

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION

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TO: Commissioners and Alternates
FROM: Will Travis, Executive Director (415/352-3653 travis@bcdc.ca.gov)
Joseph LaClair, Chief Planner (415/352-3656 joel@bcdc.ca.gov)
SUBJECT: Staff Report and Revised Preliminary Recommendation for Proposed Bay Plan Amendment 1-08 Concerning Climate Change
(For Commission consideration on October 7, 2010)

Revised Preliminary Staff Recommendation Summary

The staff preliminarily recommends that the Commission:

1. Amend the Bay Plan Tidal Marsh and Tidal Flats findings and policies (pp. 3 through 7);
2. Add a new Climate Change findings and policies section to the Bay Plan at the beginning of Part IV “Developing the Bay and Shoreline: Findings and Policies” (pp. 8 through 18); and
3. Amend the Bay Plan Safety of Fills, Protection of the Shoreline, and Public Access findings and policies (pp. 18 through 28).

Background

BCDC first became concerned about the impacts of climate change on the Bay twenty years ago, when the Commission undertook a pioneering study on accelerated sea level rise and developed findings and policies in the Safety of Fills section of the Bay Plan to account for sea level rise in all projects that involve fill in the Bay. Aside from the increasing annual rate of sea level rise, other changes in the last twenty years necessitate a broader approach that addresses the overall impacts of climate change on San Francisco Bay, including, but not limited to, accelerated sea level rise.

Perhaps the biggest change in those twenty years is the attention received by the international, consensus-based approach to delivering scientific conclusions for policy-makers instigated by the United Nations Intergovernmental Panel on Climate Change (IPCC). Because the IPCC represents a wide range of scientific opinion, its conclusions are generally conservative, but widely accepted. However, another important change in the last twenty years is that the effects of climate change are already being observed. Conclusions in both the IPCC and state-sponsored work are based, in part, on observed changes in global surface temperature, ocean water temperature, ocean acidification, and land and sea ice melt. Finally, what was lacking twenty years ago was conclusive evidence that climate change is caused largely by human actions—primarily the release of carbon dioxide into the atmosphere. Today, such evidence solidly links the significant human contribution to greenhouse gases, beginning with industrialization, to increases in global temperature.

In 2006, the State of California employed IPCC scenarios to develop a report on climate change impacts in the state. In that same year, the legislature passed the Global Warming Solutions Act requiring reductions in greenhouse gas emissions. The most recent update to the IPCC assessment reports was in 2007 and, in 2008, the state reported the results of an updated analysis of climate change scenarios. Both reports conclude that the reduction of greenhouse gases now will reduce the degree to which the world must adapt to the effects of climate change. However, it is inevitable that over the next century global temperatures will increase 1° to 3° C (1.8° to 5.4° F). To deal with this increase in temperature, adapting to climate change and its impacts is both unavoidable and essential.



Making San Francisco Bay Better

Global warming is expected to result in sea level rise in San Francisco Bay of 16 inches (40 cm) by mid-century and 55 inches by the end of the century. The Pacific Institute estimated that the economic value of Bay Area shoreline development (buildings and their contents) at risk from a 55-inch rise in sea level is \$62 billion—nearly double the estimated value of development vulnerable to sea level rise along California’s Pacific Ocean coastline. An estimated 270,000 people in the Bay Area will be at risk of flooding, 98 percent more than are currently at risk from flooding. In those areas where lives and property are not directly vulnerable, the secondary and cumulative impacts of sea level rise will affect public health, economic security and quality of life.

By mid-century, 180,000 acres of Bay shoreline are vulnerable to flooding, and 213,000 acres are vulnerable by the end of the century. Vulnerability within today’s 100-year floodplain will increase from a one percent chance of flooding per year to a 100 percent chance of flooding per year by mid-century. As a result of higher sea level combined with storm activity, extreme storm events will cause most of the shoreline damage from flooding.

The scope of changes in the Bay and on its shoreline from climate change cut across multiple policy sections of the Bay Plan. Currently, sea level rise policies are located in Safety of Fills. In 2000, the Tidal Marshes and Tidal Flats policy section was amended, and the issue of sea level rise was included in a list of requirements for the analysis of restoration projects. The projected impacts of climate change affect nearly every policy section of the Bay Plan. One approach for addressing these impacts would be to amend every affected policy section. However, individual Bay Plan policies are never applied in isolation from other policies. Therefore, the most effective approach is to create a new Climate Change policy section that can be used with other policy sections of the Bay Plan and to update only those particular sections that require more specific clarity.

Background material for the proposed amendment is presented in the staff background report entitled, *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline*, dated April 7, 2009, that provides the information for the staff’s proposed changes to the Bay Plan that follow in this staff report and preliminary recommendation.

Public Hearings and Workshops

The Commission held three public hearings on the proposed Bay Plan Amendment No. 1-08 on May 7, June 4, and July 16, 2009 as described in staff’s first preliminary recommendation, dated April 7, 2009. Staff conducted three public workshops on September 15, 16 and 17, 2009 in Vallejo, Palo Alto and San Francisco to gather public feedback on the revisions being developed for staff’s second preliminary recommendation. Staff responses to public hearing comments, both written and spoken were included with staff’s October 1, 2009 revised (second) preliminary recommendation and incorporated where appropriate. A summary of comments received at the three public workshops was mailed separately. The Commission held a public hearing on November 5, 2009 and conducted a public workshop at its December 3, 2009 meeting.

The Commission directed its staff to work with those members of the public and advocacy organizations who continued to express concerns about the proposed amendments. The staff met with representatives of the Bay Planning Coalition, the Bay Area Council, several Bay Area development companies, Save the Bay, Golden Gate Audubon, the Friends of Redwood City, the Committee for Green Foothills and Citizens Committee to Complete the Refuge, among others. This consultation extended into early summer, and the input is incorporated in this revised preliminary recommendation where appropriate. Comment letters provided by these organizations outside of the public hearing were mailed separately from this third staff preliminary recommendation.

Revised (Third) Preliminary Recommendation

The staff preliminarily recommends that the Commission amend the Bay Plan as follows:

1. **Proposed Additions to Bay Plan Findings and Policies**

- a. Create a climate change policy section of the Bay Plan that addresses the following:
 - (1) Incorporating sea level rise scenarios and using them in the permitting process;

- (2) Developing a long-term strategy to address sea level rise and storm activity and other Bay-related impacts of climate change in a way that protects the shoreline and the Bay and allows for appropriate, well-planned development that respond to the impacts of climate change and future sea level rise;
- (3) Working with the Joint Policy Committee (JPC) and other agencies to integrate regional mitigation and adaptation strategies and adaptation responses of multiple government agencies, to analyze and support equity issues, and to support research that provides useful climate change information and tools;
- (4) Providing recommendations and requirements to guide planning and permitting of development in areas vulnerable to sea level rise; and
- (5) Including policies that promote wetland protection, creation, enhancement and migration.

2. Proposed Changes to Existing Bay Plan Findings and Policies

- a. Amend the findings and policies on tidal marshes and tidal flats to ensure that buffer zones are incorporated into restoration projects where feasible and sediment issues related to sustaining tidal marshes are addressed.
- b. Amend the policies on safety of fills by updating the findings and policies on sea level rise and moving some to the new climate change section of the Bay Plan.
- c. Amend the policies on protection of the shoreline to address protection from future flooding.
- d. Amend the findings and policies on public access to provide public access that is sited, designed and managed to avoid significant adverse impacts from sea level rise and ensure long-term maintenance of public access areas through site-specific adaptive management strategies.

Proposed Additions and Deletions to Bay Plan Findings and Policies

The following format has been used to clarify additions and deletions in staff's revised (third) preliminary recommendation:

1. Proposed additions in language are shown as underlined, while proposed language deletions are shown as ~~struck through~~.
2. Reasons for the proposed changes are included in the Staff Analysis in the right column.
3. Existing Bay Plan language is shown as plain text.

Copies of staff's preliminary recommendation and revised (second) preliminary recommendation are available on the Commission's website at:

http://www.bcdc.ca.gov/proposed_bay_plan/bp_amend_1-08.shtml.

Tidal Marshes and Tidal Flats. The staff preliminarily recommends the Commission revise the findings and policies in the "Tidal Marshes and Tidal Flats" 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.

Tidal Marshes and Tidal Flats	
Findings	Staff Analysis
<p>Add underlined language and delete struck-through language as follows:</p> <p>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></p>	<p>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.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>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></p>	<p>The finding has been updated to include impacts from past activities that will affect the sustainability of tidal marshes as sea level rises.</p>
<p>Add underlined language as follows:</p> <p>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></p>	<p>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.</p>

Tidal Marshes and Tidal Flats	
Findings	Staff Analysis
<p>Add underlined language and delete struck-through language as follows:</p> <p>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.</p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>m. <u>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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>n. <u>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.</u></p>	<p>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.</p>

Tidal Marshes and Tidal Flats	
Findings	Staff Analysis
<p>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.</p>	<p>The finding was re-lettered from l. to o.</p>
<p>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.</p>	<p>The finding was re-lettered from m. to p.</p>
<p>Policies 1 through 3—no changes</p>	
<p>Add underlined language and delete struck-through language as follows:</p> <p>4. Where and whenever possible <u>feasible</u>, 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</p>	<p>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.</p>

Tidal Marshes and Tidal Flats	
Policies	Staff Analysis
<p>restored to tidal action <u>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.</u> 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 <u>and wetland migration.</u></p>	
<p>Add underlined language and delete struck-through language as follows:</p> <p>5. <u>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.</u></p>	<p>The new policy recommends supporting sediment research and monitoring that can inform future management decisions on projects in the Bay, particularly wetland restoration projects.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>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 <u>relative how the system's adaptive capacity can be enhanced so that it is resilient to sea level rise and climate change;</u> (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) <u>an appropriate buffer, where feasible, between shoreline development and habitats to protect wildlife and provide space for marsh migration as sea level rises;</u> and (j) site characterization. If success criteria are not met, appropriate corrective <u>adaptive</u> measures should be taken.</p>	<p>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.</p>

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.

Climate Change	
Findings	Staff Analysis
<p>Add underlined language as follows:</p> <p>a. <u>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.</u></p>	<p>The new finding describes the causes of climate change.</p>
<p>Add underlined language as follows:</p> <p>b. <u>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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>c. <u>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 California, recent observations of global greenhouse</u></p>	<p>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 (23-55 inches)) as a guide for implementing the policies.</p>

Climate Change	
Findings	Staff Analysis
<p><u>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. Therefore, to minimize flood risk, it is prudent to rely on higher projections in the range of possible future sea level rise.</u></p>	
<p>Add underlined language as follows:</p> <p>d. <u>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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>e. <u>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, is responsible for protecting the public and the Bay ecosystem from flood hazards. This can be best achieved by using higher emissions scenarios, 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 development that cannot be adapted to sea level rise.</u></p>	<p>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.</p>

Climate Change	
Findings	Staff Analysis
<p>Add underlined language as follows:</p> <p>f. <u>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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>g. <u>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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>h. <u>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.</u></p>	<p>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</p>

Climate Change	
Findings	Staff Analysis
<p>Add underlined language as follows:</p> <p>i. <u>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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>j. <u>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.</u></p>	<p>The new finding defines sustainability in the context of climate change, resilience and adaptive capacity.</p>
<p>Add underlined language as follows:</p> <p>k. <u>Shoreline development and infrastructure, critical to public and environmental health and the region's economic prosperity, are 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.</u></p>	<p>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.</p>

Climate Change	
Findings	Staff Analysis
<p>Add underlined language as follows:</p> <p>l. <u>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.</u></p>	<p>The new finding describes the impacts of flooding on shoreline recreation areas and trails.</p>
<p>Add underlined language as follows:</p> <p>m. <u>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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>n. <u>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.</u></p>	<p>The new finding describes the particular vulnerabilities of residential communities to flooding, especially low-income residents, the elderly and those with disabilities.</p>
<p>Add underlined language as follows:</p> <p>o. <u>Approaches for ensuring public safety in developed vulnerable shoreline areas include: (1) protecting existing development; (2) accommodating flooding by building structures that are resilient (3) discouraging permanent new development; (4) allowing only interim new uses that can be removed or phased out as inundation threats increase; and (5) removing existing development.</u></p>	<p>The new finding describes the range of potential human development responses to sea level rise.</p>

Climate Change	
Findings	Staff Analysis
<p>Add underlined language as follows:</p> <p>p. <u>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. Some vulnerable shoreline areas are already improved with development that has regionally significant economic, cultural or social value, and can accommodate infill development.</u></p>	<p>The new finding defines infill development in the context of Bay Area shoreline development that considers sea level rise.</p>
<p>Add underlined language as follows:</p> <p>q. <u>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 if they do not significantly increase overall risks to public safety.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>r. <u>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, infill or redevelopment in low-lying areas can be clustered on a portion of the property to reduce the area that must be protected; 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; measures can be incorporated that will achieve resilience and sustainability in all elements of the project; and 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 in the future.</u></p>	<p>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.</p>

Climate Change	
Findings	Staff Analysis
<p>Add underlined language as follows:</p> <p>s. <u>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 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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>u. <u>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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>v. <u>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. 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.</u></p>	<p>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.</p>

Climate Change	
Findings	Staff Analysis
<p>Add underlined language as follows:</p> <p>1. <u>When planning shoreline areas or designing larger shoreline projects, a risk assessment should be prepared, based on the estimated 100-year flood elevations that take future sea level rise 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 available, should be used in the risk assessment.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>2. <u>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 within existing urbanized areas that likely will be protected whether or not the infill takes place—should be designed to be resilient to a mid-century sea level rise projection based upon a risk assessment conducted for the project. 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.</u></p>	<p>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 an end-of-century sea level rise projection.</p>
<p>Add underlined language as follows:</p> <p>3. <u>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.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>4. <u>Wherever feasible and appropriate, effective, innovative sea level rise adaptation approaches should be encouraged.</u></p>	<p>The new policy encourages the development and implementation of innovative sea level rise adaptation strategies.</p>

Climate Change	
Policies	Staff Analysis
<p>Add underlined language as follows:</p> <p>5. <u>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 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 and regularly updated in consultation with government agencies with authority over flood protection.</u></p> <p><u>The regional strategy should determine where existing development should be protected and infill development encouraged, where new development should be permitted, where existing development should eventually be removed to allow the Bay to migrate inland.</u></p>	<p>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.</p> <p>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; and it includes sustainability as a criteria.</p>
<p><u>The goals of the strategy should be to:</u></p> <p>a. <u>advance regional public safety and prosperity by protecting most existing 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;</u></p>	
<p>b. <u>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;</u></p>	

Climate Change	
Policies	Staff Analysis
<ul style="list-style-type: none"> c. <u>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;</u> d. <u>encourage innovative approaches to sea level rise adaptation;</u> e. <u>identify a framework for integrating the adaptation responses of multiple government agencies;</u> f. <u>integrate regional mitigation measures designed to reduce greenhouse gas emissions with regional adaptation measures designed to address the unavoidable impacts of climate change;</u> g. <u>advance regional sustainability, encourage infill development and job creation, and provide diverse housing served by transit;</u> h. <u>address any existing contamination and the implications of the contamination on water quality;</u> i. <u>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;</u> j. <u>identify actions to prepare and implement the strategy, including any needed changes in law; and</u> k. <u>identify mechanisms to provide information, tools, and financial resources so local governments can integrate regional climate change adaptation planning into local community design processes.</u> 	
<p>Add underlined language as follows:</p> <p>6. <u>Until a regional sea level rise adaptation strategy can be completed, when planning or regulating new development in areas vulnerable to future shoreline flooding, new projects should be limited to:</u></p> <ul style="list-style-type: none"> a. <u>minor repairs of existing facilities or small projects that do not increase risks to public safety;</u> b. <u>transportation facilities, public utilities or other critical infrastructure that is necessary for the continued viability of existing development;</u> 	<p>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 minor repairs or small projects that do not increase risks to public safety, infill, natural resource restoration or enhancement, development providing significant regional benefits, interim 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.</p>

Climate Change	
Policies	Staff Analysis
<p>c. <u>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;</u></p> <p>d. <u>redevelopment that will remediate existing environmental degradation or contamination, particularly on closed military bases, if the redevelopment will (1) provide significant regional benefits and meet regional goals by concentrating employment or housing near adequate transit service sufficient to serve the project, and (2) include the following elements: (i) 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; (ii) measures that will achieve resilience and sustainability in all elements of the project; (iii) a permanent financial strategy that will guarantee the general public will not be burdened with the cost of protecting the project from any sea level rise or storm damage in the future; or;</u></p> <p>e. <u>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 shoreline protection during the life of the project.</u></p> <p>f. <u>public parks, natural resource restoration or environmental enhancement projects;</u></p>	
<p>7. <u>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.</u></p>	<p>The new policy advocates for good government and coordination in project reviews when jurisdictions overlap.</p>

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
<p>Add underlined language and delete struck-through language as follows:</p> <p>f. Flood damage to fills and shoreline areas can result from a combination of <u>sea level rise, storm surge, heavy rainfall, high tides, and winds blowing onshore. The most effective way</u> To prevent such damage, <u>is to locate projects and facilities structures</u> on fill or near the shoreline should be above the a <u>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 or are adaptively designed and managed to address sea level rise over time.</u></p>	<p>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.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>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</p>	<p>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.</p>

Safety of Fills	
Findings	Staff Analysis
<p>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 relative rise in sea level than other areas. <u>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.</u></p>	
Policies	Staff Analysis
<p>Add underlined language and delete struck-through language as follows:</p> <p>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 <u>Geological</u> Survey, for purposes of data comparison and evaluation.</p>	<p>The policy has been updated to include the correct name of the U.S. Geological Survey.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>4. <u>Adequate measures should be provided 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</u></p>	<p>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.</p>

Safety of Fills	
Policies	Staff Analysis
<p>projects. 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 <u>will not be</u> subject to dynamic wave energy; <u>be built so</u> In all cases, the bottom floor level of structures should <u>will</u> be above a <u>the highest estimated tide 100-year flood elevation that takes future sea level rise into account for the expected life of the project; 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. 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.</u></p>	<p>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.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>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.</p>	<p>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.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>6. Local governments and special districts with responsibilities for flood protection should assure that their requirements and criteria reflect <u>address</u> future relative sea level rise and should assure so that new structures and uses attracting people are not approved in <u>current or future</u> flood prone areas, or in areas that will become flood prone in the future; and that structures and uses that are <u>approved</u> approvable will be built at stable elevations and are properly designed to assure long-term protection from flood hazards <u>shoreline flooding</u>.</p>	<p>Staff proposes minor revisions to language for clarification and consistency with other sections</p>

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
<p>Add underlined language as follows:</p> <p>a. <u>Well designed shoreline protection projects, such as levees, wetlands, or riprap, can prevent shoreline erosion and damage from flooding.</u></p>	<p>The new finding explains that well designed shoreline protection provides protection against flooding and erosion.</p>
<p>Delete struck-through language as follows:</p> <p>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 <u>reduce damage to</u> 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, levees, and seawalls, often requires periodic maintenance and reconstruction.</p>	<p>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.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>b. c. Most erosion control <u>structural shoreline protection</u> projects involve some fill, which can adversely affect natural resources, such as water surface area and volume, tidal circulation, <u>and</u> wildlife use. marshes, and mudflats. <u>Structural shoreline protection can further cause erosion of tidal wetlands and tidal flats, prevent wetland migration to accommodate 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.</u> Physical and visual public access can be provided on levees and other protection structures. <u>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.</u></p>	<p>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.</p>

Protection of the Shoreline Protection	
Findings	Staff Analysis
<p>Add underlined language and delete struck-through language as follows:</p> <p>e. d. <u>Structural shoreline protection structures, such as riprap and sea walls, are</u> is most effective and less damaging to natural resources if they are <u>it is</u> the appropriate kind of structure for the project site and erosion and flood problem, and are <u>is</u> 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 <u>site characteristics, flood conditions, and erosion forces</u> 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.</p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>e. <u>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).</u></p>	<p>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.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>d <u>f.</u> Nonstructural erosion control <u>shoreline protection</u> methods, such as <u>tidal marshes marsh plantings,</u> can <u>provide effective flood control</u> but are typically effective <u>for erosion control</u> only in areas experiencing mild erosion. However, <u>i</u> In some instances, it may be possible to combine <u>marsh habitat restoration, enhancement or protection</u> with structural approaches to <u>provide protection from flooding and</u> control shoreline erosion, thereby minimizing the erosion control <u>shoreline protection</u> project's impact on natural resources.</p>	<p>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.</p> <p>The finding was re-lettered from d to f.</p>

Protection of the Shoreline Protection	
Findings	Staff Analysis
<p>Add underlined language and delete struck-through language as follows:</p> <p>e.g. Loose dirt, concrete slabs, asphalt, bricks, scrap wood and other kinds of debris, are generally ineffective in halting shoreline erosion <u>or preventing flooding</u> 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.</p>	<p>The finding has been updated to include flood protection. The finding was re-lettered from e to g.</p>
Policies	Staff Analysis
<p>Add underlined language and delete struck-through language as follows:</p> <p>1. New shoreline erosion control <u>protection</u> projects and the maintenance or reconstruction of existing erosion control facilities <u>projects</u> should be authorized if: (a) the project is necessary <u>to protect existing shoreline development from flooding or erosion</u>; (b) the type of the protective structure is appropriate for the project site, the uses to be protected, and the erosion <u>and flooding</u> conditions at the site; and (c) the project is properly <u>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</u>; (d) the project is properly designed and constructed <u>to prevent significant impediments to physical and visual public access</u>; and (e) <u>the protection is integrated with current or planned adjacent shoreline protection measures</u>. Professionals knowledgeable of the Commission's concerns, such as civil engineers experienced in coastal processes should participate in the design.</p>	<p>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.</p>

Protection of the Shoreline Protection	
Policies	Staff Analysis
<p>Add underlined language and delete struck-through language as follows:</p> <p>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, <u>are free of extraneous materials from demolition debris</u>, and are carefully selected for size, density, <u>and durability</u>, and freedom of extraneous materials from demolition debris will meet these requirements. Riprap revetments constructed out of other debris materials should not be authorized.</p>	<p>The policy has been updated to more clearly identify appropriate riprap materials.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>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 <u>and flooding</u> and that the effects of the erosion control <u>shoreline protection</u> project on natural resources during the life of the project will be the minimum necessary.</p>	<p>The policy has been updated to incorporate shoreline flooding.</p>
<p>4. Whenever feasible and appropriate, shoreline <u>protective</u> 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 <u>protective</u> projects include provisions for establishing marsh and transitional upland vegetation as part of the protective structure, wherever feasible.</p>	<p>Staff proposes minor for clarification in response to comments.</p>
<p>Add underlined language as follows:</p> <p>5. <u>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.</u></p>	<p>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.</p>

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
<p>Add underlined language as follows:</p> <p>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></p>	<p>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.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>h i. 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></p>	<p>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.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>k l. 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</p>	<p>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.</p>

Public Access	
Findings	Staff Analysis
<p>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 <u>current and future</u> site, habitat and wildlife conditions, and of likely human activities, would provide information critical to understanding potential effects on wildlife.</p>	
<p>Add underlined language and delete struck-through language as follows:</p> <p>‡ <u>m.</u> 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 <u>climate change.</u></p>	<p>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.</p>
<p>Add underlined language as follows:</p> <p>5. <u>Public access should be sited, designed, managed and maintained to avoid significant adverse impacts from sea level rise and shoreline flooding.</u></p>	<p>The new policy requires the creation of public access that will be resilient to sea level rise.</p>
<p>Add underlined language and delete struck-through language as follows:</p> <p>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</p>	<p>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 is guaranteed for the life of the project even if sea level rises.</p>

Public Access	
Findings	Staff Analysis
<p>dedicated to the public as part of the subdivision process in cities and counties. <u>Any public access provided as a condition of development should either be required to remain viable in the event of future sea level rise or flooding, or equivalent access consistent with the project should be provided nearby.</u></p>	

Amendment Consistency with the McAteer-Petris Act

Section 66652 of the McAteer-Petris Act requires that amendments of the Bay Plan be consistent with the Findings and Declarations of Policy in the McAteer-Petris Act. The relevant Findings and Declarations of Policy sections of the McAteer-Petris Act are Section 66605 regarding fill in the Bay, Section 66602 regarding public access and Section 66632.4 regarding the Commission’s authority to issue permits in the shoreline band.

Section 66605 of the McAteer-Petris Act states, in part: (a) the public benefits from fill must clearly exceed the public detriment from the loss of water areas, and fill should be limited to water-oriented uses, such as bridges; (b) no alternative upland location exists for the fill; (c) the fill should be the minimum amount necessary; (d) the fill should minimize harmful effects to the Bay including the water volume, circulation, and quality, fish and wildlife resources, and marsh fertility; (e) the fill should be constructed in accordance with sound safety standards. The McAteer-Petris Act broadly defines the term “fill” to include “earth or any other substance or material, including pilings or structures placed on pilings, and structures floating at some or all times and moored for extended periods....” The updated findings and policies pertain to several types of fill.

The amendment will add a new climate change policy section to the Bay Plan that includes policies that require evaluation of sea level rise and storm activity for permit decisions regarding fill. The proposed policies anticipate future desire to place fill for shoreline protection and in areas that are vulnerable to flooding from sea level rise and provides guidance on the circumstances under which such fill is allowable, so that such fill is consistent with the provisions of Section 66605. Therefore, the portion of the amendment that proposes to add a new climate change section to the Bay Plan is consistent with Section 66605 of the McAteer-Petris Act.

The amendment will revise existing policies regarding protection of the shoreline, which currently addresses shoreline protection to minimize erosion. The proposed revisions to the findings and policies would expand the scope of the policy section to address flooding in addition to erosion, thereby anticipating again the future desire to construct additional shoreline protection or modify existing shoreline protection as sea level rises. The revisions encourage the use of natural shoreline protection, when feasible, and the minimization of harmful effects to the Bay so that fill for shoreline protection is consistent with Section 66605 of the McAteer-Petris Act.

The amendment further will revise existing policies in the Tidal Marshes and Tidal Flats policy section of the Bay Plan to improve the analysis of climate change impacts required for marsh restoration (which usually involves fill) so that marshes are more likely to sustain the impacts of climate change and adapt over time.

For all of the reasons above, the proposed amendment is consistent with Section 66605 of the McAteer-Petris Act.

Section 66632.4 of the McAteer-Petris Act applies within the Commission’s shoreline band jurisdiction and allows that the Commission may only deny a permit for a project that: (1) fails to provide maximum feasible public access consistent with the project; or (2) conflicts with the use designated in a priority use area. The Commission can only condition a permit—require changes to the project—to bring the project into compliance with the requirement to provide maximum feasible

public access and to be consistent with a priority use. Section 66602 of the McAteer-Petris Act states that existing public access to the shoreline and waters of San Francisco Bay is inadequate and that maximum feasible public access, consistent with a proposed project, should be provided. A portion of this proposed amendment would revise the public access findings and policies. The policies would be updated to reflect the significant vulnerabilities of shoreline public access to flooding from sea level rise and the need to maintain and guarantee public access for the life of the project. The proposed amendment is therefore consistent with Sections 66602 and 66632.4 of the McAteer-Petris Act.

Environmental Assessment

The proposed amendment must meet the requirements of the McAteer-Petris Act and the Commission's standards for environmental review through an Environmental Assessment. Environmental Assessments are prepared in conformance with the Commission's regulations (CCR, Title 14, Section 11511-11512), which have been certified by the Secretary of Resources as functionally equivalent to the California Environmental Quality Act (CEQA). Because the proposed amendment is a programmatic policy change rather than a specific project with more precise quantifiable impacts, the discussion is more general in the background report entitled, *Living with a Rising Bay: Vulnerability and Adaptation in the San Francisco Bay and on its Shoreline*, than an environmental assessment for a specific project.

The proposed amendment addresses the need to update the sea level rise findings and policies that were created twenty years ago and to address other impacts caused by climate change. In the last twenty years, international scientific consensus has concluded that climate change is already occurring, that human activities that release greenhouse gases have caused climate change, and that some warming is inevitable no matter how much the world reduces greenhouse gas emissions. Scientists have already observed higher surface and ocean temperature, rising sea level, and increased rates of ice melt. Most notably, scientist project that sea level will continue to rise, long after greenhouse gas emissions are reduced. The background report incorporates the Environmental Assessment and is the fundamental basis of the staff report analysis and staff's recommended changes to the Bay Plan. Specifically, the staff background report provides an environmental assessment of the proposed amendment through: (1) analysis of the causes and effects of sea level rise and the use of scenarios for determining vulnerability; (2) analysis of shoreline vulnerability to flooding from sea level rise and storm activity; (3) analysis that identifies vulnerabilities in the Bay ecosystem to the effects of climate change; (4) analysis of vulnerabilities in Bay and shoreline governance; and (5) analysis of adaptation strategies that reduce vulnerabilities and increase resilience.

The resulting proposed revisions to the Bay Plan, as discussed in the background report and outlined in the proposed amendment to address climate change serve to update the Bay Plan to better reflect scientific understanding of climate change and sea level rise and to provide further guidance to minimize adverse impacts from climate change. Therefore, as described in the accompanying staff report, the proposed amendment will have no significant adverse environmental impacts.

Furthermore, the proposed amendment of the Bay Plan would not affect the Commission's ability to require specific environmental review of projects proposed in its jurisdiction under the provisions of the McAteer-Petris Act, the Bay Plan, the California Environmental Quality Act of 1970, and the Commission's federally-approved Management Program for the San Francisco Bay. Specific project review would require a more detailed level of environmental analysis than that required for a policy change to the Bay Plan, which is a general policy plan.

Response to Comments Received During the Public Comment Period and Public Hearing

Below are letters and spoken comments received from the public and Commissioners during the 30-day public comment period prior to the public hearing and at the public hearing on November 5, 2009 and staff responses to those comments. In some cases responses to one comment serve to respond to other similar comments. Comments received outside the public hearing were mailed under separate cover to the Commission, Alternates and interested parties without responses.

Barbara Salzman, Friends of the Estuary, October 23, 2009. Staff response below corresponds to Friends of the Estuary's comment letter received on October 23, 2009.

1. Proposed climate change policy 5 states that the Commission will work with other agencies and the general public to develop a regional sea level rise adaptation strategy. The term "general public" should be taken to include community and nonprofit groups. Proposed policy 7 provides that where jurisdictions or policies overlap, the Commission should coordinate with other agencies in the review of projects.
2. Comment noted.
3. Climate change finding h. discusses the need for innovation and testing of adaptation strategies and states that adaptive management, as well as testing and refinement, and will be needed to develop effective, innovative adaptation approaches.
4. The comment accurately summarizes the proposed policy approach for structural and natural shoreline protection strategies. Proposed revisions to tidal marshes and tidal flats finding l. state in part that "Scientists studying the Bay observed that 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." Proposed climate change policy 5(b) states that one of the goals of the regional strategy is to "enhance the Bay ecosystem (e.g., Bay habitats, fish, wildlife and other aquatic organisms) by ... assuring adequate volumes of sediment for marsh accretion..." and 5(c) supports developing a regional strategy that includes feasible measures that incorporate natural Bay habitat for flood control and erosion prevention. Tidal marshes and tidal flats finding m. has been revised to add the words "for wetlands" to the end of the statement that monitoring of sediment processes can inform management efforts to maintain an adequate supply of sediment. Finally, the climate change policies call for an update to the region's Baylands Ecosystem Habitat Goals, which would include an integrated approach to watershed and sediment management.
5. The proposed revision to climate change policy 5(a) states that the goals of a regional strategy should include protecting most existing shoreline development, especially development that provides regionally significant benefits. The proposed climate change policy 6 states that, "until a regional strategy is completed, new development should be... limited to infill and redevelopment that will remediate environmental degradation or contamination, particularly on closed military bases," and provides a list of conditions that the proposed redevelopment should meet. This policy is consistent with the CCMP goal of promoting smart growth and compact development to protect remaining open space and floodplains in the San Francisco Bay's watersheds. The proposed policies do not prohibit or discourage development in low-lying areas vulnerable to sea level rise.
6. Proposed climate change finding m. states in part that "Tidal high marsh and adjacent ecotones are essential to many tidal marsh species, including endangered species. " Tidal marshes and tidal flats finding e. states that transition zones contain a rich mixture of vegetation types, including many of the Bay's rare plants, and they provide food, shelter and high-tide refugia for wildlife, including the salt marsh harvest mouse and California black rail. This finding is not proposed for revision. Therefore, this information does not need to be repeated in tidal marshes and tidal flats Policy 6(h).
7. Comment noted.

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AN FRANCISCO BAY CONSERVATION
& DEVELOPMENT COMMISSION



VIA EMAIL

Sean Randolph, Chaimlan
Bay Conservation and Development Commission
50 California Street, 26th Floor
San Francisco, CA 94111

RE: Comments on BCDC Bay Plan Climate Change Policies 10/23/09

Dear Mr. Randolph and Commissioners:

Friends of the San Francisco Estuary (Friends) would like to offer its support for the new Climate Change policy section of the Bay Plan. The policies and findings are an acknowledgement and proactive step towards limiting the risk, of sea-level rise associated with climate change while protecting current and future wetland habitat of the San Francisco Bay Estuary. The policies follow the objectives outlined in the San Francisco Estuary Partnership's Comprehensive Conservation and Management Plan (CCMP) Land Use action 2.1. Friends strongly encourages BCDC to work closely with other regulatory, land use, and resource agencies, and community and nonprofit groups, to integrate the policies into other Bay Area planning efforts.

Friends would like to highlight the following topics covered by a number of the Climate Change findings and policies as a model to adapt the estuary to inevitable rise of the San Francisco Bay.

- The findings consistently acknowledge the need to develop flexible strategies to adapt to sea-level rise. Many of the technologies to best address sea-level rise have yet to be developed. Additionally, many large-scale adaptive strategies have yet to be tested. Flood protection implementation decisions should be based on the premise of site-specific solutions and the best science, and information available. A "one-size-fits-all" solution to sea-level rise will not provide the maximum benefit to local habitats or flexibility for the flood control system to adapt to changing circumstances. These innovations will require adaptive management.

Board of Directors

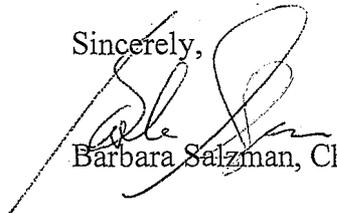
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- The policies support soft (using wetlands and buffer zones) protection from sea-level rise and discourages but does not prohibit hard sea walls. While there are many cases along the Bay where sea walls may be necessary, there are ample opportunities to use natural systems and wetlands to protect areas from sea-level rise. These soft barriers can also provide vital space for upland migration of wetlands under threat from sea-level rise. It is important to recognize that shorelines and associated wetlands are connected to and part of their watersheds. While Regional Sediment Management is identified a key adaptation strategy element, it should contain a reference to actively managing sediment transport processes from the uplands via fluvial processes that enable tidal wetlands and other buffers to remain viable. 4
- Friends also applauds BCDC for beginning to address the challenges presented to neighborhoods and communities at risk from sea-level rise. The historic and cultural significance of these communities must be considered as part of any adaptation strategy. While relocation of threatened communities may be an option, protecting existing communities must be the first priority. That said, Friends also agrees with the policy that new development should not be considered in areas outside of current urban service areas at risk of sea-level rise. These policies also conform to the CCMP land use actions 2.2 and 2.3 addressing smart growth and compact development to protect remaining open space and floodplains in the San Francisco Bay's watersheds. S
- Finally, it is important to note in Tidal Marshes and Mudflats Finding, that in addition to the functions mentioned, that buffers are transition habitats that provide refugia and other habitat for endangered, special status, migratory and native wildlife. We recommend that policy 6 (h) be revised as follows: "...to protect wildlife and provide transition zone habitat for endangered, other special status, migratory and resident wildlife species." 6

Friends hopes to work with BCDC on the continued protection and restoration of the San Francisco Bay estuary. 7

Sincerely,



Barbara Salzman, Chair

Margaret Kettunen Zegart, October 27, 2009. Staff response below corresponds to Ms. Zegart's comment letter received on October 27, 2009.

1. The McAteer-Petris Act, Section 66610, defines the Commission's San Francisco Bay jurisdiction as "all areas that are subject to tidal action from the south end of the bay to the Golden Gate (Point Bonita-Point Lobos) and to the Sacramento River line (a line between Stake Point and Simmons Point, extended northeasterly to the mouth of Marshall Cut), including all sloughs, and specifically, the marshlands lying between mean high tide and five feet above mean sea level; tidelands (land lying between mean high tide and mean low tide); and submerged lands (land lying below mean low tide)." This definition includes Richardson Bay. All section of the Bay Plan apply to the Commission's jurisdiction. Therefore, it is not necessary to state that the climate change policies apply to Richardson Bay.
2. Proposed climate change policy 5 states that the Commission will work with other agencies and the general public to develop a regional sea level rise adaptation strategy. One of the goals of the regional strategy is to identify areas where tidal wetlands and tidal flats can migrate landward. Proposed shoreline protection policy 4 states that, whenever feasible and appropriate, shoreline protection projects should include provisions for nonstructural methods such as marsh vegetation.
3. Proposed safety of fills policy 6 states that "[l]ocal governments and special districts with responsibilities for flood protection should assure that new structures and uses attracting people are not approved in current or future flood prone areas; and that structures and uses that are approved will be built at stable elevations and are properly designed to assure long-term protection from shoreline flooding." Also, the proposed language ("shall") is prescriptive. Given the construction of the Bay Plan findings and policies, prescriptive language is used only in policies, not findings.
4. Proposed climate change finding n. includes the phrase "the elderly" as a population that may need special assistance. Regional planning to address sea level rise risks is addressed in proposed climate change policy 5, and calls for a strategy that would determine whether or not development should be permitted in areas that are vulnerable to flooding.
5. At its June 4, 2009 public hearing on this amendment, the Commission considered whether to seek additional interim authority over vulnerable low-lying areas while it pursued developing a regional adaptation strategy. The Commission decided to proceed with the public hearings and complete its work on the current proposed amendment to the Bay Plan, commence the development of regional strategy in partnership with other agencies and the public, and then develop proposed legislation to address climate change on a more comprehensive regional basis, based on the outcome of the collaborative planning process. The Commission's strategic plan directs staff to prepare draft legislation that would direct the Commission to develop a policy framework for addressing sea level rise in the Bay and along its shoreline.

Thursday, October 29, 2009 8:19 AM

Subject: CLIMATE CHANGE AMENDMENTS, NOV. S planning commission
 Date: Thursday, October 29, 2009 1:12 AM
 From: KEm@aol.com
 To: Will Travis <travis@bcdcc.ca.gov>, Joe LaClair <joel@bcdcc.ca.gov>

MARGARET KEIUNEN ZEGART

118 HIGHLAND LANE
 MILL VALLEY, CA 94941 415-383-2.771

October 27, 2009

San Francisco Bay Conservation and Development Commissioners
 Will Travis, Executive Director
 Joseph La Clair, Chief Planner
 50 California Street, Suite 2600
 San Francisco, CA 94111

travis@bcdcc.ca.gov
joel@bcdcc.ca.gov

November 5, 2009
 Amendments "Proposed Additions to the Bay Plan Findings and Policy

Dear Commissioners.

Language should indicate that these climate change policies are applicable to all waters, estuaries of the San Francisco Bay, for example, that these policies and recommendations would be applicable to BCDC's *Richardson Bay Special Area Plan*.
 (My suggestions are underlined, using plain text for the staff recommended underline text. and staffs deleted words boxed.)

Because of intense political and economic development pressures, regional adaptation and regulatory planning is needed to underscore water detention holding areas, nonstructural barriers and increased and migratory natural shoreline protection.

FINDINGS

d " ... Shoreline areas that have subsided are especially vulnerable to sea level rise and may require protection more extensive structural shoreline protection, this shall precede new or redevelopment on existing risk sites."

L"Residents in some communities, particularly those with low incomes, disabilities, special needs populations and seniors lack the resources to respond effectively to the impact of sea level rise and storm activity. Planning to avoid future development on unprotected high-risk sites and means for F financial and other assistance is needed shall be provided to help these people be part of resilient shoreline communities.

P" ... that are vulnerable to inundation. Ideally a moratorium on new development on mapped climate change risk sites shall be requested by the Commissioners from the State Legislators. 5
This was done when the regulatory parameters of the San Francisco Bay and Development Commission were established..

Sincerely.

Margaret Kettunen Zegart

Ernest Pacheco, Citizens Against Pollution, October 19, 2009. Staff response below corresponds to Citizens Against Pollution's comment letter received on October 19, 2009.

1. Comment noted.
2. Comment noted.
3. Proposed climate change policy 1 requires a sea level rise risk assessment to be prepared when planning shoreline areas or designing larger shoreline projects. For areas currently in the Commission's jurisdiction, the Commission would require applicants to submit the risk assessment as part of their application for a permit or plan amendment, except for minor repairs of existing facilities or small projects that do not increase public safety risks. For areas outside the Commission's jurisdiction, this policy would be advisory to local governments and other agencies with permitting authority. Local agency staff will have opportunities to receive training in conducting and evaluating such risk assessments as part of the Commission's local government assistance program.
4. Please see response to comment number 3 of Margaret Kettunen Zegart. Also, proposed policy 7 states "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." Finally, proposed policy 6 calls for a regional strategy for addressing sea level rise impacts with considerable input from local governments.
5. Comment noted. See also response to comment number 4 above.
6. The Commission relies on its application form, which is adopted as a regulation by the Commission, for the information that it can require in a permit application. It is possible that the Commission's permit application will need to be revised after it adopts the proposed Bay Plan amendment regarding climate change. The Commission must follow a state-mandated rule making process before it adopts changes to its regulations, including its permit application requirements. The risk assessment required in proposed climate change policy 1 would likely contain much of the information requested in the "Sea Level Rise Inundation Area Survey" proposed in Citizens Against Pollution's letter.
7. Comment noted.
8. Proposed climate change policy 2, provides, in part, that "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 within existing urbanized areas that will be protected whether or not the infill takes place—should be designed to be resilient to a mid-century sea level rise projection based upon a risk assessment conducted for the project. 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 end-of-century sea level rise projection." In addition, proposed climate change policy 6(d) states that "redevelopment projects in areas vulnerable to future shoreline flooding should have a permanent financial strategy that will guarantee the general public will not be burdened with the cost of protecting the project from any sea level rise or storm damage in the future." These policies are intended to integrate risk management planning into shoreline development projects in low-lying areas with potential public safety risks.
9. Proposed climate change policy 4 encourages effective, innovative sea level rise adaptation approaches. And, as noted in response to comment 8, proposed policy 2 provides for integrating adaptive management and risk assessments in the design of projects to clarify the long-term viability of projects.
10. Please see responses to comments 3 and 6 above.
11. Comment noted.

October 19, 2009

Commissioner Sean Randolph,
San Francisco Bay Conservation
& Development Commission
50 California St., Suite 2600
San Francisco, CA 94111

RE: Proposed Bay Plan Climate Change Additions

Dear Commissioner Randolph,

Citizens Against Pollution (CAP) is a Hayward based grassroots environmental conservation / environmental justice non-profit which has advocated for the protection of the sensitive habitat of the Hayward shoreline since our founding in 2007. 1

CAP fully supports the Commission in its decision to amend the Bay Plan to include a Climate Change policy section and we appreciate this opportunity to comment on the proposed changes. The Commission has from its inception been a precedent setter in the formation of forward thinking public policy and this current effort continues that tradition. 2

We would like to proffer what we think may be a useful strategy to help in addressing the "gap" between the Commission's current area of limited authority and the much larger area that will be under the Commission's authority in the near future due to Sea Level Rise (SLR). It is our hope that this strategy will facilitate an immediate consideration by the Commission's sister agencies and the dozens of local permitting authorities as to whether a particular project that is under going permitting consideration, *in an area that is not now, but will be* in the Commission's area of authority would be in concordance with the proposed Climate Change Policies; 1 (a)(b)(d) and 2 (g)(h)(i): 3

1 (a) encourage new projects on the shoreline to be set back from the edge of the shore above a 100-year flood level that takes future sea level rise into account for the expected life of the project, or otherwise be specifically designed to tolerate sea level rise and storms and to minimize environmental impacts;

1 (b) discourage new projects that will require new structural shoreline protection during the expected life of the project, especially where no shoreline protection currently exists;

1 (d) require an assessment of risks from a 100-year flood that takes future sea level rise into account for the expected life of the project;

2 (g) support research that delivers useful information for planning and policy development on the impacts of climate change on the Bay, particularly those related to shoreline flooding;

2 (h) identify actions to prepare and implement the strategy, including any needed changes in law; and

1

2 (i) identify mechanisms to provide information, tools, and financial resources to local governments to assist them with climate change adaptation planning. The new policy provides guidance for developing and updating a regional strategy to adapt 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 planning that is necessary with a high degree of uncertainty, limited resources, and relatively rapid release of new scientific information.

3

As the Commission has already produced comprehensive Sea Level Rise maps that illustrate the predicted mid century and 2100 areas of inundation, and as the Commission's authority is expected to follow that changing shoreline, CAP believes it is appropriate for the Commission to work with the local permitting agencies to discourage inappropriate development not only in the area currently under BCDC's present authority, but also in the considerable area that will fall into BCDC's jurisdiction as the shoreline changes. The difficulty of playing "catch up" as the local authorities approve development in areas of future inundation without having clearly considered the various costs that will have to be incurred to address that projects future Sea Level Rise issues will in the aggregate we believe, be considerable. There is a need to facilitate, on a project by project basis; a conversation between the developer, the local permitting authorities and any other local agency that can reasonably be expected to have a major stake in that immediate areas future SLR adaptation plan. A failure to do this we believe may have the unfortunate consequence of "locking in" adaptation strategies in some areas that are less than optimal for the Bay ecosystem, environmental justice considerations, and indeed all of the many considerations for developing a regional plan.

4

Given that by mid-century there may be as much as 281 square miles of Bay land vulnerable to flooding and as much as 332 square miles by century end, the local permitting authorities must incorporate into their permitting process *this year* considerations of SLR in areas that are not yet within BCDC's jurisdiction. While the Commission cannot mandate permitting conditions in the areas that will be under your jurisdiction in 2025, 2050 etc. but are not presently, the Commission can immediately begin to address this gap and focus the attention of both the private developers of future inundation area projects and the local permitting authorities.

5

CAP feels that an effective method to support the Commission's ongoing efforts on just this matter would be for the Commission to distribute to the 60+ local agencies who have some authority in the predicted area of future inundation, a short "Sea Level Rise Inundation Area Survey" (see attached). This survey would be issued by the local permitting agency to the proposed project developer as part of that agency's standard permits package and the completed survey would be reviewed by the local agency with a copy sent to BCDC.

6

While the local permitting agency would still be free to issue permits to any and all projects it chooses to, CAP believes that the developer's answers to the Sea Level Rise Inundation Area Survey (SLRIAS) will be a great "focuser of attention" to the local authorities of the inevitable cost to the local authorities of addressing Sea Level Rise in the inundation area. 7

While predictions of tax revenues and other benefits to the local municipality are considered in many penning decisions, a real consideration of the monetary costs that will be accllled by that municipality in protecting/ removing/ replacing etc. that individual project in response to inevitable SLR rarely are. The proposed project developer's answers to the SLRIAS will allow that consideration to be included in every permitting decision if the local permitting agency chooses. 8

CAP believes that having the developer fill out the BCDC SLRIAS will also allow the developer to more clearly understand an important but currently unexamined factor in the long term viability of his proposed project. We hope this would result in a self editing process for some of the more inappropriate projects in the inundation area and conversely in facilitating innovative responses by the more responsible developers. 9

The data from SLRIAS would also be of use to the BCDC in the coming years as a way to identify trends in the way its 60+ partner authorities are addressing project development in the future inundation areas as well as trends in the developer communities understanding of SLR and their response. CAP recognizes the Commission has finite resources in manpower and monies with which to do its important work and would like to suggest that for the price of an electronic file, the Commission could store the completed surveys until such time as the Commission has the need to review the SLRIAS data, and the resources available. 10

Again, Citizens Against Pollution supports the Commissions decision to include a Climate Change policy component to the Bay Plan and thanks the Commission for this opportunity to comment. 11

Sincerely,
 Ernest Pacheco
 Citizens Against Pollution
 22650 Main St.
 Hayward, CA 94541
 Ph: (510) 677 8452
 Email: VacationPombo@aol.com

cc: Chief Planner
 Joe LaClaire

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION

50 California Street· Suite 2600· San Francisco, California 94111' (415) 352-3600' Fax: (415) 352-3606' www.bcdc.ca.gov

Sea Level Rise Inundation Area Survey New Construction! Significant Amendment

12

1. a. City/County Address: _____
 b. GPS Coordinates: _____
2. Project Description: _____

3. Estimated Life Time of Project: _____
4. a. Expected date of Commencement of Construction: _____
 b. Expected date of Completion of Construction: _____
5. Permitting Agencies: _____
6. What level of Inundation is predicted to occur on site at ;
 (use BCDC/ USGS maximum, minimum Sea level rise maps)
 - a. 2025: max. _____ min. _____
 - b. 2050: max. _____ min. _____
 - c. 2100: max. _____ min. _____
7. What strategy do you plan to use to deal with that level of Inundation;
 - a. 2025: _____
 - b. 2050: _____
 - c. 2100: _____
8. What is the predicted cost of implementing that strategy: _____
 (attach documentation)
9. Have you secured a bond in that amount to finance that strategy: _____
 (attach documentation)
10. Will there be ancillary costs that must be borne by the permitting agencies or any local land management agency, as a result of your chosen inundation strategy:
 - a. Yes No _____
 - b. Dollar amount: _____
11. Have you notified all affected agencies of the cost they must bear to implement your chosen inundation strategy for this project: _____
 (attach documentation)

David Lewis, Save the Bay, November 2, 2009. Staff response below corresponds to Save the Bay's comment letter received on November 2, 2009.

1. Comment noted.
2. The proposed climate change policy section, along with the changes to the safety of fills, and shoreline protection sections are intended to provide an interim framework for project review that addresses the potential risks to shoreline development and Bay resources. Proposed climate change policy 3 states that "[u]ndeveloped, 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."
3. The distinction between undeveloped and developed shoreline areas is made in the proposed climate change policies 3 and 6 and in shoreline protection policy 1.
4. The proposed policies do not explicitly discourage development in undeveloped areas vulnerable to sea level rise. Please also see response to comment 2.
5. The State of California's Climate Adaptation Strategy was not developed with stakeholder input, is not an official state policy and does not have the force of law. In developing this proposed Bay Plan amendment, the Commission staff has adapted the recommendations in the state strategy to be consistent with the Commission's laws and policies and to be appropriate to conditions in San Francisco Bay and on its shoreline.
6. Tidal marshes and tidal flats policy 1 states that, to the greatest extent feasible, the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored and increased. This policy is consistent with recommendation in the estuarine assessment conducted by the State Water Resources Control Board's Surface Water Ambient Monitoring Program (SWAMP). Also, as noted above in response 2, proposed policy 3 states, "[u]ndeveloped, 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."
7. The conclusions of the Commission's draft staff report, *Living with a Rising Bay*, cited in the comment are consistent with the proposed Bay Plan policies. Proposed tidal marshes and tidal flats policy 4 as amended would state that the public should make every effort to acquire restorable lands "for the purpose of habitat restoration and wetland migration." Proposed tidal marshes and tidal flats policy 6 calls for ecosystem restoration projects to include an appropriate buffer, where feasible, between shoreline development and habitats to protect wildlife and provide space for marsh migration as sea level rises. Proposed climate change policy 5 supports developing a regional strategy that includes protecting most existing shoreline development from flooding, maintaining sufficient transitional habitat and upland buffer areas around tidal wetlands, and incorporating natural Bay habitat for flood control and erosion prevention.
8. Comment noted.
9. Comment noted.
10. Please see response to comment 2 above.
11. Proposed climate change finding p. would define infill development as "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." Proposed climate change policy 6 states that, until a regional strategy is completed, new development should be limited to "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" and redevelopment that will remediate environmental degradation or contamination, if the redevelopment meets a range of safety, sustainability, and financial criteria.

12. In proposed climate change policy 6(e) that generally corresponds to policy 3(e) in staff's second preliminary recommendation on Bay Plan amendment 1-08, the phrase "in undeveloped areas" has been deleted and the policy has been revised to refer only to projects or uses that are interim or temporary in nature. See also response 2 above regarding development in undeveloped areas vulnerable to current or future flooding.

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SAN FRANCISCO BAY CONSERVATION
& DEVELOPMENT COMMISSION

saveSFbay.org

November 2, 2009

The Honorable R Sean Randolph, Chair
San Francisco Bay Conservation and Development Commission
50 California Street, Suite 2600
San Francisco, CA 94111

RE: Proposed San Francisco Bay Plan Amendment No. 1-08

Dear Mr. Chairman and Commissioners:

I am writing to provide additional input on the Commission's proposed Bay Plan Findings and Policies on Climate Change, and encourage important clarifying changes to the staff's October 1, revised draft. 1

Staff is now recommending Bay Plan Policies that provide interim guidance until a more comprehensive, regional sea level rise adaptation strategy can be completed. While regional planning proceeds, it is essential to preserve priority opportunities for adaptation and decrease risks to people, wildlife and infrastructure. 2

Save The Bay strongly recommends language changes to clearly distinguish between undeveloped shoreline areas at risk of inundation, and areas that are already developed and urbanized. 3

The Commission may consider authorizing development in already-developed areas if it meets certain criteria. But the Commission should change the draft policies to explicitly discourage development in undeveloped, vulnerable shoreline areas, for several reasons: 4

1. Doing so would be consistent with the approach outlined by the State of California in its draft Climate Adaptation Strategy, released in September. The coastal resources section of that document emphasizes that the top priority near-term action should be to "Establish State Policy to Avoid Future Hazards and Protect Critical Habitat." 5

2. Discouraging destruction of undeveloped, restorable shoreline would also be responsive to the State of California's most recent estuarine wetlands assessment. Since the Commission's last hearing on these policies earlier this summer, the State Water Resources Control Board's Surface Water Ambient Monitoring Program (SWAMP) project assessed the status of wetlands in California's estuaries. The assessment found that the conversion of estuaries to human land use has greatly decreased the extent



of salt marshes and associated habitat. This most comprehensive evaluation ever conducted on the overall health of any class of wetlands in California, found that San Francisco Bay contains 77 percent of all California salt marsh, and recommended:

Undertake protection of remaining habitat *and restoration to increase the size of estuarine wetlands* to reduce the effects of _____ terrestrial predators and other stressors.

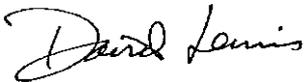
The Commission staff's report, *Living with a Rising Bay*, also underscored these imperative opportunities, and showed the Bay needs these key actions starting immediately:

- accelerating marsh restoration
- preserving opportunities for marsh migration upland and buffers
- increasing flood protection, using natural methods where possible, and
- reducing the infrastructure and people at risk from floods.

3. Applying this precautionary, "no regrets" approach to planning and development also would make the policies consistent with Finding (m), defining "infill development" as land already urbanized with infrastructure, and Finding (q) on sustainability.

Our specific recommended modifications to the staff's proposed findings and policies for the new Bay Plan Climate Change section are modest, important wording changes that would provide essential clarity to the Commission, staff, other jurisdictions and the public. We urge you to endorse these changes and thank you very much for your consideration.

Sincerely,



David Lewis
Executive Director

Enclosure

5

7

8

9

SAVE THE BAY - RECOMMENDED CHANGES TO OCTOBER 1, 2009 DRAFT

3. Until a regional sea level rise adaptation strategy can be completed, a precautionary approach should be used for planning and regulating new development in any area that is vulnerable to flooding. In undeveloped, vulnerable shoreline areas, the Commission should discourage development, and should encourage habitat preservation and restoration. **10**

In developed, vulnerable shoreline areas, including infill development of already urbanized areas where water sewer and other public services are in place, the Commission should ~~To~~ ensure that any new development allowed in these areas will be both resilient to sea level rise and storm surge and minimize adverse environmental effects. In these areas, any project larger than a minor repair of an existing facility except small projects that do not increase risks to public safety, whether within the Commission's jurisdiction or in a low-lying inland area under the jurisdiction of other agencies, should be limited to either: **11**

- a. infill development within existing urbanized areas
- b. natural resource restoration or enhancement projects
- c. development that (1) will provide significant regional benefits and meet regional goals by concentrating employment or housing near existing or planned transit service sufficient to serve the project, and (2) includes the following elements: (i) an adaptation strategy for dealing with rising sea level and storms with definitive goals and an adaptive management plan for addressing key uncertainties for the life of the project; (ii) measures that will achieve resilience and long-term environmental sustainability in all elements of the project; (iii) a permanent financial strategy that will guarantee the public will not be burdened with the cost of protecting the project from any sea level rise or storm damage in the future; and (iv) will not require Bay fill for structural shoreline protection at any time during the life of the project, especially where no shoreline protection currently exists; or
- d. development that is set back from the edge of the shore above the 100-year flood level that takes future sea level rise into account for the expected life of the project; or

e. in undeveloped areas, projects that will not require Bay fill for structural shoreline protection at any time during the life of the project, especially where no shoreline protection currently exists. **12**

Sam Schuchat, California State Coastal Conservancy, November 2, 2009. Staff response below corresponds to the Coastal Conservancy's comment letter received on November 2, 2009.

1. Comment noted.
2. The Commission supports the Coastal Conservancy's efforts to expand our experience with creating "living shorelines". The following proposed findings and policies are consistent with the proposal to monitor and evaluate the use of "living shorelines" to reduce shoreline erosion. Proposed climate change finding h. states that adaptive management, as well as testing and refinement, and will be needed to develop effective, innovative adaptation approaches. Proposed climate change policy 4 encourages effective, innovative sea level rise adaptation approaches. Proposed climate change finding j. defines adaptive management to include 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 Bay Plan's findings and policies concerning subtidal areas in the Bay address subtidal habitat restoration. For example, subtidal areas policy 3 states that subtidal restoration projects should be designed to benefit aquatic species, restore rare habitat types, establish linkages between habitat types, or expand open water areas. This policy does not address using subtidal habitat structures to slow wave energy and reduce shoreline erosion and this section of the Bay Plan is not proposed for revision as part of this amendment.
3. The phrase "some developed areas may be suitable for ecosystem restoration if existing development is removed to allow the Bay to migrate inland" is located in proposed climate change finding s. The issue of inadequate public funding to address the projected impacts of sea level rise is described in proposed climate change finding k.
4. Please see response to comment number 3 of Margaret Kettunen Zegart regarding development in current or future flood prone areas. Reducing flood risk associated with infill development in vulnerable areas is addressed in proposed climate change findings p. and r. and policies 1, 2, 5(g), and 6(c). Please also see response to comment number 11 of David Lewis from Save the Bay regarding infill development and response to comment 5 of Mr. Lewis' letter regarding the State Adaptation Strategy.
5. In proposed climate change policy 3, the phrase "permanently protected" has been added to indicate that areas identified for inland migration of Bay habitat as sea level rises may be protected by conservation easement or other means, in addition to acquisition. Support for acquisition of such areas is included in the proposed revision of tidal marshes and tidal flats policy 4, which now states that the public should make every effort to acquire restorable lands "for the purpose of habitat restoration and wetland migration."
6. In tidal marshes and tidal flats finding n., "goals" was changed to "targets" to be consistent with tidal marshes and tidal flats finding g. and policy 4 and to reflect the recognition that a new approach is needed in updating the Baylands Goals.
7. Comment noted.



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SAN FRANCISCO BAY CONSERVATION
& DEVELOPMENT COMMISSION

November 2, 2009

R. Sean Randolph, Chair
SF Bay Conservation and Development Commission
50 California Street, Suite 2600
San Francisco, CA 94111

RE: State Coastal Conservancy (Conservancy) comments on the Revised Preliminary Recommendation for Proposed Bay Plan Amendment 1-08 Concerning Climate Change

Dear Chairman Randolph,

The Conservancy has reviewed the revisions to the proposed Bay Plan Amendment 1-08 on climate change, tidal marsh and tidal flat, shoreline protection, safety of fill and public access, and we are writing to express our support for the Bay Plan Amendment. We appreciate the fact that many of our proposed revisions to your first draft have made it into the proposed amendments.

1

Specifically, we support the language added to Climate Finding g. on integrating adaptation and mitigation strategies and the need to expand the range adaptation strategies we may consider through "ilmovation, testing and refinement." To that end, the Conservancy is currently seeking funding to explore the use of "living shorelines" as a way to enhance subtidal habitats in the Bay while also protecting against flooding and shoreline erosion. Living Shoreline projects propose to use subtidal habitat structures such as oyster reefs or eelgrass beds placed in strategic, viable locations to slow wave energy off shore, thus reducing shoreline erosion. As with all projects, the envirommental impacts should be carefully evaluated and monitored throughout the testing phase to prevent or minimize any unforeseen negative envirolllental impacts that may result from these projects. We look forward to working with you on exploring other possible adaptation strategies to address sea level rise, storm surge and climate change that also achieve green house gas emissions reductions and/or habitat protection and ecosystem enhancement goals.

2

We are especially pleased to see the language added to Climate Change Finding i. that recognizes that: "[t]here may not be adequate public funding to protect all developed areas vulnerable to sea level rise and storm surge, and some developed areas may be suitable for ecosystem restoration if existing development is removed and the Bay is allowed to migrate inland." We believe removal of development in vulnerable, flood prone areas is a necessary consideration for any viable adaptation strategy for the Bay region.

3

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Oakland, California 94612-2512
510'286'1015 Fax: 510-286-0470

We also find improvement **in** adding Climate Finding m, and Climate Policy 3; both of these provisions recognize the need to take a risk-adverse, precautionary approach to development in the face of sea level rise and storm surge. We realize that some vulnerable areas with development may need to be protected and new infill development considered because that development may meet regional transportation, housing, job needs for the region and/or have significant economic, cultural or social value, Carefully considered infill development may be appropriate **in** some areas and these projects should be scrutinized to evaluate all the potential benefits and cost, hazards, and environmental implications, We believe this approach is also consistent with the State's Adaptation Strategy, currently **in** draft form,

4

The addition of Climate Policy 4 is especially important for the Conservancy, We have a strong interest **in** protecting existing shoreline areas that sustain diverse habitats and offer opportunities to restore wetland ecosystem habitats and functions. As an agency, we look forward to working with you and other stakeholders to identify these areas and build partnerships to protect existing shoreline habitats that will allow for Bay habitat migration and provided adaptive capacity against shoreline erosion and flooding.

5

Finally, we appreciate the language changes made that recognize the need to allow for landward migration of wetlands where possible in Tidal Marshes and Tidal Flats finding k., and also the language changes made with respect to setting new "regional ecosystem targets" for tidal marsh/flat conservation, restoration, and management versus relying solely on the Baylands Ecosystem Habitat Goals report in Finding g, and Policy 4. We suggest that you might also consider modifying the phrase ". future updates to these goals" **in** Finding n, to reflect the regional ecosystem target approach as described **in** Finding g, and Policy 4,

6

Again, thank you for responding to the Conservancy's initial concerns and incorporating many of our suggestions. We look forward to working with you to develop a regional adaptation strategy for the Bay region that will help us prepare for sea level rise and climate change while protecting the habitats, natural resources, and ecological functions that the Bay provides,

7

Sincerely,

Sam Schuchat

Executive Officer, CA State Coastal Conservancy

Jim McGrath, November 3, 2009. Staff response below corresponds to Mr. McGrath's comment letter received on November 3, 2009.

1. Comment noted.
2. Proposed tidal marshes and tidal flats finding 1. states that sediment supply to the Bay is declining and that an adequate supply of sediment is necessary to ensure resilience of the Bay ecosystem as sea level rise accelerates.
3. Comment noted.
4. In proposed climate change policy 5(b), which describes the regional strategy's goal of enhancing the Bay ecosystem, "managing" has been changed to "assuring" adequate volumes of sediment for marsh accretion.
5. Proposed climate change finding f. states in part that "Understanding vulnerabilities to climate change is essential for assessing climate change risks to a project, the Bay or 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." Proposed climate change policy 2, states in part that "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 within existing urbanized areas that will be protected whether or not the infill takes place—should be designed to be resilient to a mid-century sea level rise projection based upon a risk assessment conducted for the project. 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 end-of-century sea level rise projection." The Federal Emergency Management Program (FEMA) is conducting a new coastal study of San Francisco Bay that will result in updated flood insurance rate maps. The new base flood elevations will incorporate storm surge and the effects of waves, including wave setup, wave run-up and overtopping, and overland wave propagation. For additional information, please see www.r9coastal.org.
6. Please see response to comment 2.
7. Comment noted.
8. The Commission is working closely with FEMA and other agencies responsible for flood protection to ensure that flood risk maps are updated regularly to reflect the best available data and risk assessment methodologies. In addition, proposed climate change policy 1 states that "[w]hen planning shoreline areas or designing larger shoreline projects, a risk assessment should be prepared, based on the estimated 100-year flood elevations that take future sea level rise 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 available, should be used in the risk assessment."
9. The phrase "and storm surge" has not been add to shoreline protection policy 1 because the 100-year flood in coastal hazard zones is defined as including storm surge. The importance of storm surge in causing shoreline flooding is noted in climate change finding d., safety of fills finding f.
10. The proposed change was not made because impacts of sea level rise on the sediment processes in streams feeding the Bay has not been fully analyzed, due to insufficient information describing the potential impacts.
11. The proposed change was not made because the potential impacts of sea level rise adaptation on sediment transport have not been analyzed, due to insufficient information describing the potential impacts.
12. Please see response to comment 4.

From: Jim McGrath <macmcgrath@comcast.net>
Date: Tue, 3 Nov 2009 01:02:34 +0000 (UTe)
To: Joe LaClair <joel@bccdc.ca.gov>
Subject: Climate Change report

Joe--here are my thoughts, well organized with supporting citations 1
and the changes that I would like to see.

CONCERNS FOR REVISED CLIMATE CHANGE BAY PLAN AMENDMENT

1. The Bay will need **more** sediment to keep up with accelerated sea 2
level rise, and the best information we have suggests that sediment
generation is going down, not up.

2. Sea level rise, with all other factors held constant, will flatten the 3
energy slope of the water surface of tributaries carrying sediment, and
will therefore tend to move the depositional areas for sediment further 3
upstream and away from the Bay. For the relatively flat streams coming
into the Bay, a 16 inch increase in still water level is an immense change.

3. Given these two factors, we should recommend that climate 4
action responses in the watersheds leading to the Bay should carefully
analyze the impacts of their proposed actions on sediment transport to
the Bay, and mitigate any significant impacts. This would entail modest 4
changes to provision 2(b), page 10, by calling for "maintaining existing
sources of sediment" instead of managing sediment. This
recommendation will be useful to the Regional Board, which has more
authority over watersheds.

4. Since economic factors, including public subsidy for flood 5



insurance and public perception of risk, affect the question of whether some areas should be protected as sea level rises, the estimates of risk should be as accurate as possible. Thus, the flood mapping effort should reflect both surge and sea level rise. I am willing to being convinced that FEMA's new regulations for flood plain and shoreline mapping will accomplish this, but I haven't seen it yet.

SUPPORTING INFORMATION-WHERE'S THE SCIENCE?

The most current source for my viewpoint remains the 2009 Pulse of the Estuary, subtitled "Bay Sediments: Past a Tipping Point." However, I have studied sediment transport since the late 1970's. See for example "Sea level rise will also increase sediment demand.", page 74. I also note the last comment on that page, that a paradigm shift is needed etc.; that is precisely what I am talking about here. See also figure 2, page 59, which shows the dramatic decrease in suspended sediment levels. The article on Sea Level Rise in Shore and Beach, Fall 2009, sent to the Commission also provides ample support. It notes, on page 47, the "diminishing sediment supply", increases in erosion of intertidal areas, and the diminishing supply of Central Valley sediment due to trapping behind dams and reduced transport capacity. It notes quite specifically "Higher rates of sea-level rise and declines in sediment inflow could initiate erosion of tidal and subtidal habitats...", "citing Jaffe, one of a number of renowned USGS scientists working on sediment in the Bay.

I haven't looked for a specific citation for higher sea level slowing water and depositing sediment. But it is fundamental to the physics of all of the sediment transport equations; gravity is the force that transports water and sediment and a flatter slope means less transport. Most of the scientists haven't thought transport through that far, they're still working on models. But David Schoellhamer can readily confirm this for you; we talked about it at the RMP annual meeting.

The article "Before the Flood" included in the last Commission mailing supports my concerns about inaccurate mapping in effect encouraging development in areas subject to under-estimated risk. Mitch Avalon, the deputy Public Works Director for Alameda County, spoke at a seminar at UC Berkeley this year where he said that Pinole Creek, using the current Corps of Engineers approved methodologies for "100 year protection" actually provides less than 1 in thirty year protection. Before sea level rise, or surge, are taken into account.

RECOMMENDED CHANGES

1. Change Shoreline Protection Policy 1, page 14, by adding the phrase "and storm surge" after sea level rise. 9
2. Change Tidal Marshes and Tidal Flats finding l., page 20, to add the phrase "higher sea level in many of the flat streams that currently provide sediment to the Bay may slow runoff and decrease sediment supply." 10
3. Change Tidal Marshes and Tidal Flats finding m. to add as a second sentence: "Some of the sea level adaptation approaches could further decrease transport of sediment to the Bay." 11
4. Change Climate Change Policy 2.b. page 10, to strike the words "manage adequate volumes of sediment" to "preserve the downstream transport of sediment needed for marshes and mudflats and mitigate any significant impacts on sediment transport." 12

Jim

Curry Eckelhoff, Tamalpais Planning Area Bayfront Coalition, November 4, 2009. Staff response below corresponds to the Tamalpais Planning Area Bayfront Coalition's comment letter received on November 4, 2009.

1. Please see response to comment number 3 of Margaret Kettunen Zegart regarding development in current or future flood prone areas. Please see response to comment 8 of Citizens Against Pollution regarding the requirement of a permanent financial strategy for redevelopment in vulnerable areas.
2. Please see response to comment number 2 of Margaret Kettunen Zegart regarding the use of natural shoreline habitat in nonstructural shoreline protection projects.
3. Please see response to comment number 5 of Margaret Kettunen Zegart regarding the Commission's stance on seeking interim authority over vulnerable low-lying areas.
4. Please see response to comment number 5 of Friends of the Estuary regarding the types of projects to be allowed in areas vulnerable to current or future shoreline flooding.

From: Curry Eckelhoff <forcurry@comcast.net>
Reply-To: Curry Eckelhoff <forcurry@comcast.net>
Date: Wed, 4 Nov 2009 12:53:48 -0800
To: Will Travis <travis@bcdcc.ca.gov>, Joe LaClair <joel@bcdcc.ca.gov>
Subject: Fw: November 5, 2009 meeting ...

November 4, 2009

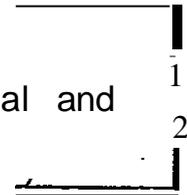
Will Travis, Executive Director
BCDC Commissioners
Joel La Clair, Chief Planner
Bay Conservation and Development Commission
50 California St. Suite 2600
San Francisco, CA 94111

Dear Commissioners,

At your meeting of November 5, 2009 please adopt your staff's most supportive, original language, reflecting the maximum possible restrictions allowing BCDC policy on new and future development to prohibit development along public access that is now or shall be inundated in 2025, 2050 or 2100 AD by rising sea level (RSL). These parcels in the mapped vulnerable bayland corridors of over 60 regional jurisdiction and non flooding CALTRANS and other agencies' circulation jurisdictions require future adaptation and protection by **bonded financial plans for future mitigation**, provided by each project applicant. Funding to cover damage resulting from seismic hazards, lateral mud displacement and infrastructure settlement issues of new development on bay fill or mitigation and inundation protection by structural barriers shall be a part of the 60+ regional agencies permitting procedure.

Natural shoreline with habitat enhancement as the 100 year Flood level migrates inland shall become the viable alternative to dikes, barriers and

elevated structures without 24 hour safe access for commercial and residential development.



As done in 1965 BCDC Commissioners SHOULD REQUEST FROM CALIFORNIA GOVERNANCE A MORATORIUM ON BUILDING PERMITS FOR THE SAN FRANCISCO BAY AND ITS ESTUARIES. This would allow an interim or approved draft policy for increased BCDC's relevant regulatory jurisdiction and appropriate local and regional measures. BCDC leadership regarding climate change impacts for the 60+ regional agencies has already been legislated.

3

Add language to provide no structures within the current allowed setback or 100 feet shoreline band, and in an area that is not now or shall be in the Commission's area of authority in Climate Change Policies: 1.

4

Sincerely,

Members of the Tamalpais Planning Area Bayfront Coalition

Curry Eckelhoff- President, Tamalpais Valley Improvement Club
forcurry@comcast.net

Kelt Zegart- Almonte resident
kettz@aol.com

Linda Johnson- Tamalpais Valley resident
Lfjohnson1@comcast.net

Linda Rames- Almonte resident
lrames@firstmarin.com

Ralph Nobles, Friends of Redwood City, November 5, 2009. Staff response below corresponds to the Friends of Redwood City's comment letter received on November 4, 2009.

1. Comment noted.
2. Comment noted.
3. Please see response to comment number 3 of Margaret Kettunen Zegart regarding development in current or future flood prone areas. Please also see responses to David Lewis' comments 2 and 11 above.
4. The proposed policies do not prohibit or discourage development in low-lying areas vulnerable to sea level rise. The example Redwood Shores general improvement district example provided is instructive regarding the necessity of ensuring the long-term viability of any funding strategy intended to meet the ongoing costs of adapting existing or new development in areas vulnerable to shoreline flooding. The proposed policy would require the long-term viability of such a strategy.
5. Comment noted.
6. Please see response to comment number 5 of Margaret Kettunen Zegart regarding the Commission's stance on seeking interim authority over vulnerable low-lying areas both inside and outside of its current jurisdictional boundaries.



November 5, 2009

Bay Conservation and Development Commission
50 California Street, Suite 2600
San Francisco, CA 94111

RE: Proposed Bay Plan Amendment 1-08 Concerning Climate Change

Dear Chairman Randolph and Commission Members:

Friends of Redwood City would like to thank the Commission for taking into consideration our June 2009 comments on the Draft *Staff Report and Preliminary Recommendation for Proposed Bay Plan Amendment 1-08 Concerning Climate Change*. We appreciated the staff responses to our comments and the incorporation of suggestions into the Climate Change policies. We would like to take this opportunity to provide additional comments on the *Revised Preliminary Recommendation for Proposed Bay Plan Amendment 1-08* issued on October 1, 2009. 1

The additions and revisions to the findings and policies in the proposed Bay Plan Amendment provide valuable clarification and strengthen the effectiveness of the proposed amendment to address the possible impacts to the Bay ecosystem and bayside communities from climate change. We would like to submit the following comments for your consideration. 2

1. Climate Change Policy 3c (1) allows for new development in areas vulnerable to flooding if it will "provide significant regional benefits and meet regional goals by concentrating employment or housing near existing or planned transit service sufficient to serve the project".

Public safety, an over-arching goal outlined in Policy 2a, should support "significant regional benefits". Public safety dictates that new communities shouldn't be placed in low-lying areas vulnerable to sea level rise. True "smart growth" near transit does not require putting new development in a FEMA flood plain. The recently published map "Grow Smart Bay Area" created by Green Belt Alliance shows numerous locations on the Peninsula for high density housing along existing transit corridors. The areas shown on this map for additional housing in Redwood City do not include building on salt ponds, where extensive fill and construction of new levees would be required. 3

2. Climate Change Policy 3c (iii) states that new development must provide "a permanent financial strategy that will guarantee the public will not be burdened with the cost of protecting the project from any sea level rise or storm damage in the future".

As you are aware, Redwood City has a significant number of bayfront residential neighborhoods and businesses behind shoreline levees. Approximately five miles of perimeter levees protecting the Redwood Shores Peninsula now must be raised and certified to comply with FEMA flood protection requirements. In 1964, the City of Redwood City formed a General Improvement District (GID) to collect funds from Redwood Shores developers to cover all the costs of 4

infrastructure projects, including levees. As it turns out, the remaining OID funds may be inadequate for this additional levee improvement project. The City Council recently appropriated city Capital Improvement Funds to back up the project if needed.

Although the citizens of Redwood City realize the importance of protecting our existing communities, residents are understandably leery of assuming additional financial liability for future levee improvements associated with new development in unprotected areas vulnerable to flooding from sea level rise. As is evident from the levee improvement project in Redwood Shores, there is no "permanent" or "guaranteed" financial strategy that can address all the future flooding hazards to a bayfill development from the effects of climate change. For this reason, the best "precautionary approach" would be to disallow development in areas vulnerable to sea level rise, particularly if these areas are suitable for Bay wetland restoration.

The recent documentary *Saving the Bay* described the 1960's when every city had its bayfront garbage dump; every city had its fill-in-the-bay real estate dreams. Fortunately, our legislators had the vision to create BCDC in order to quickly provide regional expertise, oversight and regulation for the Bay.

Today we urge the Commission to seek immediate interim permitting authority, through legislation, over areas vulnerable to sea level rise rather than waiting for the "regional sea level rise adaptive strategy" to be completed. Developing a regional strategy could take years. In the meantime, cities will continue to make individual short-sighted land use decisions that will further tax the Bay Area's ability to address the impacts from climate change on our existing communities and the Bay ecosystem.

Thank you very much for considering our comments.

Respectfully yours,



Ralph Nobles, Founding Member
Friends of Redwood City

Ellen Joslin Johnck, Bay Planning Coalition, and Jim Wunderman, Bay Area Council, November 4, 2009. Staff response below corresponds to the Bay Planning Coalition and the Bay Area Council's comment letter received on November 4, 2009.

1. Comment noted.
2. Comment noted.
3. Proposed climate change policy 5 states that the Commission will work with other agencies and the general public to develop a regional sea level rise adaptation strategy. The term "general public" should be taken to include the private sector. Please see response to comment number 5 of Margaret Kettunen Zegart regarding the Commission's stance on the appropriate order of undertaking this Bay Plan amendment and developing a regional strategy.
4. Comment noted.
5. Proposed policy 7 provides that where jurisdictions or policies overlap, the Commission should coordinate with other agencies in the review of projects. Please also see response to comment 3 above. Finally, proposed climate change policy 5 provides that "[t]he 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."
6. The Commission is participating in or tracking all the studies mentioned. Some of them, such as the State Adaptation Strategy have been completed. These studies do not constitute an impediment for the Commission updating the Bay Plan findings and policies under its current authority as defined in the McAtteer-Petris Act.
7. Please see response to comment 3.
8. Please see response to comment 6. The staff has not recommended a policy of discouraging development in low-lying areas as proposed in the State Adaptation Strategy.
9. Climate change policy 1 states, "When planning shoreline areas or designing larger shoreline projects, a risk assessment should be prepared, based on the estimated 100-year flood elevations that take future sea level rise into account. A range of sea level rise projections for mid-century and end of century, including at least one high estimate that are based on the best science-based projections currently available should be used in the risk assessment." Climate change finding c. states, "Using IPCC greenhouse gas emissions scenarios, in 2010, 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." The finding notes that these are currently "the best science-based sea level rise projections available for California, and that, as new information on climate change becomes available and factors that have regional effects on sea level rise are better understood, future sea level rise projections are likely to change."
10. Please see responses to comments 3, 5 and 9. Also, proposed climate change finding k provides in part that "[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." Also, proposed climate change finding 2, states, in part that "[i]f 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 end-of-century sea level rise projection."
11. Comment noted.

12. Proposed climate change finding c. relies upon ranges rather than single numbers for mid-century and end-of-century sea level rise projections. Proposed climate change policy 3 provides that “[w]hen planning shoreline areas or designing larger shoreline projects, a risk assessment should be prepared, based on the estimated 100-year flood elevations that take future sea level rise 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 available, should be used in the risk assessment.” The analysis of areas vulnerable to sea level rise in the Commission’s draft climate change background report, *Living with a Rising Bay*, does not take into account existing shoreline protection because adequate information was not available on levee heights or strength. This and other limitations in the use of the data are discussed on page 24 of the report.
13. The commenter appears to characterize the projections of 16 inches of sea level rise by mid-century and 55 inches of sea level rise by end of century as worst-case scenarios. Many of the climate model outputs and related sea level rise projections are close to the 16-inch, mid-century projection. As noted above in response to comment 12, the staff’s preliminary recommendation climate change finding c. states, “Using IPCC greenhouse gas emissions scenarios, in 2010, 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.” The finding notes that these are currently “the best science-based sea level rise projections available for California,” and that, as new information on climate change becomes available and factors that have regional effects on sea level rise are better understood, future sea level rise projections are likely to change. Proposed climate change finding c. further states, “melting of the Greenland and Antarctic ice sheets is not currently well reflected in sea level rise projections.” Therefore, the ranges provided are not worst-case scenarios.
14. The example provided recommends a sea level rise projection that falls within the range given in proposed climate change finding c., and proposed climate change policies 1 and 2.
15. Section 66632(b) of the McAteer-Petris Act provides, in part, that “[t]he commission shall establish reasonable requirements to assure that sufficient information is provided by permit applicants to allow the commission to act on the applications.” This provision of the law provides sufficient authority for the Commission to require reasonable risk assessments as part of its application requirements. Please also see response to comment 3 of Citizen’s Against Pollution.
16. Please see response to comment 3.
17. The McAteer-Petris Act empowers the Commission to “issue or deny permits, after public hearings, for any proposed project that involves placing fill, extracting materials or making a substantial change in use of any water, land or structure within the area of the Commission’s jurisdiction.” The law includes several policy sections, which empower the Commission, and limit its authority. The limitations on projects described in proposed climate change policy 6 (prior policy 3 in staff’s second preliminary recommendation) are consistent with the law.
18. The Commission can condition shoreline protection projects, based on the existing criteria, and the proposed amendment would include additional criteria. Establishing all of these criteria is within the Commission’s existing statutory authority. Guidance for interpreting the phrase “taking sea level rise into account” is found in climate change finding c., which provides a range of sea level rise projections for mid-century and the end of the century.
19. Comment noted.
20. The California State Coastal Conservancy has expressed interest in supporting a project to update regional ecosystem targets. The project would likely involve the participation of a variety of scientists and stakeholders from the public and private sectors. The staff recommends that the Commission support such an undertaking.

21. The last sentence of public access policy 6 has been revised to state, "Any public access provided as a condition of development should either be required to remain viable in the event of future sea level rise or flooding, or equivalent access consistent with the project should be provided nearby." In general, the staff believes that public access that is subject to periodic flooding would still be considered viable if the flooding does not permanently damage the public access, require it be closed for unreasonably long periods of time, or present public safety risks. The Commission would interpret the policy through its permit decisions.
22. The proposed findings and policies do not restrict flood protection districts from carrying out their maintenance responsibilities. Proposed safety of fills policy 4 states, "The Commission may approve fill that is needed to provide flood protection for existing projects." Proposed climate change policy 6(a) allows for minor repairs of existing facilities. Proposed climate change policy 2 includes a "kick out" provision that states that "projects—other than minor repairs of existing facilities, small projects that do not increase risks to public safety, interim projects and infill projects within existing urbanized areas that will be protected whether or not the infill takes place" would not have to prepare risk assessments for permitting.



November 4, 2009

Dr. Sean Randolph, Chairman and Commissioners
S. F. Bay Conservation and Development Commission
50 California Street
San Francisco, CA 94111

Attention: Will Travis, Executive Director

Subject: Draft Staff Report and Revised Preliminary Recommendation for Proposed Bay Plan Amendment
1-08 Concerning Climate Change: Nov. 5 Public Hearing

Dear Dr. Randolph,

The Bay Planning Coalition and the Bay Area Council are submitting this letter jointly to provide general comments on the timing and process of the above-subject. Also we have some specific comments on the language of some of the Bay Plan amendments which are contained in an Appendix at the end of this letter. We appreciate BCDC's initiative, research and efforts to engage the public in discussion about rising sea levels (SLR) as a result of climate change and global warming.

As responsible businesses, landowners and local governments, we, and many of our individual members, are giving great attention to climate change issues as the implications are substantial. There is ongoing engagement with engineers, scientists and planners to review base flood levels and SLR scenarios and identify feasible adaptation strategies and investment options.

We agree that a deliberate SLR evaluation and guidelines' process focused on vulnerabilities and flood risk aversion strategies must be carried out. Due to the complexity and high degree of scientific uncertainty regarding future levels of a rising sea, it is necessary to proceed with caution and with a very inclusive private-public sector approach. We will ask the Governor to work with us, the state Climate Change Adaptation Strategy Group, the U. S. Army Corps of Engineers, FEMA, BCDC, local flood control managers and others to assist in establishing an inclusive approach. We believe the new policy and regulatory framework, such as being proposed by BCDC through Bay Plan amendments, is premature. Moreover, the following points must be considered:

1. There are multiple local, state and federal jurisdictions involved in adaptation planning, land use decisionmaking and permitting. Substantial authority for land use, and therefore, economic decisionmaking, resides at the local government level.
2. Climate change as it affects sea level rise requires engineering as well as a scientific analysis. This is a national and statewide issue of concern and requires a coordinated approach among stakeholders and local, state and federal agencies with expertise and practical experience.
3. There are ongoing evaluation and adaptation planning studies, both local and statewide, which need to come to fruition and be incorporated into decisionmaking.
 - a. The California Climate Change Adaptation Strategy recently published a series of recommendations which require certain tasks to be accomplished by December, 2010. The State of California has asked the National Academy of Sciences to advise on the State strategy including appropriate baseline values for sea level rise.
 - b. The Federal Emergency Management Authority (FEMA) is remapping the Bay shoreline working with local flood control districts, the Bay Area Flood Managers Group.
 - c. The U. S. Army Corps of Engineers is conducting the South Bay Shoreline Study to identify appropriate risk aversion strategies and levee improvements in the south Bay. The USACE recently published an Engineering Circular containing guidance on incorporating sea-level change in civil works programs (CECW-CE Circular No. 1165-2-211, July 1, 2009)
 - d. The State Lands Commission is conducting a survey on its state-granted, leased lands.
 - e. The Bay ports and airports are conducting protected structures' evaluations.

Conclusion

The Commission should not adopt the Bay Plan amendments at this time. The members of the Bay Planning Coalition and the Bay Area Council will be pleased to work with the Governor's office, the involved federal, state and local agencies and BCDC to establish an inclusive process for building consensus on decisionmaking. 7

The State of California's Climate Adaptation Strategy investigations should be completed, including the State Lands Commission survey through 2010. The engineering analysis and adaptation planning work of the local flood control districts, major landowners such as the ports and airports and ongoing sub-regional planning processes such as the U. S. Army Corps of Engineers' South Bay Salt Pond Shoreline Study should continue and serve as forums for collective discussion and future recommendations. 8

Information from these studies should enable the application of the best scientific professional judgment on a site-specific basis, along with full consideration of local prerogatives on determining the economic feasibility of certain strategies. Ample opportunity should be afforded for all to identify and agree upon baseline values for sea level rise and adaptation strategies and options. 9

We agree that the development of guidelines based on appropriate evaluations of future SLR could contribute to sustainable maintenance and development along the affected Bay Area shoreline. However, such guidelines must be developed in light of limited financial resources available to government entities as well as affected stakeholders. We propose that any guidelines should be crafted along these criteria: They should 10

- be compatible with and not redundant of existing jurisdictions; avoid imposing additional impediments to permit review and approval, include a scheme of specifications that is calibrated to realistic risks of infrastructure life-cycles,
- facilitate permit applications that meet agreed-upon targets, and
- incorporate adaptive management principles that will enable periodic review of SLR assumptions and revision of guidelines as appropriate. 11

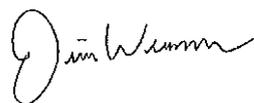
We believe that this type of inclusive and integrated approach to developing guidelines can be embraced by all of the region's stakeholders.

The landowners, businesses and local government members of BPC and BAC look forward to working with you to identify appropriate roles and strategies for the future effective governance of San Francisco Bay related to climate change.

Sincerely yours,



Ellen Joslin Johnck
Executive Director
Bay Planning Coalition



Jim Wunderman
President and CEO
Bay Area Council

Cc: Colonel Rock Donahue, Commander, South Pacific Division, U. S. Army Corps of Engineers
LTC Laurence Farrell, District Engineer, San Francisco District, U. S. Army Corps of Engineers
Bruce Wolfe, Executive Officer, S. F. Bay Regional Water Quality Board
Sam Schuchat, Executive Director, California State Coastal Conservancy
Henry Gardner, Executive Director, Association of Bay Area Governments (ABAG)
Mendel Stewart, Refuge Manager, S. F. Bay National Wildlife Refuge Complex
Alexis Strauss, Director, Water Division, U. S. EPA Region IX
Dick Butler, Area Office Supervisor, NOAA Fisheries, Santa Rosa
Susan Moore, California Field Supervisor, U. S. Fish and Wildlife Service
Becky Ota, Senior Supervisor, Northern California, Ca. Dept. of Fish and Game
Woodrow Goins, Director, Federal Emergency Management Authority, Region IX
Steve Heminger, Executive Director, Metropolitan Transportation Commission
Mitch Avalon, Bay Area Flood Managers Group
Jack Broadbent, Air Pollution Control Officer, Bay Area Air Quality Management District (BAAQMD)

Appendix

I. Examples of concern with the Climate Change Findings

Climate Change Finding c.:

We are concerned that BCDC is relying on two numbers (a sea level rise increase of 16 inches by mid-century and 55 inches by 2100) on which to base its projections of vulnerability and development of adaptation strategies. Also it is not clear whether BCDC has considered existing shoreline protection in its estimate of shoreline infrastructure vulnerability in future sea level rise. 12

These sea level rise values represent an overly prescriptive approach for worst-case scenarios rather than a more rational "middle of the road" expected outcome. Given the uncertainty of future sea level rise, rather, the emphasis should be on incremental steps. Rational and adaptive management strategies to fit specific local circumstances are needed given the wide temporal and spatial variability at shoreline locations around the Bay. Important distinctions should be made between eustatic sea level rise, i.e. the global average value, versus local sea level rise which can greatly differ due to local variation. 13

An example of a sound base level analysis and recommended site specific management strategy is described in documents prepared by Moffatt & Nichol, an international coastal engineering firm, for both the Treasure Island Community Development Project, in July, 2008 and also Hunter's Point. Part 1 "Planning for Sea Level Rise" contains a detailed analysis of estimates of sea level rise in the recent scientific and planning literature and outlines a development planning strategy for Treasure Island. and we quote two of the nine conclusions from the reports as follows: 14

- *"Rising sea levels is an ongoing phenomenon, and needs to be accounted for in the planning process. Estimates of SLR over the next 100 years range from an observed value of 8-inches (historical measurements), to 33-inches (IPEe maximum). Empirical methods put forth by Rahmstorf (2007) suggest a maximum allowance of 55-inches, which is what the eALFED Independent Science Board recommends as a high, but plausible, value.*
- *Development grades, as well as shoreline improvements, should take into account the effects of SLR to prevent the project from being mapped as a flood plain in the future. An allowance of 3 feet for finish floor elevations of buildings plus a freeboard of 6 inches is recommended, which would ensure that the structures are above even the high estimates of SLR. In addition, the shoreline and public access improvements should be designed to allow future increases in elevation to keep up with higher SLR values, should they occur".*

II. Examples of concern with some of the Policy Amendments (Climate Change section)

Policy #1: This new policy "When planning the shoreline, designing a shoreline project or regulating a proposed project along the shoreline, a risk assessment should be prepared based on the 100-year flood level..." This goes beyond BCDC's authority to mandate such an action. 15

Policy #2: This new policy specifies that BCDC will develop a regional climate change adaptation strategy with the Joint Policy Committee and include "identification of areas where development should be protected, those areas where development should eventually be removed and those areas where the Bay should be allowed to migrate inland..." A regional strategy should be informed by an expanded and inclusive process including local, state and federal evaluations described earlier, in this letter. 16

Policy #3: This new policy prescribes the conditions limiting what types of development should be authorized in low-lying areas. It is not within BCDC's authority to prescribe allowable development other than what is specified in the McAteer-Petris Act. 17

III. Examples of concern with some of the Policy Amendments (Shoreline Protection section)

Policy #1: This modified policy specifies that new shoreline protection projects should be authorized only if a certain number of conditions exist, e.g. the project is properly engineered... to take future sea level rise into account and constructed to prevent significant impediments to public access... This reads as if BCDC may disallow a shoreline improvement project for flood protection if it does not comply with these criteria. 18

The technical basis for these criteria is not clear about "taking future sea level rise into account", and the condition is beyond BCDC's authority. **18**

Policy #5: This new policy mandates that "adverse impacts to natural resources and public access should be avoided. Where significant impacts cannot be avoided, mitigation or alternative public access should be provided." This is vague. **19**

IV. Example of concern with some of the Policy Amendments (Tidal Marshes and Tidal Flats)

Policy #4: New ecosystem targets should be updated periodically. By whom? **20**

V. Example of concern with Finding(s) Amendments (Public Access)

Finding 6. "Any public access provided as a condition of development should be required to remain viable in the event of future sea level rise or flooding". This is not realistic depending on how the term "viable" is to be interpreted. **21**

Overall, we are concerned about the general direction of the findings and policies that upon reading them would restrict local flood protection districts from carrying out their maintenance responsibilities. **22**

Comments from the November 5, 2009 Public Hearing	
Public Comment	Staff Response
<p>Gwenythe Scove, Friends of Redwood City. 1. Ms. Scove made comments identical to those in Friends of Redwood City's November 5, 2009 letter.</p>	<p>1. Please see responses to comments in the Friends of Redwood City letter of November 5, 2009.</p>
<p>David Lewis, Save the Bay. 1. Mr. Lewis made comments consistent with those in Save the Bay's letters of November 2, 2009 and May 7, 2009. 2. He noted that Save the Bay has previously suggested that the Commission take an ambitious and bold approach, including adopting a policy that would request interim permitting authority over proposed new development in undeveloped shoreline areas at risk of inundation, and the current staff draft is not going in that direction. 3. He encouraged the Commission to seek additional authority and to address climate change in other parts of the Bay Plan, not just the sections that were noticed. 4. He said that the Commission's interim policy guidance until there is a regional strategy should follow a precautionary approach as much as possible. 4. He suggested changing Policy 3 to limit development in vulnerable areas to areas that already have development, or infill areas, that are defined as places that already have infrastructure that can support development. 5. He said that if you develop in undeveloped areas, that precludes the possibility of recognizing that they should be preserved empty or restored, and it presumes that you already know the outcome of a regional strategy that would encourage you to preserve or restore certain areas. 6. He said that if BCDC is going to encourage things outside its jurisdiction, it should also discourage things outside its jurisdiction.</p>	<p>1. Please see responses to comments in Mr. Lewis' Save the Bay letters of November 2, 2009 and May 7, 2009. 2. Please see response to comment number 5 of Margaret Kettunen Zegart regarding the Commission's stance on seeking interim authority over vulnerable low-lying areas. 3. The staff recommended and the Commission concurred that amending additional sections of the Bay Plan was unnecessary because the proposed climate change policy section would apply within all of the Commission's jurisdictions. 4. Please response to comment 4 in Save the Bay's letter of November 2, 2009. 5. Please response to comment 2 in Save the Bay's letter of November 2, 2009. 6. Please see response to comment 3 in Citizens Against Pollution's letter of October 19, 2009.</p>
<p>Andrew Michael, Bay Area Council. 1. Mr. Michael made comments consistent with those in Bay Planning Coalition and the Bay Area Council's November 4, 2009 letter. 2. Mr. Michael congratulated the Commission for its leadership in advancing the public discussion on sea level rise and climate change and stated the intent of the Bay Area Council (BAC) to keep working with the Commission on this issue. 3. He said BAC doesn't think the Commission should adopt the amendment now because new sea level rise projections will be coming out soon that should be incorporated into the discussion about where development should and should not occur. 4. He said BAC would like to see a process for the development of the regional plan that includes all</p>	<p>1. Please see responses to comments in the Bay Planning Coalition and Bay Area Council's letter of November 4, 2009. 2. Comment noted. 3. Please see response to comment 9 in BPC and BAC's letter. 4. Please see response to comment 3 in BPC and BAC's letter. 5. Please see response to comment 5 in BPC and BAC's letter.</p>

Comments from the November 5, 2009 Public Hearing	
Public Comment	Staff Response
the private sector developers, as well as local, regional, state and federal government agencies that have land use authority, in order to achieve a plan of certainty rather than an interim plan. 5. He said BAC wants a process that is not redundant of permitting authority but relies on existing operations and expands authority when needed.	
Ellen Johnck, Bay Planning Coalition. 1. Ms. Johnck made comments consistent with those in the Bay Planning Coalition and the Bay Area Council's November 4, 2009 letter. 2. She stated that more work is needed, and the Bay Planning Coalition (BPC) recommends a more inclusive approach, including flood control managers, local districts, airports, business and industry around the Bay. Entities that are already regulating and are responsible for developing adaptation strategies and risk aversion, such as the Army Corps and FEMA, should be included. 3. She said a regional strategy is good, but the guidelines in the strategy should aid the flood control districts and should not be redundant. 4. She said BCDC should be facilitating permit applications, not imposing additional permit requirements that may be more burdens and obstacles than solutions.	1. Please see responses to comments in the Bay Planning Coalition and Bay Area Council's letter of November 4, 2009. 2. Please see responses to comments 3 and 5 in BPC and BAC's letter. 3. Please see responses to comments 5 and 22 in BPC and BAC's letter. 4. Please see response to comment 5 in BPC and BAC's letter.
Henry Hilken, Bay Area Air Quality Management District. 1. Mr. Hilken said he supports using the Joint Policy Committee to coordinate the development of a regional adaptation strategy. He noted that much work is going on at the local level but that regional leadership is necessary. 2. He urged adoption of the amendments.	1. Proposed climate change policy 5 states that the Commission, in collaboration with the Joint Policy Commission, will work with other agencies and the general public to develop a regional sea level rise adaptation strategy. 2. Comment noted.