Citizens Committee to Complete the Refuge

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20 July 2021

Re: Comments Regarding the Draft Environmental Impact Report (DEIR) (SCH# 2020090519) for Plan Bay Area 2050 (proposed Plan)

Dear Metropolitan Transit Commission Commissioners and Staff,

The Citizens Committee to Complete the Refuge appreciates the opportunity to provide comments regarding the Draft Environmental Impact Report (DEIR) for Plan Bay Area 2050 (PBA 2050). CCCR applauds elements of the Draft Plan Bay Area that recognize societal inequities and supports strategies that focus on resolving economic, transportation and quality of life challenges that face large segments of Bay Area residents. However, based upon our review of the DEIR and that of our California Environmental Quality Act (CEQA) consultant, Richard Grassetti, we have identified substantive concerns that should be resolved before an EIR for PBA 2050 is approved.

The Citizens Committee to Complete the Refuge (CCCR) has a long-standing interest in the protection, restoration, and acquisition of San Francisco Bay wetlands; as such the focus of our comments is on biological resources and in particular on the interface of Plan Bay Area 2050 with lands along the edges of San Francisco Bay.

CCCR was originally formed in 1965 by a group of citizens who became alarmed at the degradation of the Bay and its wetlands. We joined together, and with the support of Congressman Don Edwards, requested that Congress establish a national wildlife refuge. The process took seven long years and in 1972 legislation was passed to form the San Francisco Bay National Wildlife Refuge, the first national wildlife refuge in an urban area. Recognizing that crucial habitats of the Bay were still at risk we turned to Mr. Edwards again, and in 1988 (the first year he submitted it) his legislation to double the size of the Refuge was signed into law. Our membership is approximately 2,000 people and we have the support of 40 local and national organizations--including open space advocates, hunters and environmental groups.

Plan Bay Area 2050

CCCR takes an active interest in the protection of the baylands of San Francisco Bay, the health and biodiversity of its ecosystems, protection of the Bay's watersheds, and public education regarding the value of these resources. The focus of our comments center on the Bay's biological resource issues. Despite the ecological and societal benefits they impart, these habitats and ecosystems were only hinted at in the preceding Horizon and Blueprint documents.

We appreciate that the 2050 Plan Bay Area incorporates an "Environment Element", but we are disappointed to see that rather than actively incorporating protection of the ecological environment into PBA 2050, most of the strategies encompassed under the heading "environment" pertain to human health and risk reduction. Those goals are certainly important, however, San Francisco Bay lies at the heart of our region and maintaining its ecological health and vitality are crucial concerns that should be duly considered and interwoven into any regional vision and plan.

Plan Bay Area 2050 emphasizes that the four core areas – housing, transportation, economy and environment – are inextricably linked. Looking at an issue such as sea level rise, one can see how sea level rise can have a cascade effect that not only impacts mobility throughout the Bay Area, the communities where we live and the Bay Area's economy, it also has significant and adverse environmental ramifications for natural resources such as tidal marshes and the Bay's diverse ecosystems – adverse ramifications that will be seriously exacerbated if siting of housing, work places, transit, recreational facilities, etc. do not take into consideration the need for tidal marshes to be able to migrate upslope as sea level rises. Protection of baylands is crucial to the health and vitality of San Francisco Bay, yet the significance of losing these vital habitats is barely discussed PBA 2050. PBA 2050 fails to adequately consider how existing and planned transportation and development projects will exacerbate the impacts of sea level rise impacts on biological resources, particularly where development or infrastructure restricts the ability of baylands to migrate upslope.

Plan Bay Area 2050 must recognize that the San Francisco Bay Estuary is not just of State importance, but is of hemispheric importance and that this vitally important ecosystem is at risk from the combined effects of shoreline encroachment into former baylands and sea level rise.

The San Francisco Bay Conservation and Development Commission (BCDC) provides the following description of the San Francisco Bay Estuary on their website[1]:

> The mixture of salt and fresh water is the foundation of the Bay's biological diversity and richness. The San Francisco Bay is the largest estuary on the west coast. It includes unparalleled marshes and mudflats along the shoreline that provide food and shelter to fish and wildlife and account for 77% of California's remaining perennial estuarine wetlands. It is home to over 1,000 species of animals, including endemic, threatened, and endangered species. It is a critical stopover for hundreds of thousands of birds on the Pacific Flyway and hosts more wintering shorebirds than any other estuary on the west coast outside of Alaska. The Bay supports over 130 species of fish, including salmon and other anadromous fish, which spend most of their lives in the ocean but return to fresh water to reproduce. Harbor seals, gulls, sea bass, geese, thousands of other species of fish, plants, mammals,

[1] San Francisco Bay Conservation and Development Commission. "*San Francisco Bay and Estuary*." https://bcdc.ca.gov/bay_estuary.html

reptiles, and birds thrive in the San Francisco Bay estuary. Indeed, its diversity of key habitats and production of environmental benefits such as flood protection, water quality maintenance, nutrient filtration and cycling, and carbon sequestration compelled the international community to designate San Francisco Bay in late 2012 as a "Wetland of International Importance..."

...With unparalleled recreational opportunities and beautiful scenery, San Francisco Bay is one of the world's greatest tourist destinations. Its stunning beauty and its contributions to such a high quality of life help make the Bay Area one of the country's most desirable places in which to live. The consistent temperature of the Bay water cools the surrounding region in the summer and warms it in the winter, making the Bay area climate among the world's most enjoyable. The Bay is inextricably woven into each resident's sense of place, culture, and community; it is a dynamic and interconnected system whose value is crucial to the region's environmental, economic, and social prosperity. While most of the people who live in the Bay Area may not see the Bay on a daily basis, their knowledge that it continues to thrive is evident by the support that BCDC enjoys.

And the 2015 Baylands Ecosystem Habitat Goals Update[2] (BEHGU) summarizes the grim future the Bay Area faces if we do not prioritize protection of these essential habitats:

"Projections show that if we don't act, rising seas and greater erosion will cause the baylands to shrink. We would lose the protection these wetlands provide to our shoreline by buffering storm waves, and the cost-effectiveness of a natural infrastructure that adjusts as sea levels rise. The bay would fundamentally change, with hardened edges and little vegetation.

Eventually, this damage would be irreversible. The region would be obliged to construct and maintain more sea walls and levees, and larger ones. (In places where wetlands are not naturally sustainable, other forms of sea level rise adaptation will be required in any case.) The baylands would eventually retract to narrow strips at the base of these structures or disappear altogether. Water quality could degrade as the baylands would no longer absorb excess nutrients from wastewater or filter contaminants. The diversity and abundance of native animals and plants would be drastically reduced. Several endangered species found only in San Francisco Bay could go extinct, and millions of migratory waterbirds would lose critical feeding and wintering grounds."

With the loss of tidal wetlands, we lose their tremendous ability to sequester carbon – to draw carbon down from the atmosphere and store it. Protection of ecosystems capable of drawing down and storing large quantities of carbon is an outcome that should be in complete alignment with the Greenhouse Gas Emission goals of PBA 2050.

Rising sea levels, in conjunction with how we develop next to the edges of the Bay and the resilience measures we choose to employ, will have a profound impact on the future of the Bay's tidal wetlands ecosystems, therefore, we urge MTC/ABAG to make the following changes to Environmental Strategy 1 and 5:

Strategy EN-1: Adapt to sea level rise. Protect shoreline communities affected by sea level rise, prioritizing low-cost, high-benefit solutions and providing additional support to vulnerable populations. *Protect vulnerable habitats and ecosystems that are threatened by sea level rise. The use of nature-based solutions (NBS) should be prioritized over that of grey infrastructure. Require a county approved plan for sea-level rise adaptation that is detailed, coordinated with other locales, and funded,*

[2] Goals Project. 2015. *The Baylands and Climate Change: What We Can Do. Baylands Ecosystem Habitat Goals Science Update 2015* prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. California State Coastal Conservancy, Oakland, CA .

*before building within the FEMA 100-year flood zone***.**

Strategy EN5. *Preserve the Bay Area natural environment, biodiversity and ecosystem function.* Provide strategic matching funds to help conserve and maintain high-priority natural and agricultural lands, including but not limited to Priority Conservation Areas and wildland-urban interface areas. *Provide adequate buffers between developed areas and wildlands and implement climate smart techniques for working landscapes. Provide adequate space for migration of tidal wetlands utilizing tools such as the San Francisco Bay Shoreline Adaptation Atlas[3], the San Francisco Bay Ecosystem Habitat Goals Update, U.S. Fish and Wildlife Service Tidal Marsh Ecosystem Recovery Plan and other available studies to identify appropriate sites for such migration. Support habitat conservation planning, track habitat losses and gains, and monitor habitat quality and ecosystem health. Scientific data and input should be the basis for identifying Priority Conservation Areas rather than relying on a consensus-based process.*

Plan Bay Area 2050 and its DEIR do not adequately consider potential sea level rise scenarios.

One of the most catastrophic threats to existing communities, infrastructure and ecosystems of the Bay Area is climate change. Unlike earthquakes, the threat of climate change related issues such as sea level rise, can be anticipated and to some degree, avoided or mitigated.

The PBA 2050 and particularly the DEIR appear to rely upon an estimate of 2' of sea level rise by 2100 to determine the extent of impacts to housing, development and infrastructure which are intended to be long-lived assets. The planning assumption of sea level rise (SLR) is arbitrary and seems inconsistent with state policies that ought to guide the development of Plan Bay Area 2050. Furthermore, the DEIR uses the one SLR assumption and does not portray the magnitude of effects if there is a larger rate of SLR.

In September 2020 (revised October 2020), MTC and ABAG released a document entitled, "*Plan Bay Area 2050 and Sea Level Rise Adaptation: How is MTC/ABAG integrating this critical issue into the next-generation regional plan?"* The document identifies "Adapt to Sea Level Rise" as one of the key environmental strategies that will be integrated to "ensure the region recognizes and addresses future shoreline flooding challenges." There are sea level rise exposures proposed for 2' of sea level rise by 2050 and 3' of sea level rise to account for annual storm and king tide events. The 3' of sea level rise is assumed to "determine where proactive adaptation actions were most needed to inform the financial need for future adaptation." Why isn't this document referenced in the PBA 2050 DEIR? Please clarify the sea level rise exposure that has been utilized in identifying potential impacts in the DEIR, is it 2' or 3' by 2100? Does the calculation of inundation risk also include storm surge or king tide elevations?

In early 2020, a document developed by State and regional agencies was released by the California Ocean Protection Council (OPC), "*Making California's Coast Resilient to Sea-Level Rise: Principles for Aligned State Action.*" One of the guiding principles identified is "Ensure California's coast is resilient to at least 3.5 feet of sea-level-rise by 2050..." The background section of this document states, "California's coast faces a significant risk of experiencing SLR up to 1.0 feet by 2030 and 7.6 feet by 2100." Based upon the guidance for the thirty-year planning window proposed for Plan Bay Area 2050, we recommend 3.5' of sea level rise be utilized to

[3] SFEI and SPUR. 2019. *San Francisco Bay Shoreline Adaptation Atlas: Working with Nature to Plan for Sea Level Rise Using Operational Landscape Units.* Publication #915, San Francisco Estuary Institute, Richmond, CA.

assess financial need for future adaptation for existing development and infrastructure, and for development that can be constructed in a manner that can be resilient to greater sea level rise or can be relocated.

For proposed new or retrofitted transportation projects, we urge MTC/ABAG to evaluate and plan for resilience to 7.6' by 2100 as recommended by the OPC guidance document. Additional factors such as, ground subsidence, low elevations of roadways and infrastructure, and paving of watershed lands, mean that flooding will come from upland areas as well as from the Bay, resulting in increased flood risk. It should be expected that for major roadway projects, rail projects, BART, etc. due to the costs in time and money of implementing these projects, and the disruption and financial burdens that would result should transit projects require relocation, that major infrastructure and transportation projects would have an expected service life of greater than 30 years.

Sea level rise perturbations indicate that one should plan for high tide flood risk appearing sooner than expected. The OPC guidelines based on scientific projections of low, medium and high sea level rise are generally regarded as somewhat smooth increases. On top of those possible trend lines there are perturbations that may exacerbate and accelerate the occurrence of extreme flooding. Recently[4], scientists reported on projected increases in US high-tide flooding (HTF) including the impact of the 18.6-year lunar nodal cycle on tidal amplitude. The authors conclude; "The mid-2030s, in particular, may see the onset of rapid increases in the frequency of HTF in multiple US coastal regions. We also show how annual cycles and sea-level anomalies lead to extreme seasons or months during which many days of HTF cluster together. Clustering can lead to critical frequencies of HTF occurring during monthly or seasonal periods one to two decades prior to being expected on an annual basis."

The DEIR should not just evaluate the impacts of sea level rise on Priority Development Areas (PDAs), Priority Production Areas (PPAs), transit and recreational facilities, but also of the impacts of the proposed PBA 2050 on the Bay's aquatic resources themselves, such as the ability of tidal marshes to move upslope. The DEIR has failed to assess whether elements of the Plan such as PDAs, PPAs, etc. restrict the ability of tidal marshes to migrate upslope, thus exacerbating the reasonably foreseeable impacts of rising sea levels.

Growth Inducing Elements of Plan Bay Area 2050

Plan Bay Area 2050 contains at least two projects and classifications that are alarming for those concerned about adverse impacts to tidal wetland habitat and adverse impacts to the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge).

[4] Thompson, Philip R., Matthew J. Widlansky, Benjamin D. Hamlington, Mark A. Merrifield, John J. Marra, Gary T. Mitchum, and William Sweet. "Rapid increases and extreme months in projections of United States high-tide flooding." Nature Climate Change (2021): 1-7.

Transit Rich Area and Transit Priority Area Designations Associated with a Potential Ferry in Redwood City

The first area of concern is the designation of a location across Redwood Creek from the Bair Island Unit of Refuge as a "Transit Rich Area" and also a Transit Priority Area. What are the implications for such designations? If for example, Transit Oriented Development would be a foreseeable outcome of a TRA or TPA designation, this would be extremely concerning. The general area indicated on Figure 2-5: Growth Geography Designations by Type is in an area that is vulnerable to inundation as sea levels rise.

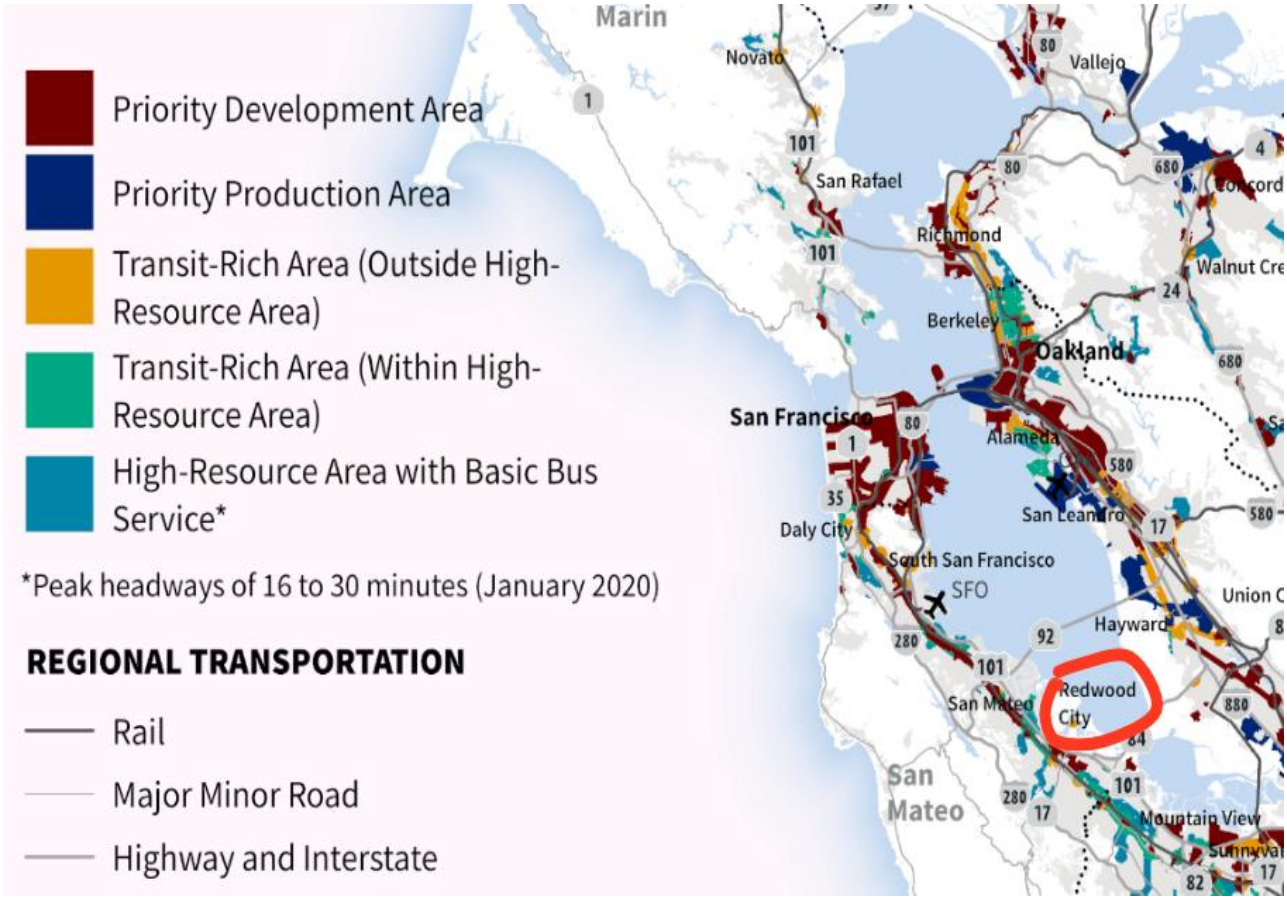
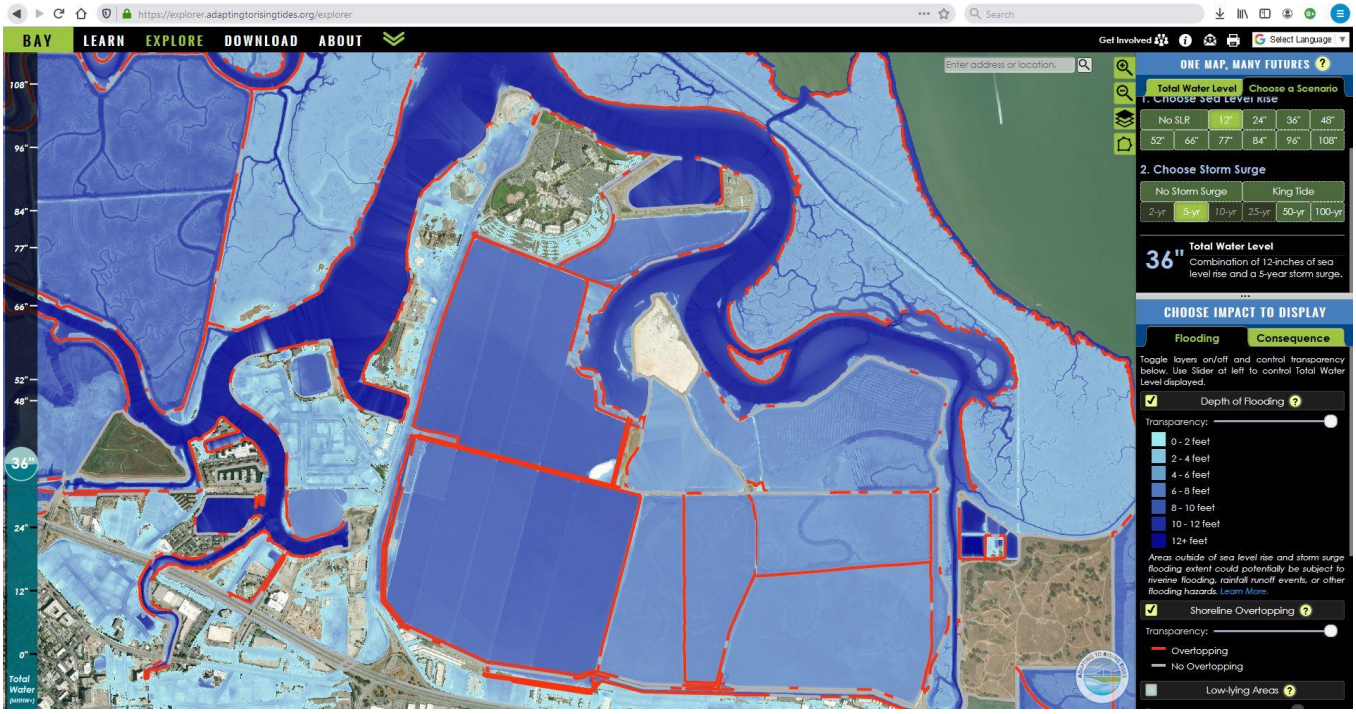


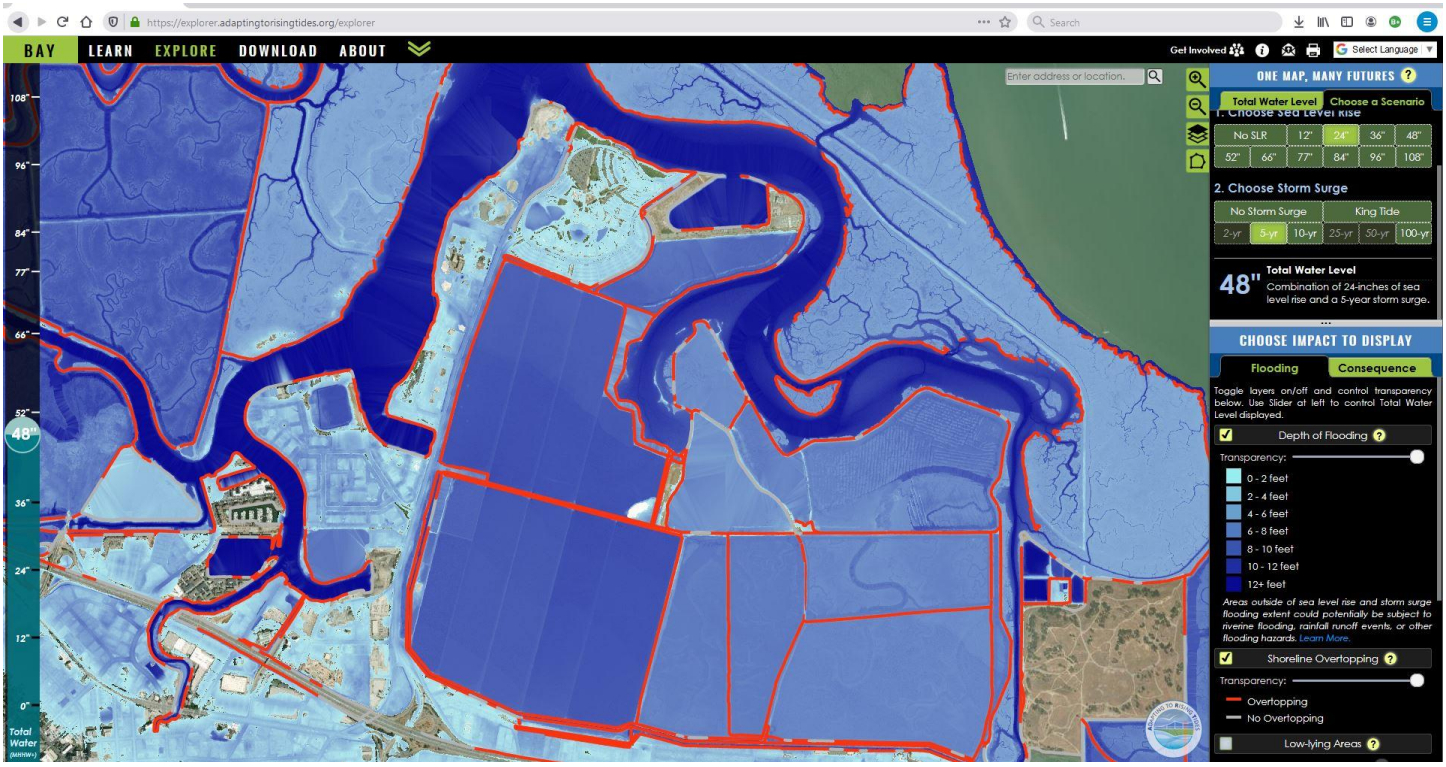
Figure 2-5: Growth Geography Designations by Type from the Plan Bay Area 2050 DEIR cropped and zoomed in to Redwood City

The following figures that have been downloaded from BCDC's *Adapting to Rising Tides Flood Explorer Map* demonstrate how vulnerable this area is to sea level rise inundation.



The figure above depicts the area under 12" of sea level rise and a 5-year storm surge for a total water level of 36". You can see the majority of the area would be inundated and major access roads flooded.

The figure below depicts the area under 24" of sea level rise, the level utilized in the DEIR, but with a 5-year storm surge for a total water level of 48". Almost the entire area, and areas east of Highway 101 are inundated under these conditions.



In addition to vulnerability to sea level rise, the location is adjacent to the Port of Redwood City. The Port of Redwood Commissioners have stated[5] that "incompatible residential developments were not appropriate" and that "the Port would not support incompatible land uses." Lastly, the area is directly across from the Don Edwards San Francisco Bay National Wildlife tidal marsh habitat of Greco Island and near the Refuge's Bair Island, both of which support the endangered Ridgway's Rail and numerous other rare species as well as harbor seal haul-outs.

While it is possible ferry service and/or a ferry terminal may ultimately be approved in this area, despite its vulnerability to sea level rise, PBA 2050, should not promote or encourage housing or development to be associated with potential ferry service at this location. Promoting TOD in the immediate area of the ferry terminal would be extremely growth–inducing and would increase pressure for sprawl onto nearby City-designated Open Space lands at the Cargill salt ponds. In response to inquiries from CCCR members, we were told it was "too late to remove the location from the maps." Clearly this is something that is not difficult to do and must be done before the Plan and the DEIR are finalized. This site also appears on Figure 2-6: *Growth Geography Designations and TPAs* and must be removed from that figure as well.

Furthermore, the DEIR must discuss how it addresses the potential environmental impacts of identifying TRAs and TPAs. Clearly, a site that seems appropriate for a TRA might also result in unavoidable impacts to significant environmentally rich habitats. The DEIR must recognize that not all sites that may qualify as TRA or TPA are appropriate for that designation due to overarching environmental impacts. The PBA 2050 should provide guidelines that enable decision-makers to consider these factors.

Dumbarton Rail

We recognize that proposed re-establishment of rail service along the Dumbarton Rail Corridor has been in and out of the regional rail plan for several decades and that an Environmental Impact Report/Environmental Impact Statement will be required to study the impacts of the rail project on the environment. However, we would like to emphasize that the alignment of the defunct rail line runs through an intact historic tidal wetlands complex that is of

A portion of the alignment of the defunct Dumbarton Rail line on the east side of the Bay runs through historic tidal marsh habitat. Photo courtesy of Cris Benton.

[5] Board of Port Commissioners. Port of Redwood City Minutes, December 9, 2020. 521530_05329d944ee446b7badf700036e9f4e6.pdf (filesusr.com)

regional importance and through the Refuge. These tidal wetlands support the endangered salt marsh harvest mouse and Ridgway's Rail and other rare species.

Google Earth Image of Newark Slough and wetlands surrounding the derelict Dumbarton Rail line.

The direct and indirect impacts of construction, operational and maintenance (including human disturbance factors) on this vitally important tidal wetland complex will need to be thoroughly identified, minimized and mitigated if the Dumbarton Rail plan ever comes to fruition. In addition, any planning process and ultimate project design should seize the opportunity to improve, not adversely impact, the function of this wetland complex and its resilience to future sea level rise. One example would be elevating the tracks through the tidal wetlands habitat to improve hydrological and biological connectivity.

DEIR Comments:

High-priority natural lands and Priority Conservation Areas:

p. 2-3 - Project Object #6 states:

> "Conserve the region's natural resources, open space, clean water, and clean air with the intent of improving health of Bay Area residents and workers and improving the health of the environment locally and globally."

And the Project Description: p. 2-9 of the DEIR states:

> "The proposed Plan's 9 environmental strategies promote conservation, adaptation, and climate mitigation. Strategies that fall under the three themes of reducing risks from hazards, expanding access

to parks and open space, and reducing climate emissions are crucial to ensuring that the Bay Area is environmentally—and equitably—thriving in 2050."

However, as noted earlier, the focus of the "Environment Element" of PBA 2050 is almost entirely a focus on risk and hazard reduction for residents of the Bay Area. Neither the Plan itself or the DEIR describe how the "region's natural resources" would actually be conserved.

The Final Blueprint document includes a tentative cost of $15 billion dollars to "Protect and Manage High-Value Conservation Lands. Provide strategic matching funds to help conserve and maintain high-priority natural and agricultural lands, including but not limited to Priority Conservation Areas and wildland-urban interface (WUI) lands." Yet, as far as we can determine, no information has been provided that describes the criteria that would be utilized to identify "high-priority" natural lands, how these lands would be managed, or how PBA 2050 would measure the success of this objective. The DEIR should discuss how "high-priority natural lands" will be identified. What criteria would be used to determine if sites are "high-priority" natural lands? Without access to this information, it is not possible to determine whether this objective can or would be met. Undeveloped sites along the edges of the Bay that could support tidal marsh migration should be considered "high-priority natural lands."

On a positive note, we do appreciate that "conservation" as described, is not limited to Priority Conservation Areas. The March 2020 final report for *Adapting to Rising Tides Bay Regional Sea Level Rise Vulnerability and Adaptation Study*, recognized the limitations of PCAs in the following Key Takeaway:

> "PCAs only contribute to a portion of the recreation, ecosystem services, and agricultural uses in the Bay Area. Lands within the Bay Area Protected Areas Database and natural lands outside of PCAs that do not have any protected status offer more recreation than PCAs, more groundwater recharge and peak flow retention that PCAs, and more brown pelican, depressional wetlands, heron & egret habitat, lagoon, native oyster, pinniped, playa, Ridgway's rail, rocky intertidal, sandy gravel beaches, southern sea otter, transition zone, tidal flat, tidal marsh, and vernal pool habitat than PCAs."[emphasis added]

The report further states under a discussion of "Limitations" of PCAs that:

> "...because PCAs are locally nominated by jurisdictions, they also represent places that local jurisdictions are willing to forego development. This may not always overlap with the areas within these cities or counties that are most important for conservation, restoration, or preservation." [emphasis added]

It is crucial if we are to ensure the long-term sustainability of the Bay's ecosystems and biodiversity that Plan Bay Area 2050 and other regional plans look beyond the political constructs of PCAs when determining lands that are worthy of protection. As we have stated previously, identification of PCAs and "high priority natural and agricultural lands" must be science based and not driven by political consensus.

Sea level rise adaptation infrastructure archetypes:

The section of the DEIR that describes "adaptation infrastructure" should be revised to include missing information. As an example, the DEIR includes Figure 2-3: *Sea Level Rise Adaptation Infrastructure Archetypes* depicting different locations where archetypes such as seawalls, levees, tidal gates, elevated roadways and marsh restoration might be utilized. While we totally encourage and support the use of marsh restoration and elevated roadways as adaptation infrastructure archetypes, seawalls and traditional levees have significant

adverse environmental impacts and should only be employed when nature-based alternatives are not possible. What is the origin of the information depicted on the figure? Were the mapped adaptation infrastructure archetypes obtained from other documents, agencies, or planning efforts?

According to "*Plan Bay Area 2050 and Sea Level Rise Adaptation: How is MTC/ABAG integrating this critical issue into the next-generation regional plan?*":

> "When choosing an archetype adaptation for a segment of impacted shoreline staff used various methods. If staff was aware of a current, well-defined strategy, then it was associated with that archetype category – for example, the SFO airport seawall is represented as a type of seawall. Where no current strategy existed, staff consulted a series of resources, including the Adaptation Atlas, EcoAtlas, the CHARG Sea Level Rise Resiliency Map, and subject matter expert guidance. In some cases, high level regional assumptions were made, particularly when the suggestion did not fit an archetype, or if there was no suggestion from consulted resources. In the case where there was no suggestion, natural solutions, such as marsh restoration and ecotone levees, were assumed wherever possible."

Is this the basis for the information presented in Figure 2-3? If so, this should be clarified in the DEIR.

We recommend that PBA 2050 and the DEIR should provide the following guidance:

- The use of nature-based solutions should be prioritized over the use of traditional grey infrastructure, excepting those situations where there is no nature serving alternative.
- Sea level rise strategies are site specific, that one type of sea level rise infrastructure or response is not appropriate in all situations, and that this has been discussed in detail in the Adaptation Atlas.
- There are additional nature-based solutions that have not been identified in the DEIR, but are described in the Adaptation Atlas.

The 2020 sea level rise document stated:

> "The specifics of adaptation measures are strictly intended to be model and estimated financial inputs for the regional plan, and are not suggestions for local planning in either their specific location nor depiction. These potential adaptation measures are not placed on a list for funding."

If this is still true, then this should be clearly stated in the DEIR.

Page 2.17-18 Use of elevated roads and rails to allow marsh migration and water circulation

Our next comment circles back to the need to clarify the development of Figure 2.3 which seems to suggest that MTC has decided not to elevate Highway 37 in an area where a causeway will be of great benefit. [It could also represent a lack of clarity in Map 5.1 from the Draft Plan that combined together widely different archetypes into a single designation on the map - elevated roadway, levees, seawalls, tidal gates.] In terms of currently active projects, perhaps the most important place for a causeway is Highway 37, where there is space available for natural upslope migration and water circulation to occur. The DEIR needs to address this topic in detail.

It is important to note where causeways or raised rail lines will offer greatest benefit for marsh upslope migration, this ties back to the failure of the DEIR to consider important indirect impacts of its proposed strategies. PBA 2050 and the DEIR should, within the Environment Element and Strategies, encourage the use adaptation infrastructure archetypes that prioritize preservation or restoration of ecosystem connectivity and

habitat migration pathways, such as the use of elevated transportation corridors (causeway) as opposed to raising berms. Ecosystem and societal benefits should factor into consideration of project costs.

5.1 of the Draft Plan depicts Elevated Roads/Rail, Ecotone and Traditional Levees, Seawalls and Tidal Gates. As suggested above, use of these archetypes are very different and should be depicted separately as in Figure 2-3 of the DEIR and it is difficult to distinguish road and rail lines. Also, it would be better if the Plan included an appendix with OLU level maps and more specific coding in the legend and map. Map 5.1 gives a bare taste of what is ahead because of its limited time frame and SLR assumption as noted on the map:

> Plan Bay Area 2050 considers an assumed 2 feet of sea level rise by the year 2050. Adaptation measures and areas protected or not protected are shown as modeling assumptions only. Potential areas for managed retreat and additional marsh restoration not shown. Specific adaptation interventions will be planned and implemented at the local level by the appropriate authorities in accordance with state and federal environmental review guidelines, and may include additional adaptation solutions. Areas of protection will vary based on the adaptation measure used and future site conditions.

If the DEIR uses OPC guidance towards a higher SLR by 2100, the DEIR will have a more sober and likely scenario during the life of these structures.

3.5 Biological Resources:

Generalized locations of tidal wetlands should be provided in the DEIR and references to regional science-based guidance documents should be provided as well:

We appreciate the mapping of critical habitat that is provided in the DEIR (Figures 3.5.1-3.5.4). We request that mapping of tidal wetlands habitat be included in the DEIR as well. As was discussed earlier in this letter, preservation and the long-term sustainability of tidal wetlands is crucial to maintaining the health of the Bay and for providing functions that benefit the residents of the Bay Area. Mapping of this habitat already exists in numerous documents including the Tidal Marsh Ecosystem Recovery Plan[6], the 2015 Bay Ecosystem Habitat Goals Update[7] and the Adaptation Atlas. Direct and indirect impacts of proposed growth geographies, infrastructure, transportation, and shoreline protection projects on tidal wetlands should be assessed, avoided and minimized. This can only be accomplished if the general locations of tidal wetlands with respect to the various growth geographies, PDAs, PPAs, PTAs, etc. are provided.

Indirect impacts have not been assessed:

One of the substantive concerns that has been expressed by our consultant Richard Grassetti, is the failure of the DEIR to assess the indirect impacts of PBA 2050 on the environment. This is certainly true for the section on Biological Resources. We have previously mentioned the adverse impacts development, transportation, recreation and sea level rise adaptation projects can have on the ability of tidal wetlands to migrate inland as sea level rises, exacerbating and resulting in the drowning of wetlands. Seawalls and traditional levees can result in erosion of adjacent habitats. Development and recreational areas adjacent to wildlife habitats can

[6] U.S. Fish and Wildlife Service. 2013. Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California. Sacramento, California. xviii + 605 pp.

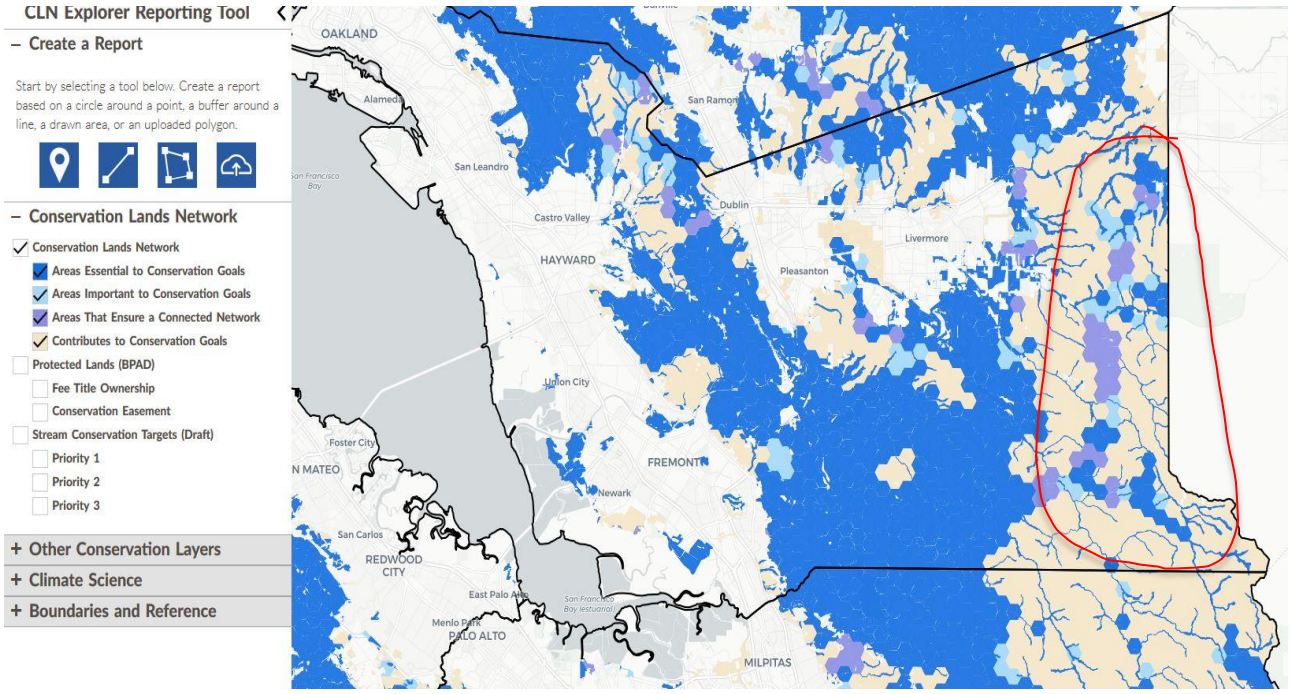
[7] Goals Project. 2015. *The Baylands and Climate Change: What We Can Do. Baylands Ecosystem Habitat Goals Science Update 2015* prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. California State Coastal Conservancy, Oakland, CA .

introduce human disturbance and attract or introduce non-native species that compete with or predate native species.

Failure to consider indirect impacts on biological resources (and hydrological and other resources) will result in significant adverse impacts to the environment. The failure of the DEIR to assess indirect impacts of PBA 2050 on biological resources is a fatal flaw and should be rectified prior to certification of the EIR.

Figure 3.5-5: *Essential Connectivity Areas*:

There appear to be fewer connectivity areas in Eastern Alameda County depicted on this figure than on the Conservation Lands Network[8] map below. Please add the areas that are missing from the DEIR map.



4.2.7 Moratorium on Flood Zone Development Alternative:

We strenuously disagree with the rationale used to reject consideration of an alternative that places a moratorium on flood zone development. In particular we object to the conclusion that:

> "Developments proposed within the 100-year flood zone would be required to meet local, State, and federal flood control design requirements, including avoiding the 100-year flood zones or providing building pads elevated above the flood zone. As discussed in Section 3.10, "Hydrology and Water Quality," impacts related to development in the flood zones would not result in significant impacts. Because this alternative would not reduce significant environmental effects compared to the proposed Plan, it is not considered in further detail in this EIR."

First, this conclusion assumes that adequate regional, State and federal regulations exist to regulate development within flood zones to ensure that the development would not result in significant adverse

[8] Conservation Lands Network Explorer Reporting Tool. https://www.bayarealands.org/explorer-v2/?z=11&y=37.58295&x=-121.79066&l=counties%2Ccln2018essential%2Ccln2018important%2Ccln2018connector%2Ccln2018contributing&b=map&localdev=

impacts. BCDC's jurisdiction is restricted to the 100' shoreline band, managed wetlands and saltponds. Section 404 of the Clean Water Act only confers regulatory authority over waters of the U.S. and the Porter-Cologne Act only regulates waters of the State. Areas that are not within the 100' shoreline band and are not waters of the State or U.S. are predominantly regulated at the local level (unless there are State or federal listed species). This is concerning with respect to the edges of the Bay. Wang et al[9] have noted "...measures to prevent flooding along an embayment shoreline in one location or subregion may increase inundation elsewhere in the system." We are one Bay. Water displaced by raised fill pads, seawalls or levees at one location must flow elsewhere. Wang et al go on to state:

> "The network of interactions occurs not only within subbasins of the Bay but also across the greater geographic extent from one end of the Bay to the other, and local jurisdiction may have either reciprocal relationships with or asymmetric impacts on one other. Importantly, the nature of the interaction network is seen to evolve with SLR: interactions are purely subregional at current sea level but with higher sea level (e.g., 1 m of SLR), not only do the subregional interdependencies strengthen but also regional interdependences emerge."

A governance gap exists due to our lack of regional control over how adaptation to sea level rise differs from one shoreline community to the next. This could have consequences throughout the region as sea level inundation rates increase. Water deflected Engineered fill pads, levees or seawalls designed to protect new development from the 100-year flood or sea level rise, has consequences for adjacent communities. As mentioned previously, these types of projects can also have significant and adverse impacts to tidal wetlands resulting in the drowning of wetlands or degradation through erosion, etc.

The San Francisco Bay Regional Coastal Hazards Adaptation Resiliency Group (CHARG), which is "an organization of flood managers and scientists responsible for reducing flood risk in the San Francisco Bay area." CHARG has created a series of maps for the Bay Area counties that depict "Sea Level Rise Connectivity Between Bay Area Jurisdictions" that can be viewed on their website: https://sfbaycharg.org/our-work/jurisdiction-connectivity/ We believe this is an admirable effort, but it only addresses impacts related to identified flood control projects, not those associated with development, transportation or recreational trails. The strategies utilized to address sea level rise inundation for these types of projects can also contribute to localized or regional exacerbation of sea level rise impacts. Thus, a moratorium to restrict construction of new development within the 100-year flood zone could in fact result in reductions of significant and adverse impacts to biological resources and residents of the Bay Area.

The DEIR must be revised to include an analysis of the potential impacts of development within the 100-year flood zone.

Proposed minimum 1:1 mitigation ratio for impacts to wetlands sets the bar too low:

Mitigation ratios should be high enough to offset the temporal losses of wetland or riparian functions and values and to ensure "no net loss of wetlands" as required by the State's Wetlands Conservation Policy (Executive Order W-59-93). A one-to-one ratio is setting the bar too low. The National Research Council in 1992 recommended ratios of at least three, five, or ten acres of mitigation wetlands or streams for every acre of wetland or stream destroyed depending on its functional value. Studies have shown that wetland and

[9] Wang, R.-Q., Stacey, M. T., Herdman, L. M. M., Barnard, P. L., & Erikson, L. (2018). The influence of sea level rise on the regional interdependence of coastal infrastructure. *Earth's Future*, 6, 677– 688. https://doi.org/10.1002/2017EF000742

stream mitigation usually fail to recreate all the functions provided by the destroyed wetlands and streams. Even when mitigation wetlands provide functions that do approach those of natural wetlands (and there are very few that have been shown to do so) studies have shown that it takes anywhere from 10 to 30 years for those functions to fully develop. For that reason, PBA 2050 should require high mitigation ratios, for example, at the minimum rate of at least three, five or ten acres of mitigation wetlands or streams for every acre of wetland or stream destroyed depending on functional value lost.

Numerous studies, beginning with the National Research Council's 1992 "Restoration of Aquatic Ecosystems,"[10] the 2001 "Compensating for Wetland Losses Under the Clean Water Act"[11] and the State Water Resources Control Board's study by Ambrose et. al. 2006[12], recognize the failure of compensatory mitigation wetlands in fully replicating the functions of natural wetlands.

Kihslinger[13], reviewed recent literature regarding wetlands compensatory mitigation compliance and success and concluded:

> Although wetland mitigation accounts for a significant annual investment in habitat restoration and protection, *it has not, to date, proven to be a reliable conservation tool*. Despite the nationwide "no net loss" goal, *the federal compensatory mitigation program may currently lead to a net loss in wetlands acres and function*. On the high end, Turner and colleagues (2001) estimated that the §404 program may lead to an 80% loss in acres and functions. [emphasis added]

Her review of the existing literature revealed:

> "Studies of the ecological performance of compensatory mitigation have shown that compensatory wetland projects fail to replace lost wetland acres and functions even more often than they fail in their administrative performance. In fact, permit compliance has been shown to be a poor indicator of whether or not mitigation projects are adequately replacing the appropriate habitat types and ecological functions of wetlands.
>
> ...In addition to not meeting acreage requirements, mitigation wetlands often do not replace the functions and types of wetlands destroyed due to permitted impacts. *Turner and colleagues (2001) found that an average of only 21% of mitigation sites met various tests of ecological equivalency to lost wetlands*. Two recent studies compared mitigation sites to *impact sites.* One found that only 17% of the sites evaluated successfully replaced lost functions (Mink and Ladd 2003). The other study determined that 29% of the sites were successful in this regard (Ambrose and Lee 2004). The former study also found that 50% of the mitigation sites evaluated were actually non-jurisdictional riparian and upland habitat. Four studies comparing mitigation sites to *reference wetlands* found that fewer than 50% of the sites evaluated were considered ecologically successful (Ambrose et al. 2006 - 19%;

[10] National Research Council. 1992. *Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy*. Washington, DC: The National Academies Press. https://doi.org/10.17226/1807.

[11] National Research Council. 2001. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, DC: The National Academies Press. https://doi.org/10.17226/10134.

[12] Ambrose, R. F., J. C. Callaway, and S. F. Lee. 2006. An evaluation of compensatory mitigation projects permitted under Clean Water Act Section 401 by the California State Water Quality Control Board, 1991–2002. Report to the State Water Resources Control Board. University of California, Los Angeles, CA, USA.

[13] Kihslinger, Rebecca. 2008. Success of Wetland Mitigation Projects. National Wetlands Newsletter Vol. 30, No. 2: 14-16

Johnson et al. 2002 - 46%; MDEQ 2001 - 22%; Sudol and Ambrose 2002 - 16%). Ambrose and colleagues' statewide study of 143 permit files in California found that 27% of the constructed mitigation did not even meet the jurisdictional definition of a wetland (Ambrose et al. 2006). [emphasis added]"

As mentioned above, a critical concern with compensatory mitigation of all types (including the use of mitigation banks), is the loss of local wetland functions and values and a reduction in the biodiversity of wetland types. Clare et al.[14] observed:

> The idea that a constructed wetland that visually resembles a natural wetland is adequate compensation ignores that wetlands grow and develop according to a myriad of highly variable inputs over time, including stochastic weather, random arrival events of species, competition, surface and groundwater interactions, and many others. The fluctuations and interactions of wetland ecosystems are more akin to human metabolism than they are to an automotive engine, with dynamic interacting components such as wetland soils, hydrologic regimes, riparian zones, and water chemistry that are linked to their surroundings. Constructed wetlands must grow, mature, and evolve, often requiring decades to centuries to stabilize and broadly resemble naturally occurring wetlands. Such time frames are rarely considered in the price of compensation.
>
> Despite the complexity of wetland ecosystems, optimistic and naive land developers, economists, engineers, and policy makers often argue for compensation over avoidance, confident in the notion that constructed wetlands can adequately replace the values and functions of a natural wetland. *The lack of focus on wetland avoidance allows for engineered compensatory wetlands to receive more political and economic value than their natural counterparts, as they provide decision-makers the options, flexibility, and negotiation room beyond a hard and fast requirement to relocate the proposed development to a nonwetland site*. The premise of compensatory offset wetland policies is that habitat loss can be mitigated through the creation or restoration of habitat that is equivalent to that which was lost. The challenges associated with measuring, let alone reproducing, the full suite of ecological, social, and economic values and functions of a natural wetland makes the reliance on this policy approach untenable in all cases*, and highlights the need to give greater consideration to avoidance in the mitigation sequence.* [emphasis added]

In addition, fragmentation of habitat patches tends to occur with individual shoreline projects and bay crossings. Fragmentation increases edge effects and diminishes connectivity links between patches. For this reason, a compensatory mitigation does not always provide equivalent potential for habitat protection. We recommend the minimum mitigation ratio for compensation of lost wetlands and waters should be a 3:1 mitigation ratio.

Conclusion:

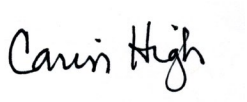
We are deeply disappointed that the 45-day public comment and review period for this DEIR and Draft Plan was not extended. There are numerous technical documents that support the assumptions utilized in the DEIR that have not been referenced in that document. A list of all documents that provide support for the conclusions reached in the DEIR and Draft Plan should be provided.

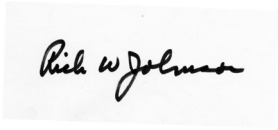
[14] Clare, Shari, Naomi Krogman, Lee Fotte, Nathan Lemphers. 2011. Where is the avoidance in the implementation of wetland law and policy? Wetlands Ecological Manage 19: 165-182

There are numerous flaws that have been identified by our consultant Richard Grassetti and in our comments above that must be resolved prior to certification of the FEIR.

We ask that we be kept informed of future opportunities for review and comment on Plan Bay Area 2050 and the EIR.

Respectfully submitted,





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