

COMMISSION BRIEFING

STATUS OF BAY DREDGING

NOVEMBER 1988

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION

OVERVIEW

Dredging is a fact of life in the shallow and sediment rich San Francisco Bay. While some dredging is needed to maintain flood control channels or to accommodate structures such as outfall lines or bridge abutments, most new and subsequent maintenance dredging is performed to provide for safe navigation and vessel berthing. Dredgers range from those maintaining their boat docks or small marinas, to federally-sponsored harbor deepening projects to accommodate deep-draft ships. Thus, the scale of Bay dredging projects ranges from tens to millions of cubic yards.

In recent years, dredging and disposal in the Bay has become increasingly controversial, most notably due to the accumulation of dredge spoils at the main Bay disposal site, but also due to a combination of factors that include an increased amount of proposed dredging, possible impacts on Bay fisheries, and concerns over dredging's role in Bay pollution and the adequacy of water quality tests.

The Commission has relied heavily on the Army Corps of Engineers (Corps) to identify and manage the technical problems related to Bay dredging and disposal. In recent years, the increasing controversy over and knowledge about Bay dredging problems, and the Commission's difficulty in obtaining necessary information regarding Bay dredging issues, has made it clear that the Commission may need to take a stronger role in managing Bay dredging and disposal. The problems confronting the Commission in its efforts to properly manage Bay dredging include: (1) a lack of adequate information on proposed dredging projects, their potential impacts, and information on natural Bay sediment dynamics against which the projects should be evaluated; (2) inconclusive research to evaluate alleged fishery impacts; (3) delays in designating an ocean disposal site; and (4) controversy over pollutant testing for dredged material.

In May, 1987 the Commission's staff produced a report on the mounding problem caused by the accumulation of dredged material at the disposal site near Alcatraz Island. This report updates the status of the Alcatraz problem in particular and Bay dredging issues in general, with recommendations for Commission action. The report begins with a background of Bay dredging and the Alcatraz mounding problem, discusses amounts of dredged material proposed for disposal, addresses dredging issues, reviews disposal options, identifies current Bay dredging initiatives, and concludes with recommendations for Commission action to respond to the problems identified in the report.

THE MOUNDING PROBLEM

For the past fifteen years, a 72-acre area near Alcatraz Island has been the disposal site for the majority of material dredged from San Francisco Bay. Today, the Alcatraz site is nearing capacity, but until feasible replacements can be found, it remains the only in-Bay site available for most Bay dredging projects.

Historically, there were many Bay disposal sites that were located mainly for convenience to dredging projects. However, to minimize sediments drifting back into dredged areas and to reduce disposal impacts on the Bay, by 1973 these sites were reduced to three; Alcatraz, Carquinez Straits, and San Pablo Bay (see Exhibit A). The Alcatraz site was chosen because it is subject to the full force of the tidal surge into and out of the Bay and, therefore, it was believed that, the disposed material would be swept away, with the maximum amount of material being carried out to the ocean. It was also chosen because of the site's proximity to major dredging projects. Similarly, the Carquinez Strait and San Pablo Bay sites are in areas of deeper water and subject to strong currents. They are also near to major dredging areas in the North Bay.

In 1982 it was discovered that not all the material disposed at the Alcatraz site was dispersing. Quite to the contrary, the material had formed a mound threatening navigation at a site originally 120 feet deep. Several reasons have been advanced as to why material is now accumulating at the site including: (1) the large volume of material disposed at the site; (2) possible reduced dispersion due to different types of disposed material and dredging techniques; and (3) possible reduction of current velocities at the site. While some of these factors affect the two other Bay disposal sites in Carquinez Strait and San Pablo Bay, material does not appear to be accumulating at these sites.

Since mounding was first detected, the Army Corps of Engineers has been managing disposal at Alcatraz to minimize the mounding problem. Peaks at the site have been evened out to ensure safe navigation. Dredgers are now required to: (1) more evenly distribute disposal around the 72-acre site; (2) dispose all material in an unconsolidated or slurried state, because the "soupier" the material, the greater the percentage carried away from the disposal site by the tides; and (3) submit post-project reports of dredging amounts. These measures have slowed mounding at Alcatraz, but it is probable that continued disposal at rates similar to those in the past will result in its eventual closure.

DISPOSAL PAST, PRESENT, AND FUTURE

It is difficult to determine the magnitude of past dredging in the Bay because Corps and Commission permits have not required post-project reports of actual dredging amounts. The Corps estimates that Bay dredging over the past twenty years has averaged eight million cubic yards per year; about two-thirds of which was maintenance dredging. The amount of material disposed at Alcatraz in 1986 and 1987, the two years since the Corps' surveying program

began, averaged a little over five million cubic yards. The amounts disposed in 1988 at the San Pablo Bay and Carquinez strait sites were about one million and one-half million cubic yards, respectively.

The largest dredger in the Bay is the Corps, which maintains navigation channels and performs federally-sponsored navigational and port improvement projects. The Navy and the Ports of Oakland and San Francisco constitute the other major Bay dredgers. Far more numerous are small dredgers such as marinas and flood control districts, although the volume of material disposed by small projects, as opposed to that contributed by the larger dredgers, has not been determined.

The volume of material proposed to be dredged in San Francisco Bay over the next several years is significantly higher than past dredging amounts. This increase reflects the continuing development of the Bay with navigation channel and port projects, and the steadily increasing volume and draft of cargo and naval ships which visit and berth in the Bay. In June of 1987, the Corps predicted that over fifty million cubic yards of material would be dredged from the Bay in the five year period from October, 1987 to September, 1992; the majority of which would be disposed at Alcatraz. This volume of dredging constitutes a significant increase over past dredging amounts. Due to a variety of impediments, most of which involve dredging issues addressed in this report, many of the new dredging projects have been delayed. However, all of these projects are still proposed. Although the Corps envisions no major new projects in FY89 (October, 1988 through September, 1989), about 2 million cubic yards of the Navy's 6.7 million cubic yards of dredging proposed for the FY89 period consists of new work.

The Corps estimates that yearly maintenance dredging in the Bay averages approximately 7.3 million cubic yards. Estimates of future maintenance dredging needs must be based on past amounts because there is little information on sedimentation patterns on which to base predictions, and often there is little advance notice by sponsors of when maintenance dredging will be performed. However, a recent Corps-sponsored study of shoaling rates for major federal projects shows declines at several facilities, indicating that changes may be occurring in Bay sediment dynamics. The extent and permanence of these changes has yet to be determined.

A preliminary analysis of the Commission's records of permits to Bay ports indicates that the Commission has granted permits allowing disposal of approximately 2 million cubic yards of mostly maintenance material at Alcatraz through 1992, for which no notification of completion is on file. Additionally, an estimated 4 million cubic yards of material has been authorized by the Commission through consistency determinations to the Corps and Navy. The total amount of material involved is approximately 6 million cubic yards.

Therefore, based on the available information, proposed Bay dredging for 1989 is estimated at approximately 8.3 million cubic yards with 2 million cubic yards of new work. The Commission has already authorized disposal of 6 million cubic yards of material for Alcatraz, and major new dredging projects can be expected in the near future.

DREDGING ISSUES

There are several Bay dredging issues of particular concern to the Commission. The most pressing of these is the ability of the Alcatraz site to accommodate continued disposal. The possible physical impacts of dredging and disposal on Bay resources, as alleged by Bay fisherman, constitutes an equally serious concern. Further, the role of dredging in redistributing pollutants in the Bay is an increasingly controversial issue. Finally, due to the impacts of the preceding three issues, the continued provision of dredging for necessary port and marina projects has itself become a serious issue.

1. Capacity At Alcatraz. As discussed above, material is accumulating at the Alcatraz site and the site may not be able to continue absorbing large amounts of material in the future. This raises the question, how much more material can be disposed at the Alcatraz site? The remaining capacity at Alcatraz is unknown because it depends on several varying factors: (1) the percentage of material dispersed during and soon after disposal; (2) the rate that material erodes from the site over time; and (3) the total allowed volume of the Alcatraz site, i.e. how close the top of the mound is allowed to come to the surface of the Bay and how much of the Bay bottom is covered by the base of the mound.

Much of the material disposed at the Alcatraz site will be swept away by currents; however, the amount of material remaining will depend, in part, on the nature of the material, the method of dredging and disposal, and the rate of disposal. First-time dredging often involves clays or sands that are very cohesive and consolidated, significantly lowering the amount of material that can be swept away by water currents. On the other hand, maintenance dredging of the silt that has settled into previously dredged areas results in lower retention rates. Dredging techniques also affect retention rates. Hydraulic dredging, by its very nature, creates a slurry of water and dredged material that optimizes dispersion, as opposed to clamshell dredging, that removes material in clumps. Consequently, clamshell dredgers are required to dispose material through metal grids in an attempt to break up the clumps and enhance dispersion. Finally, disposing large amounts of material over a short period of time may also contribute to accumulation, as disposed material becomes trapped under subsequent disposal episodes and thus cannot be dispersed by water currents.

Shifts in Bay dredging techniques, from hydraulic to clamshell dredging, may have accelerated mounding at Alcatraz. Increases in the volume of less dispersible new-work projects and possible reductions of current velocities at the site (due to human-induced and/or natural causes) may also have contributed to the mounding problem.

In June of 1988, Corps hydro-surveys indicated that approximately two to three million cubic yards of capacity remained at Alcatraz before the site would again become a hazard to navigation (assuming slopes similar to those currently at the site). Although retention rates for disposal at Alcatraz are subject to a high level of uncertainty, the Corps estimates

retention rates to range between forty percent for uncontrolled disposal, thirty percent for clamshell dredging, and approximately fifteen percent or less for slurried disposal of maintenance work.

Use of these figures gives a rough estimate that, between 5 and 20 million cubic yards of material could be disposed at Alcatraz. However, over time, additional material may erode from the site, providing greater capacity. For example, Corps estimates of capacity at Alcatraz have remained unchanged since June of 1987, although at least six million cubic yards of mostly maintenance work have been disposed in the interim. Changes in current flow at the Alcatraz site could also affect retention rates at Alcatraz. Finally, estimates of capacity at Alcatraz vary considerably depending on the total circumference of the mound. In essence, the Alcatraz site has become an expanding underwater mesa, and although the disposal area forming the top of the mound is limited to 72 acres, the bottom of the mound covers a far greater area. Based on present slopes, the mound's footprint at capacity may cover 300 to 500 acres, but gentler slopes would increase the volume and circumference of the mound.

Given the variability in dredged material retention rates and uncertainty over the magnitude of future dredging, it is impossible to predict when Alcatraz will reach capacity. It is also possible that Alcatraz may be able to handle smaller amounts of maintenance material indefinitely. However, Alcatraz cannot accommodate all the dredged material proposed from future Bay dredging projects, especially from large new dredging projects of consolidated material. Therefore, a large new project, coupled with ongoing maintenance disposal, could turn Alcatraz from a serious problem into a crisis. To reduce the risk that Alcatraz will not be available for important dredging projects, it is of critical importance to identify and implement acceptable alternatives to present disposal practices.

2. Physical Impacts. Dredged material disposal may cause adverse physical impacts to aquatic organisms in the water column and on the Bay bottom. The precise extent of the impacts on Bay resources from dredging and disposal is unknown due, in part, to the substantial lack of knowledge about Bay sediment processes. While it is known that a majority of disposed material has dispersed off the Alcatraz site, it is unknown where this material has gone. Originally it was thought that much of the material disposed at Alcatraz would pass out the Golden Gate on the ebb tides, never to return to the Bay system. However, several factors work to limit the amount of material swept out to sea. For example, strong ebb tides occur during only a small portion of the tidal cycle. For economic reasons, dredged material disposal occurs throughout the tidal cycle. Consequently, a good portion of dredged material is disposed while the tide is flooding past Alcatraz into the Bay. Also, most disposed material is quickly transported to the bottom, where dispersible material is then carried away by currents. Unfortunately, near the bottom of the Bay, net current flow is into the Bay rather than towards the ocean.

The precise movement of Bay currents and their effect on sediment movement is complex and not well understood. Therefore, it is difficult to estimate what percentage of disposed material remains in the estuary. Most agree that the majority of sediments likely remain in the Bay system and eventually are redeposited, often settling in dredged channels and basins from where they must be redredged.

a. Deposition. Bay fishing interests allege that material disposed at Alcatraz is covering areas in the Central Bay beyond the disposal site itself. They contend that areas that formerly were rocky or sandy are being buried in silt, resulting in the elimination of habitat for rockfish and other valuable fish species. Certainly, as material deposited at the Alcatraz site spreads over several hundred acres of the Central Bay, existing Bay substrate will be covered; however, it is not known what habitat may be buried by expansion of the disposal site's perimeter.

b. Changes in Water Circulation. It is unknown what changes in the circulation of Bay waters, if any, have been caused by the Alcatraz mound. It is possible that the size of the mound has affected currents at the site and may be contributing to the mounding problem. The San Francisco Bay Regional Water Quality Control Board's (Regional Board) staff has expressed concern that if significant shifts in Bay currents have been created by the mound, then adverse impacts to Bay resources may result.

c. Turbidity. Material resuspended into the water column by dredging and disposal increases water turbidity. Suspended sediments can physically harm organisms by abrasion, clogging gill and mouth organs, and causing mortality to sensitive life stages. Additionally, high turbidity may reduce light penetration and lower the productivity of aquatic Bay plant species, and, by reducing the sensory abilities of Bay fish species, impair their ability to find prey and/or reproduce. Bay fishing interests allege that increased turbidity has caused the remaining Bay sport and commercial fisheries to decline, not only by the mechanisms noted above, but also by causing schooling fish to disperse, migratory fish to avoid or pass rapidly through the Bay, and by causing fish to "go off the bite."

High turbidity is a naturally occurring phenomenon in the Bay. It is estimated by the Corps that an average of 170 million cubic yards of material is resuspended in the Bay yearly, dwarfing the amount of sediment entering from tributaries and that resuspended by dredging. However, turbidity varies with location and season. Little information exists on the pattern of natural turbidity in the Bay, and less on the changes to Bay turbidity caused by dredging and disposal. The Corps believes turbidity caused by dredging is negligible in comparison to naturally high turbidity conditions in the Bay. The California Department of Fish and Game has found data that indicate that turbidity in the Central Bay may have increased in recent years, during months that fishermen believe typically show reduced turbidity (May through June). Arguably, any observed increase in turbidity may be due to natural variability, and other factors may be impacting Bay fisheries, including water diversions, over-fishing, water pollution, and natural variability. Thus, while these allegations are serious, it is presently impossible to prove or disprove them.

The Department of Fish and Game believes that scheduling Bay dredging and disposal to avoid periods when aquatic organisms may be particularly at risk to turbidity impacts, such as during anadromous fish runs, may reduce the potential for adverse impacts to Bay fisheries.

3. Pollutant Impacts. Dredging and disposal can also can be a factor in redistributing pollutants. In the urbanized and industrialized Bay system, toxic pollution is a serious problem. Concern has been focusing on contamination of sediments, because pollutants can become concentrated in sediments, impacting both bottom dwelling organisms and Bay organisms coming into contact with suspended sediments. Dredging and disposal does not itself create pollution, but can redistribute polluted sediments to increase their pernicious effects on Bay organisms. Most dredging occurs in port and water-related industry areas supporting past and present sources of toxic substances, and in proximity to discharge points of polluted wastewaters from urbanized areas. Pollutant discharges from these sources can result in sediment contamination. Even recreational marinas and yacht harbors can pollute sediments by releases of toxic hull paints and oily wastes.

The state and federal pollutant testing programs are supposed to ensure that contaminated material will not be disposed in the Bay. The federal Clean Water Act requires comparison of pollutant levels in proposed dredging with conditions at the disposal site. These requirements are implemented by the Corps and the State and Regional Board, under the oversight of the Environmental Protection Agency (EPA). Unfortunately, sediments at the Alcatraz site may contain areas of contamination from past disposal episodes. This is of particular concern due to the dispersive nature of Bay disposal sites, because material disposed at these sites is distributed around the Bay. Although testing standards have been improved in the past several years and now include chemical testing of sediments and toxicity bioassays, evaluation of sediment toxicity is still evolving. There are presently no numerical criteria to judge pollutant levels in sediments. Decisions of sediment acceptability, therefore, must be based to a great extent on individual judgement. Further, comprehensive testing requirements are limited by the cost of gathering and testing samples and the absence of test organisms known to measure reliably Bay sediment toxicity.

Although the content and adequacy of testing procedures are still controversial, the Corps, EPA, and the Regional Board have informally agreed on a tiered testing program to evaluate pollution levels of proposed dredging projects. Because the Commission's staff does not have the resources to evaluate testing data, the Commission relies on the technical advice of the three agencies in sediment quality determinations. However, often this advice will not be available in time for consideration during the Commission's public hearing, or the information from the various agencies will conflict. The Commission may want to consider what measures need to be taken to improve the testing program for Bay dredging and coordination between the agencies regulating Bay dredging.

4. Access to Dredging. If the Alcatraz disposal site becomes unavailable, dredging may effectively be shut down in the south and central bays. Depending on the length of time until alternative disposal methods are

found, serious economic impacts would be felt by port and marina operators who rely on the Alcatraz site. These impacts could, in turn, result in impacts to the regional economy. The costs of non-Bay alternatives, such as ocean or Delta disposal, will be significantly more expensive. The extra costs will place a difficult burden on some dredging sponsors, especially small dredgers who may not have the resources to move dredged materials long distances and who cannot take advantage of the economies of scale of larger projects.

A related concern to dredging sponsors concerns the regulatory program itself. Recent changes in the requirements of those agencies regulating Bay dredging, adopted in response to emerging dredging problems, have resulted in considerable uncertainty for applicants. It is important that regulatory requirements be predictable and coordinated between the various agencies regulating dredging in the Bay.

The Commission is charged with developing the Bay and shoreline to their highest potential and has granted permits to port and marinas that are predicated on the continued availability of a disposal site for maintenance dredging. Therefore, the Commission is directly interested in assuring that continued options are available for dredged material disposal that are environmentally sound, reliable, practicable, and cost-effective. Although verifying information is not available, it is likely that the majority of small dredgers, who are the least able to afford ocean or delta disposal options, contribute the least amounts of dredged material. The special needs and limitations of small dredgers should be evaluated when adopting new dredging policies.

DISPOSAL OPTIONS

1. Ocean Site Designation. The Bay Plan policies on dredging state that, after upland disposal or use in approved fills, ocean disposal of dredged material is the most acceptable disposal method. There is presently no ocean site available for most Bay material because the site historically used lies in the Farallones Marine Sanctuary. The disposal site for the San Francisco Bay Bar Channel, can be used only to dispose of sand. Under the Marine Sanctuary Act, the Environmental Protection Agency (EPA) has the responsibility to designate new ocean disposal sites. Additionally, the Corps can designate a project-specific site subject to EPA concurrence.

The Corps and the EPA are presently working to designate a new ocean site. However, this process has been subject to continuing delays and controversy; it has been underway since the marine sanctuary was designated in 1981, and will not be completed for at least another two years. Studies necessary to identify potential sites are still underway. The National Marine Fisheries Service (NMFS), which has submitted a proposal to the Corps to conduct the research, estimates that at least 18 months of data must be collected to achieve a valid sample. The EPA estimates that environmental review for site designation will take an additional year. Based on these estimates, 1992 is the earliest date a new site could be designated.

The Port of Oakland's harbor deepening project illustrates the problems involved in ocean site designation. The Corps recently attempted to designate a project-specific ocean disposal site for the Port of Oakland's seven million cubic yard deepening project. The Corps had chosen a site, "1M" (see Exhibit A), approximately 17 miles from the Golden Gate in 140 feet of water. The EPA, resource agencies, fishing interests, and various environmental groups opposed this site due to concern over possible fishery impacts. After lengthy negotiations, agreement was reached to use a deeper site in 280 feet of water, "B1" (see Exhibit A), approximately 34 miles from the Bay. However, in order to avoid the Farallones Marine Sanctuary, the site chosen was only 13.5 miles from Half Moon Bay. Local fisherman, alleging that the site is a prime fishing area, successfully blocked its use by court order. The Port is presently conducting extensive testing to determine whether the dredged material is suitable for use in the Delta.

Fishing and environmental interests are now insisting that a site in very deep water off the continental shelf, over 1,000 fathoms, be designated as the ocean site (see Exhibit A). The closest such site would be over 40 miles from the Golden Gate, increasing significantly the costs and logistics of Bay dredging and disposal.

The EPA-Corps study will likely include possible ocean sites both on and off the continental shelf. This process will probably continue to be controversial. Fishing and environmental groups may oppose sites on the shelf. While the ocean site designation is a federal process, the California Coastal Commission may become involved in the process through its federal Coastal Zone Management Act authority, if the site designation directly affects the coastal zone. Further, the State and Regional Boards would have jurisdiction if the designated site lies within the three mile limit of state waters. Finally, once an ocean site is designated, the Corps may choose not to fund the extra expenses incurred by use of a deep-water site (or perhaps other ocean disposal sites) given the implementation of the Corps' "federal interests" test to allocate the federal share of local dredging projects.

2. Continued In-Bay Disposal. A new site or sites in the Bay could be designated for disposal. However, all such sites would share, to a greater or lesser extent, the problems plaguing Alcatraz. To the extent material accumulated at these sites, further mounds of disposed material would result. The effect of these mounds on Bay circulation patterns and their impact on Bay resources is unknown. To the extent material dispersed off these sites, they would be subject to the same allegations concerning water turbidity, habitat smothering, increased maintenance dredging needs in surrounding areas, and potential pollutant remobilization, presently facing the Alcatraz site. Finally, the disposal sites would likely lose much of any present habitat value because an ongoing disposal site typically has low habitat value.

Redredging of material from in-Bay sites could be used to lesson or prevent mounding, and would require a second disposal site. The most obvious candidate would be an ocean disposal site. This approach has the advantage that all dredgers could dispose in-Bay and pay a fee towards the Corps'

rehandling of accumulated material. However, by doubling dredging and disposal, it would likely increase impacts on Bay resources as well as creating impacts at the second disposal site.

Creation of intertidal habitat and habitat islands could be another use of dredged materials. The potential impacts of this alternative raise concerns for the Commission. Locally, habitat islands would change Bay resources, affect water circulation and reduce tidal flushing, affect sedimentation rates, and could even affect local atmospheric conditions. In order to absorb a significant fraction of Bay disposal needs, the large areas that would be affected could result in adverse cumulative impacts. Therefore, it cannot be assumed that the benefits of these projects would outweigh their adverse impacts. Extensive study of the need for, and impacts of, this approach would be necessary before the Commission could consider such projects.

3. Upland Disposal. Historically, significant amounts of dredged material were used to fill the Bay to create upland areas. Few locations now exist around the Bay that could accept dredged material without significant environmental impacts. Most non-developed areas around the Bay margin are diked historic baylands supporting seasonal wetlands or other habitat values important to the Bay's resources. The Commission has stated its firm opposition to filling these areas in its diked historic bayland policies, and proposals to fill diked wetlands for disposal of dredged material would likely face opposition from many sources. Some dredged material may be used in mitigation projects to create suitable elevations for the development of tidal wetlands in diked areas returned to tidal action. However, such projects will not be able to absorb the large amounts of material dredged from the Bay.

It may be possible to find an acceptable upland area to site a dredged material processing area, where material could be dried for export to other areas. Drying and desalting dredged material significantly increases its value, and such a site may provide both a long-term disposal site and a useful product. More speculatively, slurry pumping techniques may enable disposal areas to be sited further inland than previously feasible, and could be a source of material to cap dump sites or for other uses upland of the diked historic baylands.

4. Delta Disposal. Many of the Delta islands have subsided below sea level and the levees protecting them from inundation are seriously deteriorated. Dredged material from the Bay could be used to strengthen Delta levees and even to raise the level of Delta Islands. Because a large percentage of the Bay's sediments originally came from the Sacramento and San Joaquin watersheds via the Delta, they may prove acceptable for use in the Delta. The costs of transporting dredged material to the Delta may be comparable to ocean disposal costs, but while disposal in the ocean would, at best, have negligible impacts, use in the Delta could provide a significant public benefit. The biggest questions concerning Delta use of Bay sediments, besides costs, are salinity and possible contamination problems. While control of salinity may be more problematic, a pollutant testing program could be instituted that would identify material unsuitable for use in the Delta.

Such projects would require close cooperation with the Central Valley Regional Water Quality Control Board and other responsible agencies. The U. S. Fish and Wildlife Service is currently using Delta dredged material to create needed inter-tidal wetland habitat, and, as mentioned previously, the Port of Oakland is presently pursuing a plan to use material from its deepening project for levee repair on Twitchell Island in the Delta.

5. Reduce Dredging Needs. As dredging and disposal becomes more problematic and expensive, dredging sponsors will look more carefully at methods to reduce the need for dredging. These may be straightforward, such as reducing channel size to the minimum needed for safe navigation, or high technology, such as the array of scouring devices that the Navy has been testing at Mare Island. Palo Alto decided to close its municipal yacht harbor rather than absorb the costs associated with the large volume of dredging the harbor required.

Careful siting and layout of dredged areas can reduce new and maintenance dredging needs. Breakwaters and groins may be proposed to reduce migration of sediments into dredged areas. The Navy is presently considering just such a structure at the Alameda Naval Air Station. The Commission may want to consider enlarging the scope of its present policy regarding siting of marinas in areas requiring large amounts of dredging, to all Bay projects requiring dredging, and to require design measures that minimize dredging needs.

It is likely that some combination of these and other alternatives will be instituted to reduce reliance on the Alcatraz disposal site. For example, it may be determined that Alcatraz can continue to be used for small amounts of maintenance dredging material indefinitely, with little or no adverse impacts and, consequently, should be reserved for small dredging projects. However, new work and large maintenance projects may require ocean or Delta disposal.

CURRENT AND PLANNED DREDGING INITIATIVES

1. Corps of Engineers. The Corps, in addition to being the largest dredger in the Bay, is the main federal agency regulating dredging and disposal in San Francisco Bay. The Corps is presently preparing a long-range dredging plan to guide its regulatory and dredging activities in San Francisco Bay, called the Dredged Material Disposal Management Plan (DMP). The Plan is intended to address all aspects of Bay dredging and disposal; however, the Corps does not expect to complete the DMP until 1992. To provide a factual basis for the plan, studies are being prepared that include: (1) ocean, upland, and in-Bay alternatives to use of the Alcatraz site; (2) computer-modeling of dredged material disposal at Alcatraz; (3) Bay shoaling rates; (4) impacts of disposal on fisheries; (5) contamination at the Alcatraz site; and (6) methods to reduce dredging needs. In the 1970's, the Corps performed a similar group of studies entitled the "Dredge Disposal Study." These studies were performed in response to concerns about the impact of Bay dredging. The Corps' present DMP program is intended, in part, to help the Corps respond to renewed dredging concerns.

To provide input to the Corps' preparation of the Management Plan, the Corps formed an advisory committee composed of representatives from dredgers, concerned regulatory and resource agencies, and environmental and fishing interests. A representative from the Commission's staff sits on the Corps' advisory committee.

2. State and Regional Boards. The State Water Resources Control Board (State Board) and the Regional Water Quality Control Board, San Francisco Bay Region (Regional Board), also regulate dredged material disposal in the Bay. Under the federal Clean Water Act, the State or Regional Board issues certification that federal dredging permits meet state water quality standards. Additionally, under state law, the Regional Board can require waste discharge permits for dredge disposal projects. At its September 21, 1988 meeting, the Regional Board directed its staff to prepare quantity and quality limits for in-Bay disposal for possible adoption by the Board. The limits are intended to ensure the protection of Bay water quality. The Regional Board staff presently anticipates bringing proposed limits for Board consideration in early 1989.

3. Environmental Protection Agency. The federal Environmental Protection Agency (EPA) oversees Corps implementation of the federal permit program for dredging and is responsible for designating ocean disposal sites. Additionally, San Francisco Bay has recently been included in the EPA's national estuary program. The goal of the program is to prepare a Comprehensive Conservation and Management Plan (CCMP) to restore and maintain the health of the Nation's ailing Bay's and estuaries. As part of the program for San Francisco Bay, a dredging and waterway modification component has been initiated that is intended to address dredging impacts on the estuary. The current effort is addressed only at identifying the status and trends of Bay dredging and includes no new research. Data gaps will be identified in the present effort, and funds may later be available for research as part of the estuary project. The Commission's staff is represented on the technical advisory committee for the dredging component, as well as on the Estuary Project's management committee. The CCMP will be subject to consistency review by the Commission, under the federal Coastal Zone Management Act. The finalized CCMP may need to be incorporated into the Commission's federally-approved management program pursuant to a recently executed memorandum between EPA and the Department of Commerce.

4. National Marine Fisheries Service. NMFS has submitted to the Corps an outline of a study which would provide resource information necessary to the ocean site designation process. NMFS administers the Farallones Marine Sanctuary and has substantial expertise in resource analysis and management of ocean areas. The proposal is under consideration by the Corps.

5. Congressional Delegation. The Bay Area congressional delegation has taken a strong interest in Bay dredging issues. Most recently, the delegation requested that the General Accounting Office prepare a study that will look at Bay dredging practices and their impact on the estuary.

RECOMMENDATIONS

The McAteer-Petris Act and the Bay Plan authorize the Commission to regulate dredging and disposal in San Francisco Bay. Further, the Commission's law and policy requires the Commission to foster development of the Bay while protecting the Bay's resources. The Commission's responsibilities overlap but are distinct from those of other agencies regulating Bay dredging. For example, the Regional Board is primarily charged with maintaining Bay water quality, and the Corps is charged with representing the federal interest in Bay dredging projects and implementing the federal permit program. The Commission cannot be assured that the actions taken by other agencies implementing their laws and policies will also reflect the balancing of interests required by the Commission's law and policy. Further, because of the pressing and serious nature of present dredging issues, the Commission cannot wait for completion of long-term studies before considering changes to its dredging program, but must take appropriate actions to manage Bay dredging based upon the best available information. Finally, the Commission should assure that its dredging policies and program are up to date, in order to initiate new measures concerning Bay dredging it deems appropriate and to be able to adequately respond to initiatives proposed by others. Therefore, the staff recommends that the Commission take the following actions:

1. Update Bay Plan Dredging Policies. The Commission should update the dredging findings and policies in its Bay Plan, as presently scheduled in the Commission's work program. Updating the dredging policies will allow the Commission to incorporate new information concerning Bay dredging and better respond to current policy issues surrounding Bay dredging and disposal. To begin that process and to ensure adequate notice of the Commission's intention to do so, the staff recommends that the Commission approve the attached brief descriptive notice of Commission consideration of possible changes to the Bay Plan dredging findings and policies.

A descriptive notice is the first step in the process of amending the San Francisco Bay Plan. Notice of a proposed amendment is required by the McAteer-Petris Act (Government Code Section 66652) and Section 11000 of the Commission's regulations (California Administrative Code, Title 14, Division 5), and must be mailed to all interested parties at least 30 days prior to a Commission hearing on the matter. If the attached proposed notice is approved by the Commission at its December 1, 1988 meeting, it would be mailed on December 2, 1988 and a public hearing could be held on January 5, 1989.

However, the staff recommends that the Commission wait a full year to hold the public hearing after distributing the descriptive notice (i.e. until January, 1990), to ensure that more than adequate time is available for the public and interested parties to prepare comments. The staff will distribute a report to all Commissioners, Alternates, and interested parties at least 30 days prior to the public hearing. The staff report would contain the specific wording of proposed changes to the Bay Plan findings and policies concerning dredging, although the attached proposed notice contains the scope

of the proposed changes. Upon conclusion of the public hearing, and at least six days after submission of the Executive Director's final written recommendation, the Commission can vote upon the proposed change.

2. Designate An Ocean Site. A new ocean disposal site should be designated as soon as possible for non-polluted material dredged from San Francisco Bay. Because the designation process is a federal matter outside of the Commission's jurisdiction, the staff recommends the Commission direct the staff to prepare a letter for the Chairman to send to the EPA, the Corps, the California Coastal Commission, and the Bay Area Congressional delegation, requesting early federal designation of an ocean disposal site that is environmentally and economically acceptable.

3. Sediment Study. The many gaps of factual information necessary to understanding the impacts of dredging and disposal in the Bay, highlights the importance of immediate focused research on Bay sediment dynamics. This information is needed to evaluate the adequacy of the Commission's policies regarding dredging and the Commission's program to manage and protect the Bay. Specifically, information is lacking on: (1) sediment movement into, within, and out of the Bay and the effect of dredging on Bay sediment dynamics; (2) the turbidity dynamics of the Bay and the changes in Bay turbidity caused by dredging; (3) the impact of dredging on Bay resources; and (4) the role of dredging in circulating pollutants in the Bay and possible impacts of pollutants on Bay organisms. This information is vital, not only to the Commission but to the Corps, Regional Board, EPA, Bay dredgers, and all parties interested in supporting water-oriented uses while protecting the Bay environment. The staff will continue to promote and coordinate studies on Bay sediment dynamics and other dredging issues, as set out in the Commission's current work program.

To aid in this study and the Commission's dredging program, the Commission should establish an advisory body to the Commission on technical issues relating to Bay dredging, composed of scientists, engineers, and coastal managers with the necessary technical background to review dredging issues. The Commission's sediment study should be closely coordinated with the EPA Estuary Project, the Corps' Dredged Material Disposal Management Plan, and other similar initiatives.

4. Coordinated Dredging Program. The Commission should work with all parties to assure the availability for necessary Bay dredging projects of disposal alternatives that are feasible and protect the Bay's resources. In particular, the Commission should work with other Bay regulatory agencies to ensure that regulation of Bay dredging is straight-forward, effective, and predictable. This coordination may take the form of Memoranda of Understanding (MOU) stating unified regulatory requirements for testing and disposal, and methods to resolve any disagreements between agencies.

5. Interim Actions. At this time, the Commission should require as condition of all dredging permits, post-dredging information on actual areas and volumes dredged. This information will allow the Commission to better track Bay dredging and disposal. Further, the Commission should direct the staff to request the Department of Fish and Game, the Fish and Wildlife

Service, and the National Marine Fishery Service to submit their advice on the need for conditioning dredging permits to avoid fishery impacts. These reports should include the rationale for any requirements, the existing technical basis, and any further information needed to verify or disprove the need for recommended conditions.

In the interim period until the Commission can consider and possibly adopt new policies concerning dredging, the Commission should: (a) limit dredging permits to one year in length and emphasize non-Bay disposal for new projects or large maintenance projects; (b) direct the staff to prepare a letter for the chairman to send to the Corps, Navy, and Ports advising them to postpone new dredging projects and large maintenance dredging projects involving disposal at Alcatraz until 1993, when an ocean disposal site should be available and the Corps' DMP and the EPA's CCMP are expected to be completed; and (c) direct the staff to request the Bay Area congressional delegation to fund analysis of practicable and environmentally sound non-Bay disposal options, and, further, to restrict funding by federal dredging projects to those without Bay disposal.

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION
Thirty Van Ness Avenue, San Francisco 94102 557 - 3686

December 2, 1988

DESCRIPTIVE NOTICE OF POSSIBLE BAY PLAN AMENDMENT
NO. 4-88 CONCERNING DREDGING AND DISPOSAL IN
THE SAN FRANCISCO BAY

NOTICE is hereby given that the San Francisco Bay Conservation and Development Commission will consider the request of the Executive Director to amend the Bay Plan findings and policies relating to dredging and disposal in San Francisco Bay.

A HEARING on the possible amendment will be held no sooner than March 16, 1989 in the State Building, Room 1194, 455 Golden Gate Avenue, San Francisco, California, starting at 1:00 p.m. At least thirty days prior to the public hearing, the staff will prepare and mail a staff report on the proposed changes, which will set the date of the public hearing. Interested persons may request the staff report and present written comments on or before the date of the public hearing.

This NOTICE is prepared in conformance with Section 66652 of the Government Code, Section 11000 of the Commission's regulations, and Section 312 of the federal Coastal Zone Management Act of 1980. If, after the hearing, the Commission adopts an amendment to the San Francisco Bay Plan as described in this notice and subsequent staff report, such amendment will be processed as routine program implementation for the federally-approved coastal management program for San Francisco Bay. Any interested federal agency should, therefore, comment to the Commission on or before the date of the public hearing.

The Commission will consider the following changes to the Bay Plan Dredging findings: (1) delete inaccurate or outdated information; (2) state the necessity of dredging to develop the Bay; (3) identify known and probable impacts on Bay resources from dredging and disposal; (4) identify alternatives to disposal of material in the Bay; (5) identify measures that can reduce Bay sedimentation from dredged material disposal; (6) identify measures that can reduce the impact to Bay resources from dredging and disposal; and (7) state the importance of obtaining information on dredging projects, sediment dynamics in the Bay, impacts of dredging on Bay resources, the relationship of dredging to Bay pollution, and other information vital to the Commission's ability to protect and develop the Bay.

The Commission will consider the following changes to the Bay Plan Dredging policies: (1) delete inaccurate or obsolete policies; (2) state measures to minimize Bay sedimentation from dredged material disposal that may include: (a) ending or limiting Bay disposal; (b) ranking dredging projects according to their regional importance; and (c) establishing new siting and

design specifications for Bay projects to minimize dredging needs; (3) provide new specifications for method, location, timing, testing, informational requirements, and volume of Bay disposal to protect Bay resources and manage disposal sites; (4) encourage the Legislature and others to work towards providing non-Bay disposal sites that are practicable and environmentally acceptable; (5) coordination of the Commission's dredging program with other agencies; and (6) increase the Commission's support for that research on Bay processes and dredging impacts which would improve the Commission's program to protect Bay resources.

Whether the Bay Plan findings and policies should be changed as described above, and in what manner, will be the subject of the public hearing and Commission deliberations.

Further information on the proposed amendment and the possible environmental impacts can be obtained by contacting Steven Goldbeck at the Commission's Office, Thirty Van Ness Avenue, Suite 2011, San Francisco, CA 94102, telephone (415) 557-3686.