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November 10, 2010

Sean Randolph, Chairman
Will Travis, Executive Director
San Francisco Bay Conservation and Development Commission
50 California St., Suite 2600
San Francisco, CA 94111

Dear Chairman Randolph and Director Travis:

Thank you for the opportunity to comment on BCDC's proposed Bay Plan Amendments. SPUR, the San Francisco Planning and Urban Research Association, has been engaged in planning for climate change for several years. We commend your agency's leadership on sea level rise planning in the Bay Area. As promised in our letter to the Commission dated October 21 and public testimony on November 2, we are pleased to suggest changes to the proposed amendments in the memo below.

SPUR believes that it is possible both to encourage true urban infill development in the right locations, and to meaningfully plan for sea level rise, and that there are some changes that should be made to the amendments to ensure that we all proceed on the right path. We encourage BCDC to make the following changes to the Bay Plan:

1. Define "infill development" to include: underutilized land within urbanized areas that are served by existing infrastructure including transit, conversion of former military bases, adaptive reuse of existing structures, and ABAG Priority Development Areas;
2. Encourage local governments, and the Commission within its jurisdiction, to allow infill projects to proceed, and others if have an adaptation and financial strategy, while a regional sea level rise strategy is being developed;
3. Provide formal assurances in new findings clarifying that the proposed amendments do not expand the Commission's jurisdiction;
4. Provide assurances to give certainty to activities that may be undertaken in the future that are within the scope of an existing permit;
5. State that BCDC should work with other agencies and local governments to identify long-term regional flood protection strategies and create consistency with SB 375 sustainable communities strategies.

Again, we thank you for your leadership on this important issue and for taking steps to improve your guidance to the region on how we should manage future sea level rise.

Sincerely,

Gabriel Metcalf
Executive Director

Tidal Marshes and Tidal Flats	
Findings	**Staff Analysis**
Add underlined language and delete struck-through language as follows: g. The Baylands Ecosystem Habitat Goals report provides a regional vision of the types, amounts, and distribution of wetlands and related habitats that are needed to restore and sustain a healthy Bay ecosystem, including-restoration of 65,000 acres of tidal marsh. <u>These recommendations were based on conditions of tidal inundation, salinity, and sedimentation in the 1990s. While achieving the regional vision would help promote a healthy, resilient Bay ecosystem, global climate change and sea level rise are expected to alter ecosystem processes in ways that require new, regional targets for types, amounts, and distribution of habitats.</u>	The finding has been updated to reflect the currency of the Habitat Goals and the potential need to update them in light of new information regarding climate change.
Add underlined language and delete struck-through language as follows: i. Tidal marshes are an interconnected and essential part of the Bay's food web. Decomposed plant and animal material and seeds from tidal marshes wash onto surrounding tidal flats and into subtidal areas, providing food for numerous animals, such as the Northern pintail. In addition, tidal marshes provide habitat for insects, crabs and small fish, which in turn, are food for larger animals, such as the salt marsh song sparrow, harbor seal and great blue heron. <u>Diking and filling have fragmented the remaining tidal marshes, degrading the quality of habitat and resulting in a loss of species and an altered community structure.</u>	The finding has been updated to include impacts from past activities that will affect the sustainability of tidal marshes as sea level rises.
Add underlined language as follows: k. <u>Landward marsh migration may be necessary to sustain marsh acreage around the Bay as sea level rises. As sea level rises, high-energy waves erode inorganic mud from tidal flats and deposit that sediment onto adjacent tidal marshes. Marshes trap sediment and contribute additional material to the marsh plain as decaying plant matter accumulates. Tidal habitats respond to sea level rise by moving landward, a process referred to as transgression or migration. Low sedimentation rates, natural topography, development, and shoreline protection can block wetland migration.</u>	The new finding describes the process of marsh migration—essential to sustain marshes as sea level rises—and further elaborates on the roles of plants and sediment in that process and potential impediments to it.

Tidal Marshes and Tidal Flats	
Findings	**Staff Analysis**
Add underlined language and delete struck-through language as follows: ~~k~~ l. Sedimentation is an essential factor in the creation, maintenance and growth of tidal marsh and tidal flat habitat. ~~However,~~ Scientists studying the Bay ~~estimate~~ observed that ~~sedimentation will not be able to keep pace with accelerating sea level rise, due largely to declines in~~ the volume of sediment entering the Bay annually from the Sacramento and San Joaquin Delta is declining. As a result, the importance of sediment from local watersheds as a source of sedimentation in tidal marshes is increasing. As sea level rise accelerates, the erosion of tidal flats may also accelerate, thus potentially exacerbating shoreline erosion and adversely affecting the ecosystem and the sustainability of ~~future wetland~~ ecosystem restoration projects. An adequate supply of sediment is necessary to ensure resilience of the Bay ecosystem as sea level rise accelerates.	The finding has been updated to reflect the most current information on sediment supply and how the supply has been altered and how reduced sediment will impact these habitats in combination with climate change. The finding was re-lettered from k. to l.
Add underlined language as follows: m. Human actions, such as dredging, disposal, ecosystem restoration, and watershed management, can affect the distribution and amount of sediment available to sustain and restore wetlands. Research on Bay sediment transport processes is needed to understand the volume of sediment available to wetlands, including sediment imported to and exported from the Bay. Monitoring of these processes can inform management efforts to maintain an adequate supply of sediment for wetlands.	The new finding describes information that is needed to understand sediment transport and volumes in the Bay so that efforts can be made to effectively manage sediment supply.
Add underlined language and delete struck-through language as follows: n. Buffers are areas established adjacent to a habitat to reduce the adverse impacts of surrounding land use and activities. Buffers also minimize additional loss of habitat from shoreline erosion resulting from accelerated sea level rise and allow tidal habitats to move landward. Buffer areas may be critical for achieving the regional goals for the types, amounts, and distribution of habitats in the Baylands Ecosystem Habitat Goals report or future updates to these targets.	The new finding defines buffer areas, describes their current benefits, and highlights the need for them as space where marshes can migrate as sea level rises.

Tidal Marshes and Tidal Flats	
Findings	**Staff Analysis**
~~l.~~ o.Plant and animal species not present in San Francisco Bay prior to European contact in the late 18th century, known as non-native species, which thrive and reproduce outside of their natural range have made vast ecological alterations to the Bay and have contributed to the serious reduction of native regulations of certain plants and animals through: (1) predation; (2) competition for food, habitat, and other necessities; (3) disturbance of habitat; (4) displacement; or (5) hybridization. Many non-native species enter the Bay from commercial ship ballast water that is discharged into the Bay. Approximately 170 species have invaded the Bay since 1850, and possibly an additional 115 species have been deliberately introduced. By 2001, over 1,200 acres of recently restored tidal marshes have been invaded by introduced cordgrass species, such as salt meadow cordgrass, dense-flowered cordgrass, English cordgrass and smooth cordgrass. At present an average of one new non-native species establishes itself in the Bay every 14 weeks. Control or eradication is a critical step in reducing the harm associated with non-native species.	The finding was re-lettered from l. to o.
~~m.~~p.Fill material, such as rock and sediments 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.	The finding was re-lettered from m. to p.
Policies 1 through 3—no changes	
Add underlined language and delete ~~struck through language~~ as follows: 4. Where ~~and whenever possible~~ feasible, former tidal marshes and tidal flats that have been diked from the Bay should be restored to tidal action in order to replace lost historic wetlands or should be managed to provide important Bay habitat functions, such as resting, foraging and breeding habitat for fish, other aquatic organisms and wildlife. As recommended in the Baylands Ecosystem Habitat Goals report, around 65,000 acres of areas diked from the Bay should be	The policy has been modified to recommend periodic updates to the Habitat Goals report so that it reflects the effects of climate change on wetlands. Also the purpose of purchasing land to facilitate wetland migration was also added. Deleted "from willing sellers" because it conflicts with the power of eminent domain held by many jurisdictions that overlap with the Commission's jurisdiction.

Tidal Marshes and Tidal Flats	
Policies	**Staff Analysis**
restored to tidal action to maintain a healthy Bay ecosystem on a regional scale. Regional ecosystem targets should be updated periodically to guide conservation, restoration, and management efforts that result in a Bay ecosystem resilient to climate change and sea level rise. Further, local government land use and tax policies should not lead to the conversion of these restorable lands to uses that would preclude or deter potential restoration. The public should make every effort to acquire these lands ~~from willing sellers~~ for the purpose of habitat restoration and wetland migration.	
Add underlined language and delete struck-through language as follows: 5. The Commission should support comprehensive Bay sediment research and monitoring to understand sediment processes necessary to sustain and restore wetlands. Monitoring methods should be updated periodically based on current scientific information.	The new policy recommends supporting sediment research and monitoring that can inform future management decisions on projects in the Bay, particularly wetland restoration projects.
Add underlined language and delete struck-through language as follows: ~~5~~ 6. Any ecosystem ~~tidal~~ restoration project should include clear and specific long-term and short-term biological and physical goals, and success criteria, and a monitoring program to assess the sustainability of the project. Design and evaluation of the project should include an analysis of: (a) ~~the effects of relative~~ how the system's adaptive capacity can be enhanced so that it is resilient to sea level rise and climate change; (b) the impact of the project on the Bay's sediment budget; (c) localized sediment erosion and accretion; (d) the role of tidal flows; (e) potential invasive species introduction, spread, and their control; (f) rates of colonization by vegetation; (g) the expected use of the site by fish, other aquatic organisms and wildlife; (h) an appropriate buffer, where feasible, between shoreline development and habitats to protect wildlife and provide space for marsh migration as sea level rises; and (j) site characterization. If success criteria are not met, appropriate ~~corrective~~ adaptive measures should be taken.	The policy has been updated to add and revise criteria restoration project by focusing on restoring resilient ecosystems, and to include new analysis of the potential for buffer areas for marsh migration where feasible. The policy was re-numbered from 5 to 6.

Climate Change. The staff preliminarily recommends the Commission add a new Bay Plan "Climate Change" policy section at the beginning of Part IV of the Plan - Developing the Bay and its Shoreline - and include the proposed findings and policies below.

Revised Climate Change Section

Climate Change	
Findings	**Staff Analysis**
Add underlined language as follows: a. Greenhouse gases naturally reside in the earth's atmosphere, absorb heat emitted from the earth's surface and radiate heat back to the surface causing the planet to warm. This natural process is called the "greenhouse effect." Human activities since industrialization have increased the emissions of greenhouse gases through the burning of fossil fuels. The accumulation of these gases in the atmosphere is causing the planet to warm at an accelerated rate.	The new finding describes the causes of climate change.
Add underlined language as follows: b. The future extent of global warming is uncertain. It will be driven largely by future greenhouse gas emissions levels, which will depend on how global development proceeds. The United Nations Intergovernmental Panel on Climate Change (IPCC) developed a series of global development scenarios and greenhouse gas emissions scenarios for each development scenario. These emissions scenarios have been used in global models to develop projections of future climate, including global surface temperature and precipitation changes.	The new finding describes how United Nations scenarios are used to address uncertainty regarding future global development and the corresponding impacts of development on climate change.
Add underlined language as follows: c. Global surface temperature increases are accelerating the rate of sea level rise worldwide through thermal expansion of ocean waters and melting of land-based ice (e.g., ice sheets and glaciers). Bay water level is likely to rise by a corresponding amount. In the last century, sea level in the Bay rose nearly eight inches. Current science-based projections of global sea level rise over the next century vary widely. As new information on climate change becomes available and factors that have regional effects on sea level rise, such as the Pacific Decadal Oscillation are better understood, future sea level rise projections are likely to change. Using IPCC greenhouse gas emissions scenarios, the California Climate Action Team developed sea level rise projections (relative to sea level in 2000) for the state that range from 11 to 18 inches at mid-century and 23 to 55 inches at the end of century. Although these are currently the best science-based sea level rise projections for the West Coast, recent observations of global greenhouse	The new finding explains the connection between global warming and sea level rise. It describes the Commission's responsibility to use a prudent approach to protect the public from flooding and to protect the Bay ecosystem from climate change impacts. This finding also explains the sound science that supports such an approach. The finding also acknowledges regional factors affecting sea level rise and, references the California Climate Action Team's projections for California (a mid-century range (11-18 inches) and a end-of-century range (20-55 inches) as a guide for implementing the policies.

Climate Change	
Findings	**Staff Analysis**
gas emissions show higher trajectories than the IPCC's most intensive emissions scenario. Moreover, melting of the Greenland and Antarctic ice sheets is not currently well reflected in sea level rise projections. Sea level rise projections will change over time. ~~Therefore, to minimize flood risk~~ For purposes of analysis of future flood risk, it is prudent to rely on ~~higher projections in the~~ a range of possible future sea level rise scenarios based on the best available science at the time of the analysis.	
Add underlined language as follows: d. Climate change will alter key factors that contribute to shoreline flooding, including sea level and storm frequency and intensity. During a storm, low air pressure can cause storm surge (a rapid rise in water level) and increased wind and wave activity can cause wave run up, which will be higher as sea level rises. These storm events can be exacerbated by El Niño events, which generally result in persistent low air pressure, greater rainfall, high winds and higher sea level. The coincidence of intense winter storms, extreme high tides, and high runoff, in combination with higher sea level, will increase the frequency and duration of shoreline flooding long before areas are permanently inundated by sea level rise alone.	The new finding makes the point that most flooding will occur during storm events before sea level rise regularly inundates shoreline areas. The finding describes how sea level rise and storm activity combine to cause flooding.

Add underlined language as follows: e. Shoreline areas currently vulnerable to a 100-year flood event may be subjected to inundation by high tides at mid-century. Much of the developed shoreline may require new or upgraded shoreline protection to reduce damage from flooding. Shoreline areas that have subsided are especially vulnerable to sea level rise and may require more extensive shoreline protection. The Commission, along with other agencies such as the National Oceanic and Atmospheric Agency, the Federal Emergency Management Agency and the United States Army Corps of Engineers, is responsible for protecting the public and the Bay ecosystem from flood hazards. This can be best achieved by using a range of scientifically based ~~higher emissions~~ scenarios, including projections which correspond to higher rates of sea level rise. In planning and designing projects for the Bay shoreline, it is prudent to rely on the most current science-based and regionally specific projections of future sea level rise, develop strategies and policies that can accommodate sea level rise over a specific planning horizon (i.e., adaptive management strategies), and preclude new development that cannot be adapted to sea level rise.	The new finding describes the potential for shoreline flooding as sea level rises and the likely need for new shoreline protection to address it, particularly in subsided areas. It recommends using the most current, science-based, regionally specific projections of future sea level rise.

Climate Change	
Findings	**Staff Analysis**
Add underlined language as follows: f. Natural systems and human communities are considered to be resilient when they can absorb and rebound from the impacts of weather extremes or climate change and continue functioning without substantial outside assistance. Systems that are currently under stress often have lower adaptive capacity and may be more vulnerable or susceptible to harm from climate change impacts. Human communities with adaptive capacity can adjust to climate change impacts by taking actions to reduce the potential damages, taking advantage of new opportunities arising from climate change, and accommodating the impacts. Understanding vulnerabilities to climate change is essential for assessing climate change risks to a project, the Bay or the shoreline. Risk is a function of the likelihood of an impact occurring and the consequence of that impact. Climate change risk assessments identify and prioritize issues that can be addressed by adaptation strategies.	The new finding defines two important concepts in climate adaptation planning: shoreline resilience and adaptive capacity. It also defines the related practices of vulnerability and risk assessment and describes the outcomes of these practices.
Add underlined language as follows: g. In the context of climate change, mitigation refers to actions taken to reduce greenhouse gas emissions, and adaptation refers to actions taken to address potential or experienced impacts of climate change that reduce risks. Adaptation actions can include relocating structures out of flood and inundation zones, protecting shorelines, and designing new construction to be resilient to sea level rise. Some actions can integrate adaptation and mitigation strategies, such as restoring tidal marshes that both sequester carbon and provide flood protection. Adaptation and mitigation measures that are implemented before sea level rises may be cost effective and may protect lives, property and ecosystems.	The new finding defines mitigation as it is commonly used to address climate change. The finding also defines adaptation, points out that mitigation and adaptation efforts can be integrated, and describes the benefits of implementing some adaptation strategies early.

Add underlined language as follows: h. In the context of sea level rise adaptation, innovative approaches will likely include financing mechanisms, design concepts and land management practices. Effective, innovative adaptation approaches minimize public safety risks; maximize compatibility with and integration of natural processes; are resilient over a range of sea level, potential flooding impacts and storm intensities; and are adaptively managed. Developing innovative adaptation approaches will require financial resources, testing and refinement to ensure that they effectively protect the Bay ecosystem and public safety before they are implemented on a large scale.	The new finding describes the range of likely innovative adaptation approaches and sets criteria for what would constitute an effective innovative strategy. It outlines some of the challenges for developing innovative strategies

Climate Change	
Findings	**Staff Analysis**
Add underlined language as follows: i. Adaptive management is a cyclic, learning-oriented approach that is especially useful for complex environmental systems characterized by high levels of uncertainty about system processes and the potential for different ecological, social and economic impacts from alternative management options. Effective adaptive management requires setting clear and measurable objectives, collecting data, reviewing current scientific observations, monitoring the results of policy implementation or management actions, and integrating this information into future actions.	The new finding defines adaptive management, as it is commonly understood in managing human interventions in complex systems. It also describes how effective adaptive management is implemented.
Add underlined language as follows: j. The principle of sustainability embodies values of equity, environmental and public health protection, economic vitality and safety. The goal of sustainability is to conduct human endeavors in a manner that will avoid depleting natural resources for future generations and producing no more than can be assimilated through natural processes. Efforts to improve the sustainability of natural systems and human communities can improve their resilience to climate change by increasing their adaptive capacity.	The new finding defines sustainability in the context of climate change, resilience and adaptive capacity.
Add underlined language as follows: k. Shoreline development and infrastructure, critical to public and environmental health and the region's economic prosperity, are potentially vulnerable to flooding from sea level rise and storm activity. Public safety may be compromised and personal property may be damaged or lost during floods. Important public shoreline infrastructure and facilities, such as airports, ports, regional transportation facilities, landfills, contaminated lands and wastewater treatment facilities are at risk of flood damage that could require costly repairs, result in the interruption or loss of vital services or degraded water quality. A lack of funding to address projected impacts from sea level rise will limit the Bay Area's ability to meet environmental, public health, equity and economic goals.	The new finding describes the impacts of flooding on the developed shoreline. It also acknowledges funding limitations for adaptation planning and implementation, and the potential impacts of inaction.

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Add underlined language as follows: l. Waterfront parks, beaches, public access sites, and the Bay Trail are particularly vulnerable to flooding from sea level rise and storm activity because they are located immediately adjacent to the Bay. Flooding of, or damage to these areas would adversely affect the region's quality of life, if important public spaces and recreational opportunities are lost.	The new finding describes the impacts of flooding on shoreline recreation areas and trails.
Add underlined language as follows: m. The Bay ecosystem contains diverse and unique plants and animals and provides many benefits to humans. For example, tidal wetlands provide critical flood protection, improve water quality, and sequester carbon. Tidal high marsh and adjacent ecotones are essential to many tidal marsh species, including endangered species. The Bay ecosystem is already stressed by human activities that lower its adaptive capacity, such as diversion of freshwater inflow and loss of tidal wetlands. Climate change will further alter the ecosystem by inundating or eroding wetlands and ecotones, changing sediment dynamics, altering species composition, raising the acidity of Bay waters, changing freshwater inflow or salinity, altering the food web, and impairing water quality, all of which may overwhelm the system's ability to rebound and continue functioning. Moreover, further loss of tidal wetlands will increase the risk of shoreline flooding.	The new finding describes the importance of the Bay ecosystem and some of the benefits humans derive from the Bay and the impacts of climate change on the Bay ecosystem. *The finding was re-lettered from j. to k. The word demand was changed to dynamics for clarity*
Add underlined language as follows: n. Some Bay Area residents, particularly those with low incomes or disabilities and the elderly, may lack the resources or capacity to respond effectively to the impacts of sea level rise and storm activity. Financial and other assistance is needed to achieve regional equity goals and help everyone be part of resilient shoreline communities.	The new finding describes the particular vulnerabilities of residential communities to flooding, especially low-income residents, the elderly and those with disabilities.

Add underlined language as follows: o. Approaches for ensuring public safety in developed vulnerable shoreline areas through adaptive management strategies include but are not limited to: (1) protecting existing and planned infill development; (2) accommodating flooding by building structures ~~that~~ or infrastructure systems that are resilient or adaptable over time; (3) discouraging permanent new development when adaptive management strategies cannot protect public safety; (4) allowing only ~~interim~~ new uses that can be removed or phased out if adaptive management strategies are not available as inundation threats increase; and (5) over time and where feasible, removing existing development where public safety cannot otherwise be ensured.	The new finding describes the range of potential human development responses to sea level rise.

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Add underlined language as follows: p. ~~Infill development is the economic use of underutilized or vacant land, or the rehabilitation of existing structures or infrastructure located in an area where supporting infrastructure is in place and that is surrounded by existing development that either is or will be served by transit. Infill development has been identified as an important strategy for reducing greenhouse gas emissions in the Bay Area by providing jobs and housing in locations and at densities that can be served by transit.~~ Infill development is building homes, businesses, institutions and/or public uses, facilities and infrastructure on vacant, underutilized and/or environmentally degraded lands within existing urbanized areas that are served by existing or planned transit and other supporting infrastructure. Infill development includes the conversion of former military bases, and property adjacent to former military bases, to job-producing or other productive uses, and the adaptive reuse of existing structures. Some vulnerable Bay shoreline areas are already improved with development that has regionally significant economic, cultural or social value, and can accommodate infill development.	The new finding defines infill development in the context of Bay Area shoreline development that considers sea level rise.
Add underlined language as follows: q. Infill development has been identified in state law as an important strategy for reducing vehicle miles traveled and greenhouse gas emissions. To further these policy objectives, the Association of Bay Area Governments and the Metropolitan Transportation Commission initiated the FOCUS program to develop a regional development strategy that promotes a more compact Bay Area land use pattern. In consultation with local governments and the Commission, the FOCUS program identified Priority Development Areas for infill development in the Bay Area.	This new finding articulates the value of infill development to the region, and the designation of PDAs as regionally significant infill locations.

Add underlined language as follows: ~~q~~r. When planning or regulating development within areas vulnerable to flooding from sea level rise, allowing small projects, such as ~~minor~~ repairs of existing facilities, and interim uses ~~may be acceptable~~ should be subject to a simpler and more streamlined review and approval process if they do not significantly increase overall risks to public safety.	The new finding acknowledges the need to provide a different approach to regulating ~~minor~~ repairs, small projects or interim uses that do not increase public safety risks.
Add underlined language as follows: ~~r~~s. In some cases, the regional goals of encouraging infill development, remediating environmentally degraded land, redeveloping closed military bases and concentrating housing and job density near transit may conflict with the goal of minimizing flood risk by avoiding development in low-lying areas vulnerable to flooding. To minimize this conflict, local agencies may employ methods including but not limited to: clustering infill or redevelopment in low-lying areas ~~can be clustered~~ on a portion of the property to reduce the area that must be protected; formulating an adaptation strategy for dealing with rising sea level and shoreline flooding ~~can be formulated~~ with definitive goals and an adaptive management plan for addressing key uncertainties for the life of the project; and incorporating measures ~~can be incorporated~~ that will enhance project ~~achieve~~ resilience and sustainability ~~in all elements of the project; and~~. Government agencies that approve infill or redevelopment projects in low-lying areas should articulate a financing strategy for future flood protection. a ~~permanent~~ financial strategy ~~can be developed to guarantee that the general public will not be burdened with the cost of protecting the project from any sea level rise or storm damage caused by sea level rise in the future~~ .	The new finding outlines some of the potentially conflicting regional goals and potential safety risks from developing in low-lying areas. It outlines possible methods for minimizing risks and avoiding unfair distribution of costs associated with those risks.

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Add underlined language as follows: ~~s~~t. Some undeveloped low-lying areas that are vulnerable to shoreline flooding contain critical habitat or provide opportunities for habitat enhancement. Allowing development in these areas ~~would preclude important~~ could potentially conflict with habitat enhancement opportunities. Some developed areas may be suitable for ecosystem restoration if existing development is removed to allow the Bay migrate inland, although relocating communities is very costly and may result in the displacement of neighborhoods.	The new finding acknowledges some undeveloped areas contain critical habitat or could be enhanced for habitat, and some developed areas may be ideal for bay migration and habitat enhancement as sea level rises. It also acknowledges that relocating development raises difficult public policy issues and costs.
Add underlined language as follows: ~~t~~u. There are multiple local, state, federal, and regional government agencies with authority over the Bay and shoreline. Local governments have broad authority over shoreline land use, but limited resources to address climate change adaptation. Working collaboratively can optimize scarce resources and create the flexibility needed to plan amidst a high degree of uncertainty.	The new finding describes the patchwork of government authority over the Bay and shoreline. It further describes the broad authority and limited capacity of local governments to address climate change and benefits of collaboration.
Add underlined language as follows: ~~u~~v. Government jurisdictional boundaries and authorities in the Bay Area are incongruent with the regional scale and nature of climate-related challenges. The Joint Policy Committee, which is comprised of regional agencies, provides a framework for regional decision-making to address climate change through consistent and effective regionwide policy and to provide local governments with assistance and incentives for addressing climate change. The Commission is working with other regional agencies to (1) harmonize Bay Plan Climate Change Policies with the Association of Bay Area Governments (ABAG) Priority Development Areas and update Bay Plan policies if necessary to ensure that appropriate infill development projects are encouraged, and (2) support the Metropolitan Transportation Commission (MTC) and other state, regional and local agencies in the creation of sustainable community strategies required by SB 375.	The new finding describes the need to provide a decision-making framework that resembles the scale of climate change impacts within a manageable scope. It also acknowledges the role the Joint Policy Committee can play in planning for climate change at the regional level.

Add underlined language as follows: ~~v~~w. The Commission's current legal authority and regulatory jurisdiction, which were created to allow the Commission to advance the State goals of preventing unnecessary filling of the Bay and increasing public access to the Bay shoreline, limit the Commission's ability to successfully conserve the Bay and guide the wise development of the Bay and its shoreline in the face of current and future rates of sea level rise. Consistent with McAteer Petris Act Section 66610, the Commission's Bay Plan policies only have force of law in the Commission's jurisdiction. Bay Plan policies do not expand the Commission's jurisdiction. However, through its Bay Plan policies the Commission can provide guidance to developers, the general public, local governments, and other governmental agencies that have broader authority over the use and development of areas that are vulnerable to inundation. Local building officials have the primary responsibility for determining the safety of flood mitigation strategies as applied to structures constructed in an inundation or flood risk zone. Local floodplain management administrators are responsible for analyzing future floodplain risks associated with sea level rise and addressing these risks in local floodplain management ordinances.	The new finding was added to staff's preliminary recommendation to acknowledge that the challenges climate change presents to San Francisco Bay, and shoreline development cannot be successfully met by relying solely on the Commission's existing regulatory authority. It also acknowledges that the Commission can provide important guidance for development in low-lying areas outside of its jurisdiction. It also clarifies that the Bay Plan does not expand the Commission's jurisdiction.
Add underlined language as follows: x. Existing guidelines under the California Environmental Quality Act provide for analysis of whether a project in an inundation zone will expose people or structures to a significant risk of loss, injury or death involving flooding.	
Add underlined language as follows: y. Projects or activities that may be undertaken in the future within the scope of an existing permit for a phased development are governed exclusively by the terms of the existing permit, and are not subject to any Bay Plan policies adopted subsequent to the approval of the permit.	

Add underlined language as follows: z. With rare exceptions, projects and other activities in areas potentially subject to future inundation but outside of the Commission's permit jurisdiction do not affect areas within the Commission's permit jurisdiction, and therefore they will not be subject to the consistency requirements of the federal Coastal Zone Management Act of 1972.	This new finding clarifies that, as a factual matter, there will be very few projects outside the Commission's jurisdiction in areas subject to potential inundation which would actually affect areas within BCDC jurisdiction. Projects outside BCDC jurisdiction that do not affect areas within BCDC jurisdiction are not subject to the consistency requirements of the federal Coastal Zone Management Act of 1972 or under the Commission's coastal zone management program for the BCDC segment of the California coastal zone.

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~~**Findings**~~ **Policies**	**Staff Analysis**
Add underlined language as follows: 1. When planning shoreline areas or designing larger shoreline projects, local agencies should undertake a risk assessment and may ~~should be~~ prepared~~,~~ coastal inundation maps based on the estimated 100-year flood elevations that take the best available scientific estimates of future sea level rise and current or planned flood protection into account. A range of sea level rise projections for mid-century and end of century, ~~including at least one high estimate that is~~ based on the best ~~science-based projections currently~~ scientific data available, should be used in the risk assessment. Inundation maps should be prepared under the direction of a coastal engineer.	The new policy requires assessment of sea level rise and flood risks in shoreline area planning and project design for permit applications submitted to BCDC.
Add underlined language as follows: 2. To protect public safety and ecosystem services, within areas vulnerable to future shoreline flooding, all projects—other than ~~minor~~ repairs of existing facilities, small projects that do not increase risks to public safety, interim projects, and infill projects as defined in findings (p) and (q)—should be designed to be resilient to a mid-century sea level rise projection based upon a risk assessment conducted for the project by a qualified engineer. If it is likely the project will remain in place longer than mid-century, an adaptive management plan should be developed to address the long term impacts that will arise based on a risk assessment using the best available science-based projection for sea level rise at the end of the century.	The new policy requires certain developments to be designed to be resilient to sea level rise based on a mid-century sea level rise protection and for developments of longer duration to also develop an adaptive management plan for addressing ongoing sea level rise, based on a sea level rise projection.
Add underlined language as follows: 3. Undeveloped, vulnerable shoreline areas that currently sustain diverse habitats and species or possess conditions that make the areas especially suitable for ecosystem enhancement should be preserved, enhanced or permanently protected to allow for the inland migration of Bay habitat as sea level rises and to address the adverse environmental impacts of climate change, unless inland migration would be inconsistent with applicable priority use designations, or with an approved environmental remediation remedy prepared in compliance with applicable federal or state laws.	The new policy provides that low-lying areas with diverse habitat values or those that are suitable for natural resource enhancement should be protected or enhanced, and where appropriate, permanently protected for these purposes.
Add underlined language as follows: 4. Wherever feasible and appropriate, effective, innovative sea level rise adaptation approaches should be encouraged.	The new policy encourages the development and implementation of innovative sea level rise adaptation strategies.

Climate Change	
Policies	**Staff Analysis**
Add underlined language as follows: 5. The Commission, in collaboration with the Joint Policy Committee, other regional, state and federal agencies, local governments, and the general public, should formulate a regional sea level rise adaptation strategy for protecting critical developed shoreline areas, and natural ecosystems, enhancing the resilience of Bay and shoreline systems and increasing their adaptive capacity. The strategy should incorporate an adaptive management approach, be consistent with sustainable communities strategies required by SB 375, be updated regularly to reflect changing conditions and information, and include maps of shoreline areas that are vulnerable to flooding based on projections of future sea level rise and shoreline flooding. The maps should be prepared under the direction of a coastal engineer and should be regularly updated in consultation with government agencies with authority over flood protection. Particular attention should be given to identifying and encouraging the development of long-term regional flood protection strategies that may be beyond the fiscal resources of individual local governments. The regional strategy should determine where and how existing development should be protected and infill development encouraged, where new development should be permitted, and where existing development should eventually be removed to allow the Bay to migrate inland.	The new policy recommends that the region develop and regularly update a regional strategy to adapt to the Bay-related impacts of climate change. The policy suggests a framework is needed to organize multiple jurisdictions and allow for the type of adaptive management planning that is necessary when working with a high degree of uncertainty, complex, interconnected systems, limited resources, and the ongoing release of new scientific information. The framework should also be consistent with sustainable communities strategies required by SB 375.

The goals of the strategy should be to: a. advance regional public safety and economic prosperity by protecting most existing and planned shoreline development, especially development that provides regionally significant benefits and by protecting infrastructure that is critical to public health or the region's economy, such as airports, ports, regional transportation, wastewater treatment facilities, major parks, recreational areas and trails;	The new policy acknowledges the need to identify areas where existing development should be protected, those areas where development should eventually be removed and those areas where the Bay should be allowed to migrate inland; it includes sustainability as a criteria;
b. enhance the Bay ecosystem (e.g., Bay habitats, fish, wildlife and other aquatic organisms) by identifying both developed and undeveloped areas where tidal wetlands and tidal flats can migrate landward; assuring adequate volumes of sediment for marsh accretion; identifying priority conservation areas that should be considered for acquisition, preservation or enhancement; developing and planning for flood protection; and maintaining sufficient transitional habitat and upland buffer areas around tidal wetlands;	

Climate Change	
Policies	**Staff Analysis**
c. integrate the protection of existing and future shoreline development with the enhancement of the Bay ecosystem, such as by using feasible shoreline protection measures that incorporate natural Bay habitat for flood control and erosion prevention; d. encourage innovative approaches to sea level rise adaptation; e. identify a framework for integrating the adaptation responses of multiple government agencies; f. integrate regional mitigation measures designed to reduce greenhouse gas emissions with regional adaptation measures designed to address the unavoidable impacts of climate change; g. advance regional sustainability, encourage infill development and job creation, and provide diverse housing served by transit; h. address any existing contamination and the implications of the contamination on water quality; i. support research that provides information useful for planning and policy development on the impacts of climate change on the Bay, particularly those related to shoreline flooding; j. identify actions to prepare and implement the strategy, including any needed changes in law; and k. identify mechanisms to provide information, tools, and financial resources so local governments can integrate regional climate change adaptation planning into local community design processes.	
Add underlined language as follows: 6. Subject to findings (x) and (y) above, until a regional sea level rise adaptation strategy can be completed and local adaptive management standards are developed, local governments, together with the Commission in its jurisdiction, should evaluate new development projects in areas vulnerable to future shoreline flooding on a case-by-case basis. Projects that should proceed are: ~~not be limited to:~~ a. ~~minor~~ repairs to~~of~~ existing facilities or small projects that ~~do~~will not increase risks to public safety; b. transportation facilities, public utilities or other critical infrastructure that is necessary for the continued viability of existing development;	The new policy describes an interim approach to authorizing development in low-lying areas, both within and outside of the Commission's jurisdiction. It requires and recommends that development in low-lying areas be limited to infill, natural resource restoration or enhancement, development providing significant regional benefits, ineterim or temporary uses, redevelopment that meets certain criteria, development outside of low-lying areas, or projects in low lying areas that will not require future bay fill for shoreline protection to address future sea level rise.

Climate Change	
Policies	**Staff Analysis**
~~c. infill development within existing urbanized areas that contain development and infrastructure of such high value that the areas will likely be protected whether or not the infill takes place;~~ ~~d. redevelopment that will remediate existing environmental degradation or contamination, particularly on closed military bases, if the redevelopment will~~ c. development within planned and potential ABAG Priority Development Areas; d. infill development as defined in findings (p) and (q) that is located in an area that will likely be protected whether or not the development takes place; e. other development or redevelopment that ~~(1)~~ provides significant regional benefits and meets regional goals ~~by concentrating employment or housing near adequate transit service sufficient to serve the project, and~~ and that includes the following elements: (1) an adaptation strategy for dealing with rising sea level and shoreline flooding with definitive goals and an adaptive management plan for addressing key uncertainties for the life of the project; (2) measures that will ~~achieve~~ enhance project resilience and sustainability ~~in all elements of the project;~~ (3); a ~~permanent~~ financial strategy that addresses the potential ~~will guarantee the general public will not be burdened with the~~ cost of protecting the project from ~~any sea level rise or~~ storm damage due to sea level rise in the future; ~~or;~~ ~~e~~f. projects or uses that are interim or temporary in nature where the use or structures: (1) can be easily removed or relocated to higher ground; (2) can be amortized within a period before removal or relocation of the proposed use is required; and (3) will not require additional shoreline protection during the life of the project beyond those flood mitigation strategies that are proposed as part of the project; and ~~.~~ ~~f~~e. public parks, natural resource restoration or environmental enhancement projects~~.~~	

7. To effectively address sea level rise and flooding, if more than one government agency has authority or jurisdiction over a particular issue or area, project reviews should be coordinated to resolve conflicting guidelines, standards or conditions.	The new policy advocates for good government and coordination in project reviews when jurisdictions overlap.
Add underlined language as follows: 8. In any area potentially subject to future inundation but outside of the Commission's jurisdiction, a project that is or may be inconsistent with any Bay Plan climate change policy should not be deemed by any lead or responsible agency as inconsistent with the Bay Plan for purposes of environmental review under CEQA; nor will the Commission subject that project to consistency review under the federal Coastal Zone Management Act except in those rare cases where the project will clearly affect areas within the Commission's jurisdiction.	The new policy clarifies that the Commission does not intend that the Climate Change policies should be used by lead and responsible agencies as the basis for Bay Plan inconsistency findings under CEQA. It also clarifies that the policies will not be used the Commission for consistency determinations or certifications under the Coastal Zone Management Act in potential inundation areas except in those rare situations where the project clearly affects areas within BCDC's jurisdiction.

Safety of Fills. The staff preliminarily recommends the Commission revise the findings and policies in the *Safety of Fills* policy section as shown below.

More context on how other findings and policies in this section of the Bay Plan relate to the proposed changes, especially those that the staff is not proposing to change, is available at http://www.bcdc.ca.gov/laws_plans/plans/sfbay_plan.shtml

Safety of Fills	
Findings	**Staff Analysis**
Add underlined language and delete struck-through language as follows: f. Flood damage to fills and shoreline areas can result from a combination of sea level rise, storm surge, ~~heavy~~ rainfall, high tides, and winds blowing onshore. The most effective way ~~T~~to prevent such damage, is to locate projects and facilities ~~structures~~ on fill or near the shoreline ~~should be~~ above ~~the~~ a ~~highest expected water level~~ 100-year flood level that takes future sea level rise into account, during the expected life of the project. ~~or should be protected for the expected life of the project by~~ Other approaches that can reduce flood damage include protecting structures or areas with levees, ~~of an adequate height~~ seawalls, tidal marshes, or other protective measures, employing innovative design concepts, such as building structures that can be easily relocated, tolerate periodic flooding, float, or are adaptively designed and managed to address sea level rise over time.	The finding was updated to be consistent with language in the proposed Climate Change section of the Bay Plan and to include new ideas for shoreline development that might accommodate rising waters levels.
Add underlined language and delete struck-through language as follows: g. ~~Bay water levels are likely to increase in the future because of a relative rise in sea level. Relative rise in sea level is the sum of: (1) a rise in global sea level and (2) land elevation change (lifting or subsidence) around the Bay. If historic trends continue, global sea level should increase between four and five inches in the Bay in the next 50 years and could increase approximately one and one half to five feet by the year 2100 depending on the rate of accelerated rise in sea level caused by the "greenhouse effect," the long-term warming of the earth's surface from heat radiated off the earth and trapped in the earth's atmosphere by gases released into the atmosphere. The warming would bring about an accelerated rise in sea level worldwide through thermal expansion of the upper layers of the oceans and melting of some of the earth's glaciers and polar ice packs.~~ Sea level is rising at an accelerated rate due to global climate change. Land elevation change caused by tectonic (geologic, including seismic) activity, consolidation or compaction of soft soils such as Bay muds, and extraction of subsurface groundwater or natural gas extraction, is variable around the Bay. Consequently, some parts of the Bay will experience a greater	The finding has been revised to update and relocate substantial portions of text regarding climate change and sea level rise to the proposed Climate Change section of the Bay Plan and to reconcile these two findings and policy sections.

Safety of Fills	
Findings	**Staff Analysis**
relative rise in sea level than other areas. Relative rise in sea level is the sum of: (1) a rise in global sea level and (2) land elevation change (lifting or subsidence) around the Bay. ~~For example, in Sausalito, the land area has been gradually lifting while in the South Bay excessive pumping from underground fresh water reservoirs has caused extensive subsidence of the ground surface in the San Jose area and as far north as Dumbarton Bridge (map of Generalized Subsidence and Fault Zones shows subsidence from 1934 to 1967). Indications are that if heavy groundwater pumping is continued indefinitely in the South Bay area, land in the Alviso area (which has already subsided about seven feet since 1912) could subside up to seven feet more; if this~~ Where subsidence occurs, more extensive ~~levees~~ shoreline protection and wetland restoration projects may be needed to minimize ~~prevent inundation~~ flooding of low-lying areas by the extreme high water level.	
Policies	**Staff Analysis**
Add underlined language and delete struck-through language as follows: 3. To provide vitally-needed information on the effects of earthquakes on all kinds of soils, installation of strong-motion seismographs should be required on all future major land fills. In addition, the Commission encourages installation of strong-motion seismographs in other developments on problem soils, and in other areas recommended by the U.S. ~~Coast and Geodetic~~ Geological Survey, for purposes of data comparison and evaluation.	The policy has been updated to include the correct name of the U.S. Geological Survey.
Add underlined language and delete struck-through language as follows: 4. Adequate measures should be provided ~~T~~to prevent damage from sea level rise and storm activity ~~flooding,~~ that may occur ~~structures~~ on fill or near the shoreline over the expected life of a project. ~~should have adequate flood protection including consideration of future relative sea level rise as determined by competent engineers. As a general rule,~~ The Commission may approve fill that is needed to provide flood protection for existing	Structures on fill or near the shoreline should be above the wave runup level or sufficiently set back from the edge of the shore so that the structure is not subject to dynamic wave energy. In all cases, the bottom floor level of structures should be above the highest estimated tide elevation. Exceptions to the general height rule may be made for developments specifically designed to tolerate periodic flooding.

Safety of Fills	
Policies	**Staff Analysis**
projects. Except for priority use areas, ~~N~~new projects ~~structures~~ on fill or near the shoreline should either be ~~above the wave runup level or sufficiently~~ set back from the edge of the shore so that the project ~~structure is~~ will not be subject to dynamic wave energy~~.~~, be built so ~~In all cases,~~ the bottom floor level of structures ~~should~~ will be above a ~~the highest estimated tide~~ 100-year flood elevation that takes future sea level rise into account for the expected life of the project~~.~~, be ~~Exceptions to the general height rule may be made for developments~~ specifically designed to tolerate periodic flooding, or employ other effective means of addressing the impacts of future sea level rise and storm activity. Within priority use areas, new projects on fill that cannot meet these design criteria may propose alternative measures to address future sea level rise and storm activity, including but not limited to other engineered solutions such as levees or seawalls. Rights-of-way for levees or other structures protecting inland areas from tidal flooding should be sufficiently wide on the upland side to allow for future levee widening to support additional levee height so that no fill for levee widening is placed in the Bay.	The policy has been updated for clarity and consistency with new language in other areas of the Bay Plan. The policy also makes it explicit that fill can be approved for shoreline protection—a practice in which the Commission has engaged for most of its existence, consistent with provisions in Section 66605 of the McAteer-Petris Act, which allow fill to establish a permanent shoreline, minimal amounts of fill to improve shoreline appearance, and fill for water-oriented uses.
Add underlined language and delete struck-through language as follows: 5. ~~To minimize the potential hazard to Bay fill projects and bayside development from subsidence, all proposed developments should be sufficiently high above the highest estimated tide level for the expected life of the project or sufficiently protected by levees to allow for the effects of additional subsidence for the expected life of the project, utilizing the latest information available from the U.S. Geological Survey and the National Ocean Service. Rights-of-way for levees protecting inland areas from tidal flooding should be sufficiently wide on the upland side to allow for future levee widening to support additional levee height so that no fill for levee widening is placed in the Bay.~~	The first part of the policy has been deleted and the last sentence of the policy has been moved to Policy 4. Proposed policy language in the Climate Change policy section and the Shoreline Protection section of the Bay Plan were inconsistent with the first part of this policy.

Add underlined language and delete struck-through language as follows: 6. Local governments and special districts with responsibilities for flood protection should assure that their requirements and criteria ~~reflect~~ address future relative sea level rise ~~and should assure~~ so that new structures and uses attracting people are not approved in current or future flood prone areas, ~~or in areas that will become flood prone in the future~~; and that structures and uses that are approved ~~approvable~~ will be built at stable elevations and are properly designed to assure long-term protection from ~~flood hazards~~ shoreline flooding.	Staff proposes minor revisions to language for clarification and consistency with other sections

Protection of the Shoreline. The staff preliminarily recommends the Commission revise the findings and policies in the *Protection of the Shoreline* policy section as shown below.

More context on how other findings and policies in this section of the Bay Plan relate to the proposed changes, especially those that the staff is not proposing to change, is available at http://www.bcdc.ca.gov/laws_plans/plans/sfbay_plan.shtml

~~Protection of the~~ Shoreline Protection	
Findings	**Staff Analysis**
Add underlined language as follows: a. Well designed shoreline protection projects, such as levees, wetlands, or riprap, can prevent shoreline erosion and damage from flooding.	The new finding explains that well designed shoreline protection provides protection against flooding and erosion.
Add underlined language and delete struck-through language as follows: ~~a.~~ b. ~~Erosion control~~ Because vast shoreline areas are vulnerable to flooding and because much of the shoreline consists of soft, easily eroded soils, shoreline protection projects are often needed to ~~protect~~ reduce damage to shoreline property and improvements ~~from erosion~~. ~~Because so much shoreline consists of soft, easily eroded soils, protective structures are usually required to stabilize and establish a permanent shoreline. These structures~~ Structural shoreline protection, such as riprap, breakwaters, levees, and seawalls, often requires periodic maintenance and reconstruction.	The finding has been updated to reflect why shoreline protection is needed and that it requires periodic maintenance. The finding was re-lettered from a to b.
Add underlined language and delete struck-through language as follows: ~~b~~. c. Most ~~erosion control~~ structural shoreline protection projects involve some fill, which can adversely affect natural resources, such as water surface area and volume, tidal circulation, and wildlife use. ~~marshes, and mudflats.~~ Structural shoreline protection can further cause erosion of tidal wetlands and tidal flats, prevent wetland migration to accommodate	The finding has been updated and significantly expanded to reflect new information regarding the full suite of impacts from structural shoreline protection. The finding was re-lettered from b to c.

sea level rise, create a barrier to physical and visual public access to the Bay, create a false sense of security and may have cumulative impacts. Physical and visual public access can be provided on levees and other protection structures. As the rate of sea level rise accelerates and the potential for shoreline flooding increases, the demand for new shoreline protection projects will likely increase. Some projects may involve extensive amounts of fill.	

~~*Protection of the*~~ *Shoreline* *Protection*	
Findings	**Staff Analysis**
Add underlined language and delete struck-through language as follows: ~~c~~. d. Structural shoreline protection ~~structures, such as riprap and sea walls, are~~ is most effective and less damaging to natural resources if ~~they are~~ it is the appropriate kind of structure for the project site and erosion and flood problem, and ~~are~~ is properly designed, constructed, and maintained. Because factors affecting erosion and flooding vary considerably, no single protective method or structure is appropriate in all situations. When a structure is not appropriate or is improperly designed and constructed to meet the unique site characteristics, flood conditions, and erosion forces at a project site, the structure is more likely to fail, require additional fill to repair, have higher long-term maintenance costs because of higher frequency of repair, and cause greater disturbance and displacement of the site's natural resources.	The finding has been updated to incorporate flooding and to clarify the challenges accompanying structural shoreline protection projects. The finding was re-lettered from c to d.
Add underlined language as follows: e. Addressing the impacts of sea level rise and shoreline flooding may require large-scale flood protection projects, including some that extend across jurisdictional or property boundaries. Coordination with adjacent property owners or jurisdictions to create contiguous, effective shoreline protection is critical when planning and constructing flood protection projects. Failure to coordinate may result in inadequate shoreline protection (e.g., a protection system with gaps or one that causes accelerated erosion in adjacent areas).	The new finding anticipates the desire for new and extensive shoreline protection as sea level rises and describes some of the issues that can arise where shoreline protection projects extend across jurisdictional and property boundaries.
Add underlined language and delete struck-through language as follows: ~~d~~ f. Nonstructural ~~erosion control~~ shoreline protection methods, such as tidal marshes ~~marsh plantings~~, can provide effective flood control but are typically effective for erosion control only in areas experiencing mild erosion. ~~However, i~~ In some instances, it may be possible to combine ~~marsh~~ habitat restoration, enhancement or protection with structural approaches to provide protection from flooding and control shoreline erosion, thereby minimizing the ~~erosion control~~ shoreline protection project's impact on natural resources.	The finding has been updated to be consistent with the language used in other findings and to reflect current information regarding flood protection provided by tidal marshes. Protecting existing habitats should be considered when designing shoreline protection. The finding was re-lettered from d to f.

~~*Protection of the*~~ *Shoreline* *Protection*	
Findings	**Staff Analysis**
Add underlined language and delete struck-through language as follows: ~~e.~~g. Loose dirt, concrete slabs, asphalt, bricks, scrap wood and other kinds of debris, are generally ineffective in halting shoreline erosion or preventing flooding and may lead to increased fill or release of pollutants. Although providing some short-term shoreline protection, protective structures constructed of such debris materials typically fail rapidly in storm conditions because the material slides bayward or is washed offshore. Repairing these ineffective structures requires additional material to be placed along the shoreline, leading to unnecessary fill and disturbance of natural resources.	The finding has been updated to include flood protection. The finding was re-lettered from e to g.
Policies	**Staff Analysis**
Add underlined language and delete struck-through language as follows: 1. New shoreline ~~erosion control~~ protection projects and the maintenance or reconstruction of existing ~~erosion control facilities~~ projects should be authorized if: (a) the project is necessary to protect shoreline development from flooding or erosion; (b) the type of the protective structure is appropriate for the project site, the uses to be protected, and the erosion and flooding conditions at the site; ~~and~~ (c) the project is properly engineered to provide erosion control and flood protection for the expected life of the project based on a 100-year flood event that takes future sea level rise into account; (d) the project is properly designed and constructed to prevent significant impediments to physical and visual public access; and (e) the protection is integrated with current or planned adjacent shoreline protection measures. Professionals knowledgeable of the Commission's concerns, such as civil engineers experienced in coastal processes should participate in the design.	The policy has been updated and expanded to reflect the potential need to provide protection for existing development from flooding due to sea level rise and storm activity. The update includes specific guidance regarding the circumstances for which a shoreline protection structure is allowable at a given location.

~~*Protection of the*~~ *Shoreline* *Protection*	
Policies	**Staff Analysis**
Add underlined language and delete struck-through language as follows: 2. Riprap revetments, the most common shoreline protective structure, should be constructed of properly sized and placed material that meet sound engineering criteria for durability, density, and porosity. Armor materials used in the revetment should be placed according to accepted engineering practice, and be free of extraneous material, such as debris and reinforcing steel. Generally, only engineered quarrystone or concrete pieces that have either been specially cast, are free of extraneous materials from demolition debris, and are carefully selected for size, density, and durability~~, and freedom of extraneous materials from demolition debris~~ will meet these requirements. Riprap revetments constructed out of other debris materials should not be authorized.	The policy has been updated to more clearly identify appropriate riprap materials.
Add underlined language and delete struck-through language as follows: 3. Authorized protective projects should be regularly maintained according to a long-term maintenance program to assure that the shoreline will be protected from tidal erosion and flooding and that the effects of the ~~erosion control~~ shoreline protection project on natural resources during the life of the project will be the minimum necessary.	The policy has been updated to incorporate shoreline flooding.
4. Whenever feasible and appropriate, shoreline protecti~~ve~~on projects should include provisions for nonstructural methods such as marsh vegetation and integrate shoreline protection and Bay ecosystem enhancement, using adaptive management. Along shorelines that support marsh vegetation, or where marsh establishment has a reasonable chance of success, the Commission should require that the design of authorized protecti~~ve~~on projects include provisions for establishing marsh and transitional upland vegetation as part of the protective structure, wherever feasible.	Staff proposes minor for clarification in response to comments.
Add underlined language as follows: 5. Adverse impacts to natural resources and public access from new shoreline protection should be avoided. Where ~~such~~ significant impacts cannot be avoided, mitigation or alternative public access should be provided.	The new policy requires mitigation and/or the provision of alternative public access when adverse impacts to natural resources and/or public access from shoreline protection are unavoidable.

Public Access. The staff preliminarily recommends the Commission revise the findings and policies in the *Public Access* policy section as shown below.

More context on how other findings and policies in this section of the Bay Plan relate to the proposed changes, especially those that the staff is not proposing to change, is available at http://www.bcdc.ca.gov/laws_plans/plans/sfbay_plan.shtml

Public Access	
Findings	**Staff Analysis**
Add underlined language as follows: f. <u>Accelerated flooding from sea level rise and storm activity will severely impact existing shoreline public access, resulting in temporary or permanent closures. Periodic and consistent flooding would increase damage to public access areas, which can then require additional fill to repair, raise maintenance costs, and cause greater disturbance and displacement of the site's natural resources. Risks to public health and safety from sea level rise and shoreline flooding may require new shoreline protection to be installed or existing shoreline protection to be modified, which may impede physical and visual access to the Bay.</u>	The new finding describes the range of impacts on public access from flooding from sea level rise and storm activity and identifies related issues, such as higher maintenance costs.
Add underlined language and delete struck-through language as follows: ~~h~~ <u>i</u>. Public access areas obtained through the permit process are most utilized if they provide physical access, provide connections to public rights-of-way, are related to adjacent uses, are designed, improved and maintained clearly to indicate their public character, and provide visual access to the Bay. <u>Flooding from sea level rise and storm activity increase the difficulty of designing public access areas (e.g., connecting new public access that is set at a higher elevation or located farther inland than existing public access areas).</u>	The finding has been updated to reflect the difficulties of designing public access in the face of sea level rise and related flooding. The finding was re-lettered from h. to i.
Add underlined language and delete struck-through language as follows: ~~k~~ <u>l</u>. Studies indicate that public access may have immediate effects on wildlife (including flushing, increased stress, interrupted foraging, or nest abandonment) and may result in adverse long-term population and species effects. Although some wildlife may adapt to human presence, not all species or individuals may adapt equally, and adaptation may leave some wildlife more vulnerable to harmful human interactions such as harassment or poaching. The type and severity of	The finding has been updated to recommend characterization of current and future wildlife habitats as they may be significantly altered by sea level rise and, thus, any impacts from public access on wildlife may be more serious than otherwise anticipated, or may change over time. The finding was re-lettered from k. to l.

Public Access	
Findings	**Staff Analysis**
effects, if any, on wildlife depend on many factors, including physical site configuration, species present, and the nature of the human activity. Accurate characterization of current and future site, habitat and wildlife conditions, and of likely human activities, would provide information critical to understanding potential effects on wildlife.	
Add underlined language and delete struck-through language as follows: ~~l~~ m. Potential adverse effects on wildlife from public access may be avoided or minimized by siting, designing and managing public access to reduce or prevent adverse human and wildlife interactions. Managing human use of the area may include adequately maintaining improvements, periodic closure of access areas, pet restrictions such as leash requirements, and prohibition of public access in areas where other strategies are insufficient to avoid adverse effects. Properly sited and/or designed public access can avoid habitat fragmentation and limit predator access routes to wildlife areas. In some cases, public access adjacent to sensitive wildlife areas may be set back from the shoreline a greater distance because buffers may be needed to avoid or minimize human disturbance of wildlife. Appropriate siting, design and management strategies depend on the environmental characteristics of the site, ~~and~~ the likely human uses of the site, and the potential impacts of future ~~sea level rise~~ climate change.	The finding has been updated to reflect the need to site and design public access that is compatible with wildlife even as sea level rises and sites change.
Add underlined language as follows: 5. Public access should be sited, designed, managed and maintained to avoid significant adverse impacts from sea level rise and shoreline flooding.	The new policy requires the creation of public access that will be resilient to sea level rise.
Add underlined language and delete struck-through language as follows: ~~5~~ 6. Whenever public access to the Bay is provided as a condition of development, on fill or on the shoreline, the access should be permanently guaranteed. This should be done wherever appropriate by requiring dedication of fee title or easements at no cost to the public, in the same manner that streets, park sites, and school sites are	The policy has been updated to require that permit conditions for public access account for sea level rise. Since a permit requiring public access is recorded with the property document the public access, where feasible, is guaranteed for the life of the project even if sea level rises.

Public Access	
Findings	**Staff Analysis**
dedicated to the public as part of the subdivision process in cities and counties. Depending on the nature and location of the development, this could include, among other things, requiring that ~~Any~~ public access provided as a condition of development ~~should either be required to~~ remains viable in the event of future sea level rise or flooding, or that ~~equivalent~~ access consistent with the project ~~should be~~ is provided nearby if land is available that can feasibly be developed and dedicated for public access.	