeper sediment. Testing sediment for potential contamination helps determine whether it can be beneficially reused or where it can be disposed.

i. Disposal of dredged sediment in the Bay had not been well managed. Up until the 1970's, dredged sediment was side-casted. In response to concerns that dredging and disposal were causing impacts to Bay habitats, state and federal agencies consolidated disposal to four state and federally authorized in-Bay disposal sites. These sites were designed to disperse the sediment into the adjacent naturally deep-water channels to move the sediment downstream towards the ocean. Three multi-user sites include the Alcatraz (SF-11), San Pablo Bay (SF-10), and Carquinez Strait (SF-9), and one site, Suisun Channel (SF-16), dedicated to USACE use when dredging Suisun Channel. However, the Alcatraz did not function as expected and in the 1980s it mounded to within 30 feet of the surface and created a significant navigation hazard.

j. In response to scientific and environmental concerns, the Long Term Management Strategy (LTMS) program began, initiated by the U.S. Army Corps of Engineers (USACE) in partnership with the Commission, the San Francisco Bay Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board, and the U.S.

Environmental Protection Agency (USEPA), with the involvement of dredgers, fishermen, environmentalists and other interested parties. The LTMS programmatically reduces in-Bay disposal, increases beneficial reuse, and manages dredging and in an environmentally and economically sound manner. In 2001, the LTMS Management Plan set goals for the region to reduce annual in-Bay disposal to one million cy or less and to place 40% of dredged material at beneficial reuse sites, 40% in ocean environments, 20% at in-Bay disposal sites. Decreasing in-Bay disposal made more sediment available to be used as a resource.

k. When the LTMS Management Plan was created, beneficial reuse sites were limited; to support the reduction of in-Bay disposal while beneficial reuse sites were in development, the USEPA designated the "San Francisco Deep Ocean Disposal Site," (SFDODS) which is approximately fifty-five miles west the Golden Gate, 3,000 meters deep, and off of the continental shelf. The EPA and the USACE manage the site, with a yearly capacity of 4.8 million cubic yards of dredged material, and annual monitoring for impacts. It was considered an environmentally superior disposal site compared to in-Bay disposal due to the more sensitive estuarine waters compared to deep ocean environs. The site has been used for both clean sediment and sediment with more elevated levels of contamination to reduce or balance costs of beneficial reuse for dredging projects. However, in more recent years scientists and regulatory have recognized with the decrease in sediment supply and the more urge and extensive need for sediment in restoration projects, use of SFDOS removes sediment from the Bay sediment system. For this reason dumping of dredged sediment at the deep ocean disposal site should be discouraged due to the need for sediment at habitat projects within the Bay. However, instances occur when disposal of sediment at DODS is necessary.

l. The LTMS Program developed the Dredged Material Management Office (DMMO) as a joint interagency program staffed by BCDC, RWQCB, State Lands Commission, USACE, USEPA. The California Department of Fish and Wildlife, the National Marine Fisheries Service, and the U.S. Fish and Wildlife Service also provide advice and expertise. The purpose of the DMMO is to collaboratively review sediment quality sampling and analysis plans, analyze test results, and make determinations as to whether sediment is suitable for beneficial reuse, or suitable for disposal in-Bay or SFDODS. Another goal of the DMMO is to increase efficiency and coordination between the agencies and foster a consolidated approach to dredged sediment management issues. The DMMO provides a single application form and unified processing of applications for dredging permits.

m. In 2001, the Commission adopted regulations, consistent with the LTMS in-Bay disposal goal, establishing target volumes for the reduction of in-Bay disposal of dredged sediment over time and a process for possible implementation of individual in-Bay dredged sediment allocations if the applicable target volume is exceeded. The regulations provide that the target volume for the calendar years after 2012 is an average of 1.25 million cubic yards per calendar year for each three year period.

n. Sediment continues to be removed from the Bay through the maintenance of navigational channels and flood control channels and streambeds. According to the San Francisco Estuary Institute's Sediment for Survival report (2021), over 3 million cubic yards of sediment is dredged for navigation purposes from the Bay annually since 1990. Between 2000 and 2020, approximately 60% of sediment dredged from the Bay was disposed of as waste at regulated disposals sites in the Bay and in the deep ocean. Between 2000 and 2013, 1.7 million cubic yards of sediment was removed from flood control channels. According to the San Francisco Estuary Institute's Changing Channels report (2017), approximately 60% of sediment removed from flood control channels is disposed of as waste.

o. Over time, human activities have disrupted the Bay's natural water flow and sediment system and have resulted in a decreased sediment supply to the Bay. This contributed to the loss of around 90% of wetlands in the Bay and has made it difficult for the remaining wetlands and restored sites to survive and adapt. Sand mining, like dredging, is a historical and ongoing activity that affects sediment supply dynamics in the Bay. The decline in sediment supply and the continued removal of sediment from the Bay system has led to a current period of sediment decline. Without a robust sediment supply, sea level rise threatens to flood tidal marshes and wetlands over time. To maintain elevation, large volumes of sediment will be needed. The region's suspended sediment supply is not sufficient to restore subsided areas to the necessary elevation or to keep pace with sea level rise. According to the San Francisco Estuary Institute's Sediment for Survival report (2021), the Bay will need between 450 to 650 metric tons of sediment and soil to preserve, restore, and maintain wetland habitat, and adapt to rising sea levels through 2100.

p. In order to meet this demand, it is imperative for the region to retain the sediment already within the system through beneficial reuse. As used in this Plan, **beneficial reuse** means using dredged sediment to preserve and restore bay and shoreline habitats,

preserve and restore tidelands and the shoreline for public enjoyment, increase the resilience of Bay and shoreline habitats to rising sea levels and flooding, or implement similar environmentally beneficial projects.

q. In March of 2025, the Commission published the collaboratively developed San Francisco Bay Sediment and Soil Beneficial Reuse Action Plan for Wetland Restoration and Adaptation (Action Plan). Among the Action Plan's 70 actions the region can take to address its sediment deficit, Action 2.4.2 directs the Commission to "Assess the San Francisco Bay Plan findings and policies regarding sediment supply and beneficial reuse to identify necessary improvements and propose amendments."

r. As used in this Plan, **excavation** means removing soil from an upland area. In areas upland from the Commission's jurisdiction, excavation projects around the Bay Area including general grading, creation of below-grade spaces, and maintenance of channels and streams often generate excess soil that is traditionally sent to landfills. Depending on an excavation project's location, excavation project managers can bring the soil for reuse at a wetland restoration site instead and reduce or avoid disposal costs.

s. Dredged sediment and excess soil from construction projects are critical natural resources that can be beneficially reused to help the region adapt to sea level rise. Fine-grain sediment from navigation dredging can be reused for wetland restoration and adaptation in subsided Baylands and on mudflats and marshes to raise elevation. Upland soil is more effective for stabilizing wetland restoration projects with levees, berms, ecotones, islands, upland refugia, and as general fill for adaptation projects. Excess upland soil has been used as for general fill at Bair Island, and in the construction of ecotones, flood protection levees, and islands at South Bay Salt Pond Restoration Project and South San Francisco Bay Shoreline Project.

t. As stated in Public Trust Finding i, sediment dredged from lands subject to the public trust is a public trust resource, and beneficial reuse of dredged sediment protects public trust uses and meets public trust needs by preserving and restoring Bay and shoreline habitats as ecological units to provide food and habitat for birds and wildlife and for scientific study, preserving and restoring tidelands and the shoreline for public enjoyment, including recreation, public access, and open space, and by increasing the resilience of Bay and shoreline habitats to rising sea levels.

u. Reused dredged sediment has been successfully utilized in restoration projects in the Bay since 1994. In the Sonoma Baylands, a site that had been diked and drained for agriculture, wetlands were restored when dredged sediment was used to raise the marsh plain elevation, creating conditions that allowed the marsh to evolve naturally

and revegetate. Other examples of restoration projects that incorporated beneficial reuse include Hamilton Wetlands, Montezuma Wetlands, and Cullinan Ranch. Reuse of excess upland soil began in earnest in 2018 at the Bair Island Restoration Project, and has become a more important resource as transitional habitat and ecotones have been incorporated into restoration projects.

v. Timing misalignments between upland soil availability and restoration sites readiness can be a barrier to the beneficial reuse of upland soil. Developing temporary, land-based stockpiles throughout the region to store soil for restoration projects can help make it available when restoration sites are ready to receive it. Double handling soil typically costs more than taking it directly to a restoration site. Stockpiling also presents challenges related to ownership and location, funding, site management and security, soil quality management, potential impacts on terrestrial habitat, and ability of stockpiles to develop into habitat while waiting for reuse opportunities.

w. For some restoration sites that are too shallow to receive sediment by barge or located far from dredging projects, transporting sediment and soil by truck, which can emit greenhouse gases, may be the only way to bring needed material to the site. When trucking is necessary, engagement with identified vulnerable or disadvantaged communities and local governments in the project area can help limit potential adverse impacts to the community.

x. Because oxygen levels vary between materials that have and have not remained submerged in water, testing protocols and suitability determinations for upland soil and dredged sediment are different. Due to differences in the testing requirements for different types of material, to reduce ecological risk, suitability determinations for placement in the Bay and shoreline band should be based on a collaborative testing protocol with coordination between the San Francisco Bay Regional Water Quality Control Board, the Commission, and other entities as appropriate.

y. Managing soil flow on landscape scales, rather than by city/county jurisdiction, may allow soil to flow more efficiently from sources to areas most in need and benefit ecosystems such as marsh and diked Baylands that extend across jurisdictional lines.

Policies

1. ~~Dredging and dredged material disposal should be conducted in an environmentally and economically sound manner. Dredgers should reduce disposal in the Bay and certain waterways over time to achieve the LTMS goal of limiting in-Bay disposal volumes to a maximum of one million cubic yards per year. The LTMS agencies should implement a system of disposal allotments to individual dredgers to achieve this goal only if voluntary~~

~~efforts are not effective in reaching the LTMS goal. In making its decision regarding disposal allocations, the Commission should confer with the LTMS agencies and consider the need for the dredging and the dredging projects, environmental impacts, regional economic impacts, efforts by the dredging community to implement and fund alternatives to in-Bay disposal, and other relevant factors. Small dredgers should be exempted from allotments, but all dredgers should comply with policies 2 through 12.~~

Bay sediment is the basis of Bay habitats, has its own intrinsic value, and is subject to the public trust. To ensure that subtidal and intertidal habitats are available for current and future generations, sediment should be conserved to support these habitats.

2. Dredging of sediment for navigation, streambed maintenance, flood protection, and hydrologic connectivity shall ~~should~~ be authorized when the Commission can find: (a) the applicant has demonstrated that the dredging is needed to serve a water-oriented use or other important public purpose~~, such as navigational safety; (b) the materials to be dredged meet the water quality requirements of the San Francisco Bay Regional Water Quality Control Board (c) important fisheries and Bay natural resources would be protected through seasonal restrictions established by the California Department of Fish and Game, the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service, or through other appropriate measures~~; ~~(d)~~ (b) the siting and design of the project will result in the minimum dredging volume necessary for the project; and (c) the dredging would be conducted in a manner that is protective of Bay resources and minimizes impacts to habitat, fish and wildlife, such as by complying with environmental work windows established by the resource agencies, and/or other appropriate measures. ~~and (e) the materials would be disposed of in accordance with Policy 3.~~

3. ~~7.~~ All proposed channels, berths, turning basins, flood protection channels, streams, and other dredging projects ~~should~~ shall be carefully designed so as not to undermine the stability of any adjacent dikes, shoreline, ~~fills~~ or fish and wildlife habitats. Flood protection channels and streambed maintenance projects shall evaluate opportunities to improve water and sediment flow into adjacent wetlands, including developing low flow channels and widening floodplains to improve habitat features and support connectivity.

4. Beneficial reuse of dredged sediment protects public trust uses and meets public trust needs, and is the preferred alternative to disposal of dredged sediment as a waste product at aquatic sites in the ocean or in the Bay. The Commission should prioritize beneficial reuse of dredged sediment over aquatic disposal of the sediment in the ocean or in-Bay disposal sites. Disposal of dredged sediment at aquatic disposal sites in the Bay or ocean should be reduced to minimize the waste and unreasonable use of dredged sediment.

5. ~~To ensure adequate capacity for necessary Bay dredging projects and to protect Bay natural resources, acceptable beneficial reuse sites should be secured and the Deep Ocean Disposal Site should be maintained. Further, Dredging projects should use dredged sediment as a resource consistent with protecting and enhancing Bay natural resources, such as creating, enhancing, or restoring tidal and managed wetlands, and creating and maintaining levees and dikes, providing cover and sealing material for sanitary landfills, and filling at approved construction sites.~~

   Projects that propose to use sediment and soil within the Commission's jurisdiction for habitat purposes, aquatic placement, or disposal shall evaluate the suitability of sediment or soil for the proposed purpose. The Commission shall work with the San Francisco Bay Regional Water Quality Control Board, the USEPA, USACE, and other experts to ensure that appropriate standardized testing protocols are available and used to make suitability determinations.

6. ~~Dredged material disposed in the Bay and certain waterways should be carefully managed to ensure that the specific location, volumes, physical nature of the material, and timing of disposal do not create navigational hazards, adversely affect Bay sedimentation, currents or natural resources, or foreclose the use of the site for projects critical to the economy of the Bay Area.~~

   A dredging project that does not propose beneficial reuse of the project's dredged sediment shall include an evaluation of: (1) the availability of beneficial reuse sites for placement of the project's dredged sediment; (2) an alternatives analysis that compares the cost to transport and offload the project's dredged sediment at available beneficial reuse sites with the cost to dump the dredged sediment at an aquatic disposal site in the Bay or ocean; and (3) an estimate of the economic benefit and a description of any other benefits of the dredging project.

7. Dredged sediment shall be beneficially reused, and shall not be dumped as a waste at an aquatic disposal site, if beneficial reuse is reasonably capable of being done after taking into consideration:

   (1) whether the sediment is suitable for beneficial reuse;

   (2) whether there is an available beneficial reuse site;

   (3) the cost to transport and offload the dredged sediment at a beneficial reuse site in comparison to the cost to dispose of the dredged sediment at an aquatic disposal site;

   (4) the proposed dredging equipment (clamshell, excavator, or hydraulic) and offloading or disposal equipment;

   (5) the cost of the dredging project and any associated capital improvements;

(6) the economic benefit and any other benefits of the dredging project and any associated capital improvements; and

(7) any agreements between or among co-applicants for the dredging project and any associated capital improvements.

8. ~~The Commission should encourage increased efforts by soil conservation districts and public works agencies in the 50,000 square-mile Bay tributary area to continuously reduce soil erosion as much as possible.~~

The Commission shall maintain a list of available beneficial reuse sites, including restoration projects and sites suitable for beneficial reuse of dredged sediment or upland soil that have been identified by local Bay Area jurisdictions, information on the permitting status, and estimated capacity of the site and the ability to accept dredged sediment and excess upland soil of each listed site. The Commission shall post the list of available beneficial reuse sites and associated information for each site on the Commission's website. Bay sediment and excess excavated soils should be managed locally and regionally to prioritize and support habitat restoration and sea level rise adaptation projects. The Commission shall encourage cities and counties in the Bay Area that are preparing subregional shoreline adaptation plans pursuant to the Regional Shoreline Adaptation Plan to identify opportunities for beneficial reuse of sediment and excess upland soil in nature-based sea level rise adaptation projects. Pilot projects to test innovative techniques for beneficial reuse such as nearshore placement and water column seeding may be authorized if the project is found to be consistent with applicable policies in the Bay Plan.

9. ~~3.~~ Dredged ~~materials~~ sediment should~~, if feasible, be reused or disposed outside the Bay and certain waterways. Except when reused in an approved fill project, dredged material should~~ not be dumped in the Bay ~~and certain waterways~~ or the ocean as a waste unless ~~disposal outside these areas is infeasible~~ beneficial reuse is not reasonably capable of being done as determined in accordance with Sediment Management Policy 7 and the Commission finds: (a) ~~the volume to be disposed is consistent with applicable dredger disposal allocations and disposal site limits adopted by the Commission by regulation~~ any disposal in the Bay would be at a site designated by the Commission; (b) ~~disposal would be at a site designated by the Commission~~ the volume of dredged sediment to be disposed of in the Bay is consistent with any applicable disposal site limit or disposal allocation adopted by the Commission by regulation; (c) ~~the quality of the material disposed of is consistent with the advice of the San Francisco Bay Regional Water Quality Control Board and the inter-agency Dredged Material Management Office (DMMO)~~ any dredged sediment to be disposed of at a Commission-designated disposal site in the Bay is suitable for aquatic disposal consistent with standards identified through collaboration by the Commission and other resource agencies; and (d) the period and volume of

disposal in the Bay ~~is consistent with the advice of the California Department of Fish and Game, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service~~ protects Bay resources and minimizes impacts to habitat, fish and wildlife by complying with environmental work windows established by the resource agencies. Dredging projects that plan to dredge outside of the environmental work window should take sediment dredged outside of the work window to a beneficial reuse site or the same volume of sediment dredged outside of the work window to a beneficial reuse site within the next dredging season.

10. ~~4.~~If an applicant proposes to dispose of dredged ~~material~~ sediment ~~in~~ at an authorized in-Bay disposal site ~~tidal areas of the Bay and certain waterways~~ that exceeds either disposal site limits or any disposal allocation that the Commission has adopted by regulation, the applicant must demonstrate that the potential for adverse environmental impact is insignificant and that non-tidal and ocean disposal is infeasible because there are no beneficial reuse or alternative sites available or likely to be available in a reasonable period, or because the cost of disposal or beneficial reuse at alternate sites is prohibitive. ~~In making its decision whether to authorize such in-Bay disposal, the Commission should confer with the LTMS agencies and consider the factors listed in Policy 1.~~

~~11a. A project that uses dredged sediment to create, restore, or enhance Bay or certain waterway natural resources may be approved if:~~

~~(1) The Commission, based on detailed site-specific studies, appropriate to the size and potential impacts of the project, that include, but are not limited to, site morphology and physical conditions, biological considerations, the potential for fostering invasive species, dredged sediment stability, and engineering aspects of the project, determines all of the following:~~

~~(a) the project would provide, in relationship to the project size, substantial net improvement in habitat for Bay species;~~

~~(b) no feasible alternatives to the fill exist to achieve the project purpose with fewer adverse impacts to Bay resources;~~

~~(c) the amount of dredged sediment to be used would be the minimum amount necessary to achieve the purpose of the project;~~

~~(d) beneficial uses and water quality of the Bay would be protected; and~~

~~(e) there is a high probability that the project would be successful and not result in unmitigated environmental harm;~~

~~(2) The project includes an adequate monitoring and management plan and has been carefully planned, and the Commission has established measurable performance objectives and controls that would help ensure the success and permanence of the project, and an agency or organization with fish and wildlife management expertise has expressed to the Commission its intention to manage and operate the site for habitat enhancement or restoration purposes for the life of the project;~~

~~(3) The project would use only clean sediment suitable for aquatic disposal and the Commission has solicited the advice of the San Francisco Bay Regional Water Quality Control Board, the Dredged Material Management Office and other appropriate agencies on the suitability of the dredged sediment;~~

~~(4) Dredged sediment would not be placed in areas with particularly high or rare existing natural resource values, such as eelgrass beds and tidal marsh and mudflats, unless the material would be needed to protect or enhance the habitat. The habitat project would not, by itself or cumulatively with other projects, significantly decrease the overall amount of any particular habitat within the Suisun, North, South, or Central Bays, excluding areas that have been recently dredged;~~

~~(5) The Commission has consulted with the California Department of Fish and Wildlife, the National Marine Fisheries Service, and the U.S. Fish and Wildlife Service to ensure that at least one of these agencies supports the proposed project; and~~

~~(6) The project's design and goals incorporate the best available science on the use of dredged sediment for habitat projects.~~

~~(7) After a reasonable period of monitoring, if either:~~

~~(a) the project has not met its goals and measurable objectives, and attempts at remediation have proven unsuccessful, or~~

~~(b) the dredged sediment is found to have substantial adverse impacts on the natural resources of the Bay, then the dredged sediment would be removed, unless it is demonstrated by competent environmental studies that removing the material would have a greater adverse effect on the Bay than allowing it to remain, and the site would be returned to the conditions existing immediately preceding placement of the dredged sediment.~~

~~11b. To ensure protection of Bay habitats, the Commission should not authorize placement of more than a minor amount of dredged sediment for projects that are similar to the Oakland Middle Harbor Enhancement Area project in characteristics including, but not limited to, scale, bathymetric modification, and type of habitat creation, until The Oakland Middle Harbor Enhancement Area project is completed successfully.~~

~~11c. The Commission should encourage research and well-designed pilot projects to evaluate:~~

~~(1) The appropriate amounts of all habitat types within the Bay, especially for support and recovery of endangered species;~~

~~(2) The appropriate biological, hydrological, and physical characteristics of locations in the Bay for habitat creation, enhancement, and restoration projects that use dredged sediment;~~

~~(3) The potential for direct, indirect, and cumulative impacts of such projects;~~

~~(4) The effectiveness of different dredged sediment placement strategies for habitat restoration, enhancement, and creation; and~~

~~(5) The feasibility of the beneficial reuse of dredged sediment in the Bay and certain waterways for habitat creation, enhancement, and restoration.~~

11. ~~10.~~ Interested agencies and parties are encouraged to explore and find funding solutions for ~~the~~ any additional costs incurred by transporting and offloading ~~dredged~~ sediment ~~materials~~ to beneficial reuse ~~nontidal and ocean disposal~~ sites that support habitat and adaptation to rising seas, either by general funds contributed by ports and other relevant parties, dredging applicants, grant makers, financing programs, or otherwise.

12. The Commission should ~~continue to~~ participate in the Long Term Management Strategy and the Dredged Material Management Office as the basis for managing the navigation dredging program within the Bay, and work with the LTMS agencies in its periodic review and update. ~~, and~~ The Commission should ensure that coordination continues across LTMS and DMMO agencies to manage authorized in-Bay disposal site volumes, ensure capacity is available to different dredgers, protect Bay resources, support sediment transport processes, maintain appropriate water circulation, and ensure that navigation hazards are not created. The Commission should support ~~other~~ initiatives conducting research on Bay sediment movement, the effects of dredging and disposal on Bay natural resources, alternatives to Bay aquatic disposal, and funding additional costs of transporting dredged ~~materials~~ sediment to non-tidal and ocean disposal sites.

13. ~~9.~~ To protect ~~underground~~ fresh water reservoirs (aquifers) under the Bay or shoreline band: (a) all proposals for dredging or construction work that could penetrate the old Bay mud layer ~~" cover"~~ and damage aquifers shall ~~should~~ provide an analysis of the proposed project's depth and extent in relationship to the aquifer ~~be reviewed by the San Francisco Bay Regional Water Quality Control Board and the State Department of Water Resources~~; (b) ensure that the aquifer remains intact by providing an appropriate buffer; (c) provide data on groundwater conditions in the project area; and (d) be subject to consultation with the San Francisco Bay Regional Water Quality Control Board and the State Department of Water Resources. ~~; and (b) dredging or construction work should not be permitted that might reasonably be expected to damage an underground water reservoir. Applicants for permission to dredge should provide additional data on groundwater conditions in the area of construction to the extent necessary and reasonable in relation to the proposed project.~~

14. When excess upland soil from excavation projects is suitable for placement at wetland restoration projects, the Commission shall encourage its use to develop habitat features, raise site elevations, support tidal marsh establishment, and adapt to rising sea level.

15. The Commission shall support the restoration and adaptation of tidal marshes by encouraging the development of a land-based, regional sediment and soil stockpile system to support habitat and sea level rise adaptation. The Commission shall prioritize support for sediment and soil stockpile projects that:

    (a) Are located centrally to restoration sites such that they can supply soil to multiple restoration sites;

    (b) Are located near restoration sites where adjacent Bay shallowness makes delivery of dredged sediment by barge especially challenging;

    (c) Follow a testing protocol developed by the San Francisco Bay Regional Water Quality Control Board, BCDC, and other entities as appropriate to minimize impacts to habitat;

    (d) Screen and sort material in a manner that reduces the need for repetitive testing and prevents stockpiles from developing habitat;

    (e) Prioritize areas that would minimize impacts to habitat, such as landfills, transfer facilities, ports, maintenance yards, or other industrial sites;

    (f) Have a security system to prevent unauthorized dumping of soil or other materials;

    (g) Provide available public land, in and outside of the Commission's jurisdiction, for temporary, one-time, or long-term stockpiling of soil;

(h) Have an approved soil management plan to accept sediment and soil from multiple sources that would keep differently sourced soils separate, or provide for appropriate mixing per regulatory specifications; and

(i) Temporarily stockpile dredged sediment and/or upland soil at active and planned restoration sites.

16. The Commission shall encourage restoration projects proposing to transport sediment or soil by truck within an underrepresented, identified vulnerable, or disadvantaged community to collaborate with the potentially impacted communities and local governments to identify potential impacts of trucking and develop haul routes and minimization measures that would reduce potential disproportionate impacts on the identified vulnerable or disadvantaged communities.

17. The Commission shall encourage local governments and other agencies to collaborate to manage excess upland soil on a landscape scale to allow soil to flow most efficiently from sources to areas most in need.

Public Trust

Findings

a. Virtually all the publicly and privately-held unfilled tidelands and submerged lands within the jurisdiction of the Commission are subject to the public trust.

b. The public trust is a paramount public property right held in trust by the state for the benefit of the public.

c. Title to ~~this~~ lands subject to the public trust ~~ownership~~ is vested in the State Lands Commission or legislative grantees.

d. The purpose of the public trust is to assure that the lands to which it pertains are kept for trust uses, such as commerce, navigation, fisheries, wildlife habitat, recreation, and open space.

e. The McAteer-Petris Act and the Bay Plan are an exercise of authority by the Legislature over public trust lands and establish policies for meeting public trust needs.

f. As a result, the public trust ~~ownership~~ provides additional support for Commission decisions affecting such lands.

g. Dredging of sediment from lands subject to the public trust is necessary to meet public trust needs including navigation, commerce, and recreational boating.

h. As sea level continues to rise, it is necessary to preserve, restore, and enhance bay and shoreline habitats on lands subject to the public trust in San Francisco Bay and along its shoreline. By 2100, an estimated 450 to 650 million metric tons of sediment is needed to preserve, restore, and sustain bay and shoreline habitats and to adapt the shoreline to rising sea levels.

i. Sediment dredged from lands subject to the public trust in the Bay and its tributaries is a public trust resource.

j. Beneficial reuse of dredged sediment protects public trust uses and meets public trust needs by preserving and restoring Bay and shoreline habitats as ecological units to provide food and habitat for birds and wildlife and for scientific study, preserving and restoring tidelands and the shoreline for public enjoyment, including recreation, public access, and open space, and by increasing the resilience of Bay and shoreline habitats to rising sea levels and flooding. Beneficial reuse of dredged sediment on lands subject to the public trust is a public trust use of a public trust resource.

k. When dredged sediment is dumped at designated in-Bay disposal sites, the sediment is discarded as a waste and dissipates into adjacent deep-water channels and shoals. When dredged sediment is dumped at the deep ocean disposal site, it is discarded as a waste and entirely removed from the Bay system. Dumping of dredged sediment at aquatic disposal sites in the Bay or ocean precludes beneficial reuse of dredged sediment to protect public trust uses and meet public trust needs and constitutes waste and an unreasonable use of this public trust resource.

Policies

1. When the Commission takes any action affecting lands subject to the public trust, it should assure that the action is consistent with the public trust needs for the area and, in case of lands subject to legislative grants, should also assure that the terms of the grant are satisfied and the project is in furtherance of statewide purposes.

2. Beneficial reuse of dredged sediment protects public trust uses and meets public trust needs, and is the preferred alternative to dumping of dredged sediment as a waste at aquatic disposal sites in the Bay or ocean where there is no associated beneficial reuse. Dredged sediment shall be beneficially reused if beneficial reuse is reasonably capable of being done as determined in accordance with Sediment Management Policy 7. Dumping of dredged sediment at aquatic disposal sites in the Bay or ocean should be reduced to minimize the waste and unreasonable use of dredged sediment.

Clean Copy of BPA 1-26 Proposed Bay Plan Changes

A clean copy of the previously listed proposed changes is included on the following page, showing draft findings and policies with the strikethrough text removed, and the underlined text incorporated.

Summary

Major Conclusions and Policies

4. **Justifiable Filling.** Some Bay filling may be justified for purposes providing substantial public benefits if these same benefits could not be achieved equally well without filling. Substantial public benefits are provided by:

    g. Restoring, enhancing, or creating ecosystems using suitable sediment and soils that provide habitat for native fish, other aquatic organisms, or wildlife; enhance coastal resilience; and provide services such as water filtration, carbon sequestration, protection of shorelines from flooding and erosion, and raising the surface elevation of subsided land. Fill for these purposes will be especially important to facilitate the adaptation of habitats to rising sea level.

8. **Fill Safety.** Virtually all fills in San Francisco Bay are placed on top of Bay mud. Bay mud, depending on thickness, depth, and grain size, consolidates over time due to gravity, additional sediment deposits, and the weight of material placed on it. The construction of buildings on such fills creates a greater number of potential hazards to life and property, during normal settling and earthquakes, than does construction on bedrock or dense, hard soil deposits. Adequate design measures can be taken to reduce these potential hazards to acceptable levels.

Major Plan Proposals

1. **Develop Maritime Ports.** Port expansion and development should be planned for Alameda, Benicia, Oakland, Redwood City, Richmond, and San Francisco.
2. **Deepen Shipping Channels.** Major shipping channels from the Golden Gate to the Delta, and to Oakland, Redwood City, Richmond, and San Francisco should be deepened and the sediment should be beneficially reused, if the channels limit marine terminal activity and the deepening is economically and environmentally acceptable.
6. **Maintain Wildlife Refuges and Restore Diked Historic Baylands.** Prime wildlife refuges in diked-off areas around the Bay should be maintained and several major additions should be made to the existing refuge system. The refuge system is critical to health of the Bay, and additional diked Baylands should be restored to support Bay fish and wildlife and sea level rise adaptation. Because these areas were diked from the Bay, the land has subsided below sea level. When natural sediment supply is not sufficient to restore these important habitats and protect them from rising sea level, suitable upland soils and dredged sediment should be used to restore elevation and historic wetland habitat.

The Bay as a Resource

Fish, Other Aquatic Organisms and Wildlife

Findings

k. Tidal marshes and tidal flats are particularly vulnerable to inundation from sea level rise, changes in sediment supply, and lack of migration space. Current scientific predictions of sea level rise and declining sediment supply support the likelihood that many marshes and mudflats will not be able to adapt to these changes without human intervention. If marshes and mudflats do not accrete sufficient sediment and/or migrate to higher elevations, they may be lost or degraded by the end of the century. Placing sediment or soil in appropriate locations is necessary to ensure that species dependent on tidal marshes and tidal flats have sufficient habitat into the future. Placement of sediment and soil will be particularly important in subsided Baylands and tidal marshes to build transition zones, increase site and/or marsh plain elevation, and create high tide refugia. Placement of sediment may also be necessary in shallow intertidal or subtidal areas to increase mudflat elevation or to increase sediment transport to adjacent marshes to increase marsh plain elevation. Limited knowledge about deep water habitats makes it difficult to predict how major changes, including sediment placement, in these areas may adversely affect fish, other aquatic organisms, and wildlife.

l. Bay habitats are dynamic, ever-evolving systems that are predicted to change even more with sea level rise. For projects in which fill is proposed, the amount of fill required to ensure the persistence of these habitats into the future will depend on the rate of sea level rise and the time horizon of the project. As described in the San Francisco Estuary Institute's Sediment for Survival report (2021), large amounts of sediment will be needed to restore, sustain, and adapt marsh and mudflat elevations through the year 2100. Placement of large volumes of fill to assist existing habitats in adapting to long-term sea level rise projections may not be immediately necessary and may result in unnecessary near-term loss of habitat and other impacts to the Bay. Placing smaller volumes of fill incrementally could serve the function of facilitating habitat adaptation to sea level rise while also minimizing impacts of fill to fish, other aquatic organisms, and wildlife. Smaller environmental perturbations that are similar in scale to natural disturbance events, such as sediment deposition following a flood event, are often more likely to allow habitats to adapt and rebound than a major perturbation that could take much longer for habitats and species to recover. However, in some cases, a larger, single placement of fill may be more feasible or result in fewer impacts to Bay natural

resources. Prioritizing placement of large volumes of sediment in subsided Baylands prior to accelerated rates of sea level rise will help them reach marsh plain elevation and support wildlife habitat sooner.

m. The interface between fresh and marine water, or brackish water, is an extremely dynamic and productive area. The connection between many Bay tributaries and the Bay has been altered, reducing this unique and important transitional habitat. Wildlife uses these transitional areas for migration, foraging, growth, and spawning. Reconnecting creeks and streams and widening flood plains provide important opportunities for wildlife to access and use these limited habitats. Reconnecting these areas supports sediment transport and deposition on seasonal and tidal wetlands, helping them adapt to rising seas and expansion of Bay waters landward.

Water Surface Area and Volume

Findings

e. Some activities that maintain or expand Bay water surface area and volume can restore conditions that existed before the Bay was diked and filled. Although dredging increases Bay volume and surface area by removing sediment, it adversely impacts subtidal and intertidal habitat.

Tidal Marshes and Tidal Flats

Findings

p. Fill material, such as upland soil, rock, and sediment dredged from the Bay, can enhance or beneficially contribute to the restoration of tidal marsh and tidal flat habitat by: (1) raising areas diked from the Bay to an elevation that will help accelerate establishment of tidal marsh; and (2) establishing or recreating rare Bay habitat types.

Policies

6. Any habitat project should include clear and specific long-term and short-term biological and physical goals, success criteria, a monitoring program, and as appropriate, an adaptive management plan. Design and evaluation of the project should include an analysis of: (a) how the project's adaptive capacity can be enhanced so that it is resilient to sea level rise and climate change; (b) the impact of the project on the Bay's and local embayment's sediment transport and budget; (c) localized sediment erosion and accretion; (d) the role of tidal flows; (e) potential invasive species introduction, spread, and their control; (f) rates of colonization by vegetation; (g) the expected use of the site by fish, other aquatic organisms and wildlife; (h) an appropriate buffer, where feasible, between shoreline development and habitats to protect wildlife and provide space for marsh migration as sea level rises; (i) site characterization; (j) how the project adheres

to regional restoration goals; (k) whether the project would be sustained by natural processes, including whether additional sediment or soil should be considered as part of the restoration or adaptation strategy where natural sediment supplies are not sufficient; and (l) how the project restores, enhances, or creates connectivity across Bay habitats at a local, sub-regional, and/or regional scale.

Fresh Water and Sediment Flow

Findings

a. The Bay, Sacramento-San Joaquin River Delta, and ocean, are parts of an interconnected estuary system. Fresh water flowing into the Bay from the Delta and local tributaries dilutes the salt water of the Pacific Ocean flowing into the Bay through the Golden Gate. The Bay waters thus provide a gradual change from the salt water of the ocean to the fresh water flows of the Sacramento and San Joaquin Rivers. This delicate relationship between fresh and salt water helps to determine the ability of the Bay to support a variety of aquatic life and wildlife in and around the Bay.

b. The gradual change in the salt content of the Bay is necessary for the survival of anadromous fish such as Chinook and Coho salmon, steelhead, striped bass, and American shad as they progress upstream toward their spawning grounds and for the survival of their smolt as they descend to salt water. An abrupt change in the salt content of Bay water would probably end the anadromous fish runs.

c. The fresh water flow from the Sacramento and San Joaquin Rivers is an important source of the oxygen necessary in the waters of the Bay to support marine life and to abate pollution, and it assists in flushing parts of the Bay system, particularly during peak flows of the spring when the snows melt in the Sierra.

d. Fresh water flow into the Bay during the winter and spring months is of particular importance in maintaining the health of the Suisun Marsh, the largest remaining brackish marsh in the region and a waterfowl habitat of nationwide importance.

e. In addition to providing fresh water, the Delta and local rivers and creeks provide both fine and coarse grain sediment to the Bay though suspended and bedload transport. Sediment is a critical building block of habitat, including the subtidal Bay bottom, made up of approximately 80% mud, clay and silt, and 20% sands, with a limited amount of gravel. Like water, sediment is exchanged between the ocean and the Bay on a daily basis.

f. The flow of fresh water and sediment from the Delta and local tributaries bring critical sediment supply to the Bay. The sediment supply from these sources has been reduced by the construction of dams and water diversions of federal, state, and local

governments for agricultural, industrial, and domestic uses, as well as flood protection channels, tide gates, and streambed maintenance projects. Additional diversions are being sought, and further substantial diversions could change the salt content of Bay water and sediment supply to the Bay, thereby adversely affect the ability of the Bay to support a great variety of aquatic life.

g. Historically, the Bay had abundant sediment supply, but scientists have documented a significant decline in sediment supply to the Bay since approximately 1998. With the decrease in supply, the erodible sediment pool, or the amount of sediment that can be lifted into the water by currents and tides, has become more important. The Bay's erodible sediment pool was depleted in the late 1990s, which has limited the concentration of suspended sediment able to supply wetlands and mudflats (Schoellhamer, 2011).

h. In periodically reviewing existing diversions under its reserved jurisdiction, the State Water Resources Control Board issued Decision 1485 and the Delta Plan in 1978. The Decision and the Delta Plan set water quality standards for the Delta and the Suisun Marsh and continued to reserve jurisdiction over salinity control, fish and wildlife resources and coordination of the federal and state water projects so that the standards can be reviewed periodically. The Delta Plan noted that the protection of historical levels of fish and wildlife resources (1922-1967) should be the standard for future water diversions. In addition, the Delta Plan recognized for the first time, the State Water Resources Control Board's statutory responsibility to set standards for San Francisco Bay to protect beneficial uses of the Bay. Although the Board did not establish standards for the Bay because of a lack of information, the Board directed that studies be conducted to develop that information, the Board also determined that alternative water supplies must be found for the Suisun Marsh and completed by 1984. Although the Decision and the Delta Plan have certain flaws, such as their use of "without project" conditions as a standard at this time, and their inability to stop the decline in longfin and Delta smelt, steelhead, and salmon populations, the State Board has recognized the need to address these problems and has begun studies to that end. It is important that such studies be conducted expeditiously to preserve what remains of the fishery and to develop information about the Bay before vast sums of money are committed to water development projects that will reduce freshwater inflow to the Bay in the future.

i. The increasing rate of rising seas resulting from climate change will affect the amount of saltwater intrusion into the Delta and local tributaries, changing the way the Bay and Estuary function. The California Department of Water Resources controls large salinity gates in Suisun Marsh to reduce the flow of salt water upstream. Local governments may

request additional tide gates on local tributaries to reduce upstream flow of salt water. Constructing new tide gates restricts freshwater flow and sediment into the Bay from local sources. This could in turn reduce water, nutrient, sediment, and wildlife exchanged between the Bay and its tributaries, further stressing the ecological balance in the region.

j. The Commission's Bay jurisdiction extends to the head of tide in these areas with the exception of the specific tributaries identified as "certain waterway" jurisdiction in the McAteer-Petris Act. The head of tide is the extent to which tidal action moves in a creek or channel between lower low tide and higher high tide.

Policies

1. Diversions of fresh water and sediment shall not reduce the flow into the Bay to the point of damaging the oxygen content, freshwater exchange, or sediment supply of the Bay, the flushing of the Bay, or the ability of the Bay to support habitat and wildlife.
2. High priority should be given to the preservation of Suisun Marsh through adequate protective measures including maintenance of freshwater inflows.
3. The impact of diversions of freshwater inflow into the Bay should be monitored by the State Water Resources Control Board, which should set standards to restore historical levels (1922-1967) of fish and wildlife resources. The Bay Commission should cooperate with the State Board and others to ensure that adequate freshwater inflows to protect the Bay are made available.
4. Flood protection and streambed maintenance projects shall fully consider and, where possible, reconnect or realign tidal creeks to wetlands to supply sediment and provide more expansive floodplains for water absorption for both creek and coastal flooding. These projects should provide substantial net benefits for Bay habitats and native species, and short-term adverse impacts may be acceptable where over time the projects create more sustainable and functional habitat and flood systems.

Development of the Bay and Shoreline

Sediment Management

Findings

a. Prior to end of the last ice age, San Francisco Bay was a river system connecting the Sierra Nevada Mountains, the Central Valley, and the Coast Range to the Pacific Ocean. As the world warmed, sea level rose and drowned the river valleys to create the Bay.

Sediment from the land entered into the Bay primarily from the Sacramento and San Joaquin Rivers at an estimated rate of 1.71 million cubic yards (cy) (1.3 million cubic meters (cM)) annually (Holmes et al., 2023). Tides and currents also brought sediment into the Bay from the ocean. Today, the geomorphology and bathymetry of San Francisco Bay vary and include deep water channels, headland "pinch points" that constrain water and sediment flow, embayments, sand waves and ripples, shallow shoals, intertidal mudflats, tidal wetlands, and sandy beaches.

b. Because Native American tribes of the region have inhabited and stewarded the shorelines and waters of the Bay Area for over ten thousand years, valuable tribal cultural resources exist in Bay sediment and the shoreline. Tribes possess unique and valuable knowledge and practices for conserving and managing these resources in a sustainable manner.

c. Sediment provides stability, nutrients and minerals, affects water and air quality, supports biodiversity, and forms the foundation of tidal flats, marshes, and shorelines, which absorb water and buffer storms. Bay species are wholly dependent on it. Sediment directly supports wetland function. From supporting the microbes and plants that form the base of the food web, to being a stable place in the landscape for habitats to grow and flourish, the sediment that supports wetlands is a vital natural resource. Different types of sediment are found throughout the Bay sediment system, with the majority being fine-grained (clay, silt, and mud) and a smaller portion being coarse-grained (Schoellhamer, 2011; Barnard et al., 2013). The "sediment system" includes fine and coarse-grained sediment from the Sacramento-San Joaquin River Delta, within San Francisco Bay, exchange with the Pacific Ocean at the Golden Gate, upland construction, and local flood and stormwater control systems (McKnight et al., 2023).

d. In the 1800s, there were an estimated 500,000 acres of tidal wetlands in the Bay Area. Hydraulic mining for gold in California began in the 1850s when high-pressure water was jetted against deforested hillsides of the Sierra Mountains, sending nine times the pre-mining amount of sediment downstream to the Sacramento and San Joaquin River watersheds, and then into the Bay. Between 1849 and 1914, approximately 17.7 million cy (13.5 million cM) of mud, sand, and gravel was washed into the Bay annually until hydraulic mining was outlawed in the 1880s. In addition, people diked and drained wetlands for agricultural uses, built dams and aqueducts, placed fill in the bay, and diked land to produce salt and wetlands to hunt waterfowl.

e. The Bay Area has a history of modifying streams to facilitate development and protect urbanized areas from flooding. The San Francisco Estuary Institute's research has found that of the 353 historical creeks around the Bay, only 12% maintain their historical connection to the Bay. Most historic creeks were diverted into manmade channels, were routed underground, or were filled in completely.

f. As used in this Plan, **dredging** means removing sediment from an aquatic environment, whether in the Bay or its tributaries. Dredging is often necessary to provide and maintain safe navigation channels and turning basins with adequate under-keel clearance, harbors for port facilities, water-related industries, recreational boating, and flood control channels. Dredging removes existing subtidal habitat, impacting the organisms that live in and on it, and can disrupt surrounding areas.

g. Both mechanical and hydraulic dredges are used for navigation dredging in the Bay Area. Mechanical dredging is done by using a clamshell or excavator dredge to remove sediment and is most frequently used because it is readily available and less likely to entrain sensitive fish species. Mechanically dredged sediment can be placed in a scow and either bottom dumped or offloaded. Hydraulic dredges remove sediment by suctioning it through a draghead or cutterhead and pumping it onto a scow or into the hold of a hopper dredge. Hydraulic dredging provides an opportunity to pump dredged material directly to desired location if nearby and outfitted for this function, however the suctioning of water and sediment entrains fish and other organisms.

h. Industry, maritime activities, urban runoff, and waste disposal practices have deposited pollutants into the Bay, some of which have been absorbed by fine grain sediment. Coarse grain sediment is generally found in high energy areas and its nature makes it less likely to absorb contaminants. Due to varying types of industry, connections through waterways, and disposal practices, pollutants are not distributed evenly in the Bay. Some areas of the Bay are relatively free from contamination, while a few areas are highly contaminated with legacy pollutants on the surface and in deeper sediment. Testing sediment for potential contamination helps determine whether it can be beneficially reused or where it can be disposed.

i. Disposal of dredged sediment in the Bay had not been well managed. Up until the 1970's, dredged sediment was side-casted. In response to concerns that dredging and disposal were causing impacts to Bay habitats, state and federal agencies consolidated disposal to four state and federally authorized in-Bay disposal sites. These sites were designed to disperse the sediment into the adjacent naturally deep-water channels to move the sediment downstream towards the ocean. Three multi-user sites include the

Alcatraz (SF-11), San Pablo Bay (SF-10), and Carquinez Strait (SF-9), and one site, Suisun Channel (SF-16), dedicated to USACE use when dredging Suisun Channel. However, the Alcatraz did not function as expected and in the 1980s it mounded to within 30 feet of the surface and created a significant navigation hazard.

j. In response to scientific and environmental concerns, the Long Term Management Strategy (LTMS) program began, initiated by the U.S. Army Corps of Engineers (USACE) in partnership with the Commission, the San Francisco Bay Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board, and the U.S. Environmental Protection Agency (USEPA), with the involvement of dredgers, fishermen, environmentalists and other interested parties. The LTMS programmatically reduces in-Bay disposal, increases beneficial reuse, and manages dredging and in an environmentally and economically sound manner. In 2001, the LTMS Management Plan set goals for the region to reduce annual in-Bay disposal to one million cy or less and to place 40% of dredged material at beneficial reuse sites, 40% in ocean environments, 20% at in-Bay disposal sites. Decreasing in-Bay disposal made more sediment available to be used as a resource.

k. When the LTMS Management Plan was created, beneficial reuse sites were limited; to support the reduction of in-Bay disposal while beneficial reuse sites were in development, the USEPA designated the “San Francisco Deep Ocean Disposal Site,” (SFDODS) which is approximately fifty-five miles west the Golden Gate, 3,000 meters deep, and off of the continental shelf. The EPA and the USACE manage the site, with a yearly capacity of 4.8 million cubic yards of dredged material, and annual monitoring for impacts. It was considered an environmentally superior disposal site compared to in-Bay disposal due to the more sensitive estuarine waters compared to deep ocean environs. The site has been used for both clean sediment and sediment with more elevated levels of contamination to reduce or balance costs of beneficial reuse for dredging projects. However, in more recent years scientists and regulatory have recognized with the decrease in sediment supply and the more urge and extensive need for sediment in restoration projects, use of SFDOS removes sediment from the Bay sediment system. For this reason dumping of dredged sediment at the deep ocean disposal site should be discouraged due to the need for sediment at habitat projects within the Bay. However, instances occur when disposal of sediment at DODS is necessary.

l. The LTMS Program developed the Dredged Material Management Office (DMMO) as a joint interagency program staffed by BCDC, RWQCB, State Lands Commission, USACE, USEPA. The California Department of Fish and Wildlife, the National Marine Fisheries

Service, and the U.S. Fish and Wildlife Service also provide advice and expertise. The purpose of the DMMO is to collaboratively review sediment quality sampling and analysis plans, analyze test results, and make determinations as to whether sediment is suitable for beneficial reuse, or suitable for disposal in-Bay or SFDODS. Another goal of the DMMO is to increase efficiency and coordination between the agencies and foster a consolidated approach to dredged sediment management issues. The DMMO provides a single application form and unified processing of applications for dredging permits.

m. In 2001, the Commission adopted regulations, consistent with the LTMS in-Bay disposal goal, establishing target volumes for the reduction of in-Bay disposal of dredged sediment over time and a process for possible implementation of individual in-Bay dredged sediment allocations if the applicable target volume is exceeded. The regulations provide that the target volume for the calendar years after 2012 is an average of 1.25 million cubic yards per calendar year for each three year period.

n. Sediment continues to be removed from the Bay through the maintenance of navigational channels and flood control channels and streambeds. According to the San Francisco Estuary Institute's Sediment for Survival report (2021), over 3 million cubic yards of sediment is dredged for navigation purposes from the Bay annually since 1990. Between 2000 and 2020, approximately 60% of sediment dredged from the Bay was disposed of as waste at regulated disposals sites in the Bay and in the deep ocean. Between 2000 and 2013, 1.7 million cubic yards of sediment was removed from flood control channels. According to the San Francisco Estuary Institute's Changing Channels report (2017), approximately 60% of sediment removed from flood control channels is disposed of as waste.

o. Over time, human activities have disrupted the Bay's natural water flow and sediment system and have resulted in a decreased sediment supply to the Bay. This contributed to the loss of around 90% of wetlands in the Bay and has made it difficult for the remaining wetlands and restored sites to survive and adapt. Sand mining, like dredging, is a historical and ongoing activity that affects sediment supply dynamics in the Bay. The decline in sediment supply and the continued removal of sediment from the Bay system has led to a current period of sediment decline. Without a robust sediment supply, sea level rise threatens to flood tidal marshes and wetlands over time. To maintain elevation, large volumes of sediment will be needed. The region's suspended sediment supply is not sufficient to restore subsided areas to the necessary elevation or to keep pace with sea level rise. According to the San Francisco Estuary Institute's Sediment for

Survival report (2021), the Bay will need between 450 to 650 metric tons of sediment and soil to preserve, restore, and maintain wetland habitat, and adapt to rising sea levels through 2100.

p. In order to meet this demand, it is imperative for the region to retain the sediment already within the system through beneficial reuse. As used in this Plan, **beneficial reuse** means using dredged sediment to preserve and restore bay and shoreline habitats, preserve and restore tidelands and the shoreline for public enjoyment, increase the resilience of Bay and shoreline habitats to rising sea levels and flooding, or implement similar environmentally beneficial projects.

q. In March of 2025, the Commission published the collaboratively developed San Francisco Bay Sediment and Soil Beneficial Reuse Action Plan for Wetland Restoration and Adaptation (Action Plan). Among the Action Plan's 70 actions the region can take to address its sediment deficit, Action 2.4.2 directs the Commission to "Assess the San Francisco Bay Plan findings and policies regarding sediment supply and beneficial reuse to identify necessary improvements and propose amendments."

r. As used in this Plan, **excavation** means removing soil from an upland area. In areas upland from the Commission's jurisdiction, excavation projects around the Bay Area including general grading, creation of below-grade spaces, and maintenance of channels and streams often generate excess soil that is traditionally sent to landfills. Depending on an excavation project's location, excavation project managers can bring the soil for reuse at a wetland restoration site instead and reduce or avoid disposal costs.

s. Dredged sediment and excess soil from construction projects are critical natural resources that can be beneficially reused to help the region adapt to sea level rise. Fine-grain sediment from navigation dredging can be reused for wetland restoration and adaptation in subsided Baylands and on mudflats and marshes to raise elevation. Upland soil is more effective for stabilizing wetland restoration projects with levees, berms, ecotones, islands, upland refugia, and as general fill for adaptation projects. Excess upland soil has been used as for general fill at Bair Island, and in the construction of ecotones, flood protection levees, and islands at South Bay Salt Pond Restoration Project and South San Francisco Bay Shoreline Project.

t. As stated in Public Trust Finding i, sediment dredged from lands subject to the public trust is a public trust resource, and beneficial reuse of dredged sediment protects public trust uses and meets public trust needs by preserving and restoring Bay and shoreline habitats as ecological units to provide food and habitat for birds and wildlife and for

scientific study, preserving and restoring tidelands and the shoreline for public enjoyment, including recreation, public access, and open space, and by increasing the resilience of Bay and shoreline habitats to rising sea levels.

u. Reused dredged sediment has been successfully utilized in restoration projects in the Bay since 1994. In the Sonoma Baylands, a site that had been diked and drained for agriculture, wetlands were restored when dredged sediment was used to raise the marsh plain elevation, creating conditions that allowed the marsh to evolve naturally and revegetate. Other examples of restoration projects that incorporated beneficial reuse include Hamilton Wetlands, Montezuma Wetlands, and Cullinan Ranch. Reuse of excess upland soil began in earnest in 2018 at the Bair Island Restoration Project, and has become a more important resource as transitional habitat and ecotones have been incorporated into restoration projects.

v. Timing misalignments between upland soil availability and restoration sites readiness can be a barrier to the beneficial reuse of upland soil. Developing temporary, land-based stockpiles throughout the region to store soil for restoration projects can help make it available when restoration sites are ready to receive it. Double handling soil typically costs more than taking it directly to a restoration site. Stockpiling also presents challenges related to ownership and location, funding, site management and security, soil quality management, potential impacts on terrestrial habitat, and ability of stockpiles to develop into habitat while waiting for reuse opportunities.

w. For some restoration sites that are too shallow to receive sediment by barge or located far from dredging projects, transporting sediment and soil by truck, which can emit greenhouse gases, may be the only way to bring needed material to the site. When trucking is necessary, engagement with identified vulnerable or disadvantaged communities and local governments in the project area can help limit potential adverse impacts to the community.

x. Because oxygen levels vary between materials that have and have not remained submerged in water, testing protocols and suitability determinations for upland soil and dredged sediment are different. Due to differences in the testing requirements for different types of material, to reduce ecological risk, suitability determinations for placement in the Bay and shoreline band should be based on a collaborative testing protocol with coordination between the San Francisco Bay Regional Water Quality Control Board, the Commission, and other entities as appropriate.

y. Managing soil flow on landscape scales, rather than by city/county jurisdiction, may allow soil to flow more efficiently from sources to areas most in need and benefit ecosystems such as marsh and diked Baylands that extend across jurisdictional lines.

Policies

1. Bay sediment is the basis of Bay habitats, has its own intrinsic value, and is subject to the public trust. To ensure that subtidal and intertidal habitats are available for current and future generations, sediment should be conserved to support these habitats.

2. Dredging of sediment for navigation, streambed maintenance, flood protection, and hydrologic connectivity shall be authorized when the Commission can find: (a) the applicant has demonstrated that the dredging is needed to serve a water-oriented use or other important public purpose; (b) the siting and design of the project will result in the minimum dredging volume necessary for the project; and (c) the dredging would be conducted in a manner that is protective of Bay resources and minimizes impacts to habitat, fish and wildlife, such as by complying with environmental work windows established by the resource agencies, and/or other appropriate measures.

3. All proposed channels, berths, turning basins, flood protection channels, streams, and other dredging projects shall be carefully designed so as not to undermine the stability of any adjacent dikes, shoreline, or fish and wildlife habitats. Flood protection channels and streambed maintenance projects shall evaluate opportunities to improve water and sediment flow into adjacent wetlands, including developing low flow channels and widening floodplains to improve habitat features and support connectivity.

4. Beneficial reuse of dredged sediment protects public trust uses and meets public trust needs, and is the preferred alternative to disposal of dredged sediment as a waste product at aquatic sites in the ocean or in the Bay. The Commission should prioritize beneficial reuse of dredged sediment over aquatic disposal of the sediment in the ocean or in-Bay disposal sites. Disposal of dredged sediment at aquatic disposal sites in the Bay or ocean should be reduced to minimize the waste and unreasonable use of dredged sediment.

5. Projects that propose to use sediment and soil within the Commission's jurisdiction for habitat purposes, aquatic placement, or disposal shall evaluate the suitability of sediment or soil for the proposed purpose. The Commission shall work with the San Francisco Bay Regional Water Quality Control Board, the USEPA, USACE, and other experts to ensure that appropriate standardized testing protocols are available and used to make suitability determinations.

6. A dredging project that does not propose beneficial reuse of the project's dredged sediment shall include an evaluation of: (1) the availability of beneficial reuse sites for placement of the project's dredged sediment; (2) an alternatives analysis that compares the cost to transport and offload the project's dredged sediment at available beneficial

reuse sites with the cost to dump the dredged sediment at an aquatic disposal site in the Bay or ocean; and (3) an estimate of the economic benefit and a description of any other benefits of the dredging project.

7. Dredged sediment shall be beneficially reused, and shall not be dumped as a waste at an aquatic disposal site, if beneficial reuse is reasonably capable of being done after taking into consideration:

    (1) whether the sediment is suitable for beneficial reuse;

    (2) whether there is an available beneficial reuse site;

    (3) the cost to transport and offload the dredged sediment at a beneficial reuse site in comparison to the cost to dispose of the dredged sediment at an aquatic disposal site;

    (4) the proposed dredging equipment (clamshell, excavator, or hydraulic) and offloading or disposal equipment;

    (5) the cost of the dredging project and any associated capital improvements;

    (6) the economic benefit and any other benefits of the dredging project and any associated capital improvements; and

    (7) any agreements between or among co-applicants for the dredging project and any associated capital improvements.

8. The Commission shall maintain a list of available beneficial reuse sites, including restoration projects and sites suitable for beneficial reuse of dredged sediment or upland soil that have been identified by local Bay Area jurisdictions, information on the permitting status, and estimated capacity of the site and the ability to accept dredged sediment and excess upland soil of each listed site. The Commission shall post the list of available beneficial reuse sites and associated information for each site on the Commission's website. Bay sediment and excess excavated soils should be managed locally and regionally to prioritize and support habitat restoration and sea level rise adaptation projects. The Commission shall encourage cities and counties in the Bay Area that are preparing subregional shoreline adaptation plans pursuant to the Regional Shoreline Adaptation Plan to identify opportunities for beneficial reuse of sediment and excess upland soil in nature-based sea level rise adaptation projects. Pilot projects to test innovative techniques for beneficial reuse such as nearshore placement and water column seeding may be authorized if the project is found to be consistent with applicable policies in the Bay Plan.

9. Dredged sediment should not be dumped in the Bay or the ocean as a waste unless beneficial reuse is not reasonably capable of being done as determined in accordance with Sediment Management Policy 7 and the Commission finds: (a) any disposal in the Bay would be at a site designated by the Commission; (b) the volume of dredged sediment to be disposed of in the Bay is consistent with any applicable disposal site limit or disposal allocation adopted by the Commission by regulation; (c) any dredged sediment to be disposed of at a Commission-designated disposal site in the Bay is suitable for aquatic disposal consistent with standards identified through collaboration by the Commission and other resource agencies; and (d) the period and volume of disposal in the Bay protects Bay resources and minimizes impacts to habitat, fish and wildlife by complying with environmental work windows established by the resource agencies. Dredging projects that plan to dredge outside of the environmental work window should take sediment dredged outside of the work window to a beneficial reuse site or the same volume of sediment dredged outside of the work window to a beneficial reuse site within the next dredging season.

10. If an applicant proposes to dispose of dredged sediment at an authorized in-Bay disposal site that exceeds either disposal site limits or any disposal allocation that the Commission has adopted by regulation, the applicant must demonstrate that the potential for adverse environmental impact is insignificant and that non-tidal and ocean disposal is infeasible because there are no beneficial reuse or alternative sites available or likely to be available in a reasonable period, or because the cost of disposal or beneficial reuse at alternate sites is prohibitive.

11. Interested agencies and parties are encouraged to explore and find funding solutions for any additional costs incurred by transporting and offloading sediment to beneficial reuse sites that support habitat and adaptation to rising seas, either by general funds contributed by ports and other relevant parties, dredging applicants, grant makers, financing programs, or otherwise.

12. The Commission should participate in the Long Term Management Strategy and the Dredged Material Management Office as the basis for managing the navigation dredging program within the Bay, and work with the LTMS agencies in its periodic review and update. The Commission should ensure that coordination continues across LTMS and DMMO agencies to manage authorized in-Bay disposal site volumes, ensure capacity is available to different dredgers, protect Bay resources, support sediment transport processes, maintain appropriate water circulation, and ensure that navigation hazards are not created. The Commission should support initiatives conducting research on Bay

sediment movement, the effects of dredging and disposal on Bay natural resources, alternatives to Bay aquatic disposal, and funding additional costs of transporting dredged sediment to non-tidal and ocean disposal sites.

13. To protect fresh water reservoirs (aquifers) under the Bay or shoreline band: (a) all proposals for dredging or construction work that could penetrate the old Bay mud layer and damage aquifers shall provide an analysis of the proposed project's depth and extent in relationship to the aquifer ; (b) ensure that the aquifer remains intact by providing an appropriate buffer; (c) provide data on groundwater conditions in the project area; and (d) be subject to consultation with the San Francisco Bay Regional Water Quality Control Board and the State Department of Water Resources.

14. When excess upland soil from excavation projects is suitable for placement at wetland restoration projects, the Commission shall encourage its use to develop habitat features, raise site elevations, support tidal marsh establishment, and adapt to rising sea level.

15. The Commission shall support the restoration and adaptation of tidal marshes by encouraging the development of a land-based, regional sediment and soil stockpile system to support habitat and sea level rise adaptation. The Commission shall prioritize support for sediment and soil stockpile projects that:

    (a) Are located centrally to restoration sites such that they can supply soil to multiple restoration sites;

    (b) Are located near restoration sites where adjacent Bay shallowness makes delivery of dredged sediment by barge especially challenging;

    (c) Follow a testing protocol developed by the San Francisco Bay Regional Water Quality Control Board, BCDC, and other entities as appropriate to minimize impacts to habitat;

    (d) Screen and sort material in a manner that reduces the need for repetitive testing and prevents stockpiles from developing habitat;

    (e) Prioritize areas that would minimize impacts to habitat, such as landfills, transfer facilities, ports, maintenance yards, or other industrial sites;

    (f) Have a security system to prevent unauthorized dumping of soil or other materials;

    (g) Provide available public land, in and outside of the Commission's jurisdiction, for temporary, one-time, or long-term stockpiling of soil;

    (h) Have an approved soil management plan to accept sediment and soil from multiple sources that would keep differently sourced soils separate, or provide for appropriate mixing per regulatory specifications; and

(i) Temporarily stockpile dredged sediment and/or upland soil at active and planned restoration sites.

16. The Commission shall encourage restoration projects proposing to transport sediment or soil by truck within an underrepresented, identified vulnerable, or disadvantaged community to collaborate with the potentially impacted communities and local governments to identify potential impacts of trucking and develop haul routes and minimization measures that would reduce potential disproportionate impacts on the identified vulnerable or disadvantaged communities.

17. The Commission shall encourage local governments and other agencies to collaborate to manage excess upland soil on a landscape scale to allow soil to flow most efficiently from sources to areas most in need.

Public Trust

Findings

a. Virtually all the publicly and privately-held unfilled tidelands and submerged lands within the jurisdiction of the Commission are subject to the public trust.

b. The public trust is a paramount public property right held in trust by the state for the benefit of the public.

c. Title to lands subject to the public trust is vested in the State Lands Commission or legislative grantees.

d. The purpose of the public trust is to assure that the lands to which it pertains are kept for trust uses, such as commerce, navigation, fisheries, wildlife habitat, recreation, and open space.

e. The McAteer-Petris Act and the Bay Plan are an exercise of authority by the Legislature over public trust lands and establish policies for meeting public trust needs.

f. As a result, the public trust provides additional support for Commission decisions affecting such lands.

g. Dredging of sediment from lands subject to the public trust is necessary to meet public trust needs including navigation, commerce, and recreational boating.

h. As sea level continues to rise, it is necessary to preserve, restore, and enhance bay and shoreline habitats on lands subject to the public trust in San Francisco Bay and along its shoreline. By 2100, an estimated 450 to 650 million metric tons of sediment is needed to preserve, restore, and sustain bay and shoreline habitats and to adapt the shoreline to rising sea levels.

i. Sediment dredged from lands subject to the public trust in the Bay and its tributaries is a public trust resource.

j. Beneficial reuse of dredged sediment protects public trust uses and meets public trust needs by preserving and restoring Bay and shoreline habitats as ecological units to provide food and habitat for birds and wildlife and for scientific study, preserving and restoring tidelands and the shoreline for public enjoyment, including recreation, public access, and open space, and by increasing the resilience of Bay and shoreline habitats to rising sea levels and flooding. Beneficial reuse of dredged sediment on lands subject to the public trust is a public trust use of a public trust resource.

k. When dredged sediment is dumped at designated in-Bay disposal sites, the sediment is discarded as a waste and dissipates into adjacent deep-water channels and shoals. When dredged sediment is dumped at the deep ocean disposal site, it is discarded as a waste and entirely removed from the Bay system. Dumping of dredged sediment at aquatic disposal sites in the Bay or ocean precludes beneficial reuse of dredged sediment to protect public trust uses and meet public trust needs and constitutes waste and an unreasonable use of this public trust resource.

Policies

1. When the Commission takes any action affecting lands subject to the public trust, it should assure that the action is consistent with the public trust needs for the area and, in case of lands subject to legislative grants, should also assure that the terms of the grant are satisfied and the project is in furtherance of statewide purposes.

2. Beneficial reuse of dredged sediment protects public trust uses and meets public trust needs, and is the preferred alternative to dumping of dredged sediment as a waste at aquatic disposal sites in the Bay or ocean where there is no associated beneficial reuse. Dredged sediment shall be beneficially reused if beneficial reuse is reasonably capable of being done as determined in accordance with Sediment Management Policy 7. Dumping of dredged sediment at aquatic disposal sites in the Bay or ocean should be reduced to minimize the waste and unreasonable use of dredged sediment.