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**RE: EPIC, Humboldt Waterkeeper, & CRTP comments on the Draft Eureka–Arcata Route 101 Corridor Comprehensive Adaptation & Implementation Plan (CAIP)**

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On behalf of the Environmental Protection Information Center (EPIC), Coalition for Responsible Transportation Priorities (CRTTP), and Humboldt Waterkeeper, please accept the following comments on the Draft Eureka–Arcata Route 101 Corridor Comprehensive Adaptation & Implementation Plan (CAIP).

## **I. Summary**

We commend CalTrans for engaging the public on the development of coastal hazard adaptation strategies for the six-mile portion of US 101 between Eureka and Arcata—known as the Eureka-Arcata corridor, or safety corridor. While the CalTrans has included the expertise of local scientists, we offer the following insights and recommendations from our unique environmental and community-centered perspectives.

For the reasons outlined below, we urge Caltrans to revise the final CAIP to:

1. Establish a clear preference for accommodation strategies where feasible.
2. Prioritize viaducts in locations where they can restore hydraulic connectivity and facilitate tidal wetland migration.
3. Incorporate the following information and criteria weights into a re-evaluation of adaptation strategies.
  - a. Evaluate adaptation alternatives based on their ability to support future salt marsh, eelgrass, and estuarine habitat restoration.
  - b. Explicitly recognize that shoreline armoring and flood barriers often transfer flood and erosion impacts to neighboring areas, creating unintended environmental consequences and financial costs.
  - c. Consider the indirect financial costs associated with the redirection of ocean waters caused by hard barriers.
  - d. Weight criteria 3 and 8 more heavily to prioritize the protection of essential infrastructure (3) and environmental performance (8) of adaptation strategies.
4. Avoid, wherever possible, creating new continuous barriers that could exacerbate coastal squeeze and limit wetland migration.
5. Coordinate adaptation planning with other jurisdictions conducting wetland restoration and sea-level-rise adaptation efforts to maximize ecological benefits throughout Humboldt Bay.
6. Safe and separated bicycle and pedestrian facilities must be included in any infrastructure adaptation to sea level rise in the corridor, whether raised embankments, raised roadways, or viaducts.
7. Since traffic volumes respond to the infrastructure available, forecasting traffic volume based on population threatens the self-fulfilling prophecy of inviting higher traffic volumes with larger infrastructure - traffic volumes must not be directly correlated with population.
8. The elevation of Indianola Road beneath the recently completed crossing is only 12.08 ft NAVD88, qualifying it for adaptation under the CAIP's 16 ft NAVD88 threshold - the CAIP must consider adaptation measures for this facility.
9. Consider and thoroughly evaluate the minor retreat inland concept mentioned in Table 19, but is not further discussed in the CAIP.

10. Provide summaries of the information that was used to determine whether an adaptation strategy meets an evaluation criteria.
11. Incorporate information documenting historic contamination along the corridor, and how site remediation may contribute to project constraints.
12. The conceptual implementation plan should ensure the long-term and complete protection of the corridor by prioritizing long over short term adaptation strategies in the CAIP.

## **II. Missed Opportunities in the Evaluation of Adaptation Strategies**

### **A. Viaducts and other forms of accommodation provide substantial environmental benefits**

The draft appropriately recognizes that the Eureka–Arcata Corridor sits within one of California’s most climate-vulnerable estuarine environments and that Humboldt Bay is experiencing some of the fastest relative sea-level rise on the West Coast. The document also correctly identifies retreat, accommodation, and nature-based adaptation as important tools available to future decision makers.

However, the final CAIP should place substantially greater emphasis on accommodation strategies, particularly viaducts, expanded hydraulic connectivity, and strategic tidal restoration, wherever feasible. The long-term goal should not simply be to keep Highway 101 above water. Instead, it should be to maintain transportation infrastructure while restoring the natural functions of Humboldt Bay and avoiding future environmental degradation.

The CAIP itself notes that much of the land east of the corridor was historically connected to Humboldt Bay through a network of tidal sloughs and wetlands. These areas were diked, drained, and disconnected from the bay over the past century, transforming former tidal marshes into agricultural and developed lands. Today, sea-level rise presents not only a threat but also an opportunity: the opportunity to reconnect portions of these former tidelands to the bay and restore ecological functions that have been lost for generations. Where feasible, viaducts represent the adaptation strategy most consistent with that opportunity.

Shoreline barriers can prevent the landward migration of tidal wetlands under sea-level rise, resulting in "coastal squeeze" and long-term loss of salt marsh and beach habitat.<sup>1</sup> Unlike raised embankments, viaducts allow water, sediment, fish, wildlife, and tidal processes to move beneath transportation infrastructure. The CAIP acknowledges that viaducts can restore hydraulic connectivity between historic tidal flats and Humboldt Bay, reduce wetland impacts through a smaller footprint, avoid coastal squeeze, and create opportunities for habitat restoration. These benefits are central to the long-term ecological future of Humboldt Bay.

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<sup>1</sup> Leo, K.L., et al. (2019). "Coastal Habitat Squeeze: A Review of Adaptation Solutions for Saltmarsh, Mangrove and Beach Habitats." *Ocean & Coastal Management*.

In particular, viaducts could allow portions of currently diked or disconnected lands to transition back toward functioning tidal wetlands as sea levels rise. Over time, this would create opportunities for the expansion of salt marsh and eelgrass habitat, two of the most valuable ecosystems in Humboldt Bay. These habitats provide nursery grounds for fish, support migratory birds, improve water quality, sequester carbon, and help buffer shorelines from wave energy and flooding. Alternatively, the highway could be rerouted inland, allowing the Bay to naturally expand into areas that it once existed previously.

By contrast, raising Highway 101 primarily as a continuous embankment risks creating a larger and more permanent barrier between Humboldt Bay and adjacent low-lying lands. While embankments may be less expensive initially, they could lock the region into a future in which rising seas are trapped on one side of the highway while ecological systems decline on the other. Such an outcome would be inconsistent with the Coastal Act's directive to protect and enhance coastal resources and natural shoreline processes.

### **B. Hardening would cause significant environmental and economic impacts**

The danger is not merely the loss of restoration opportunities. Hard barriers frequently create new environmental problems elsewhere. The draft CAIP correctly notes that shoreline armoring can become maladaptive and may contribute to habitat loss, beach loss, and increased erosion in adjacent areas. Shoreline armoring alters habitat distribution, ecological connectivity, productivity, and species assemblages across coastal ecosystems.<sup>2</sup> The same principle applies at a larger landscape scale. When water is prevented from occupying one area, it does not disappear—it is displaced. Floodwaters and tidal energy are redirected toward neighboring shorelines, wetlands, infrastructure, and communities. Armored shorelines can reflect wave energy, increasing nearshore erosion and sediment export in neighboring areas.<sup>3</sup>

Therefore, a strategy that relies heavily on embankments, levees, or shoreline armoring may protect one location while increasing pressure elsewhere around the bay. Having sea waters that could have inundated agricultural and sparsely populated areas East of the 101 corridor instead inundate Eureka and Arcata is not a sustainable solution. Doing so could substantially increase the need for coastal armoring and protection of these more developed areas of Humboldt Bay at a significant cost. Of course, that armoring would then transfer sea level rise impacts to yet another area of the Bay, creating a race to the bottom that hurts all communities and ecosystems around the bay. As sea levels continue to rise throughout the century, these unintended consequences are likely to become more pronounced and more expensive to address. **The CAIP should take into account these indirect impacts associated with hard barriers along the Arcata-Eureka corridor when assessing the cost of project alternatives.** This should be explicitly referenced in the evaluation criteria.

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<sup>2</sup> Gittman, R.K., et al. (2018). "Generalizing Ecological Effects of Shoreline Armoring Across Soft Sediment Environments." *Estuaries and Coasts* 41(S1): 180–196

<sup>3</sup> Prosser, D.J., et al. (2018). "Impacts of Coastal Land Use and Shoreline Armoring on Estuarine Ecosystems: An Introduction to a Special Issue." *Estuaries and Coasts* 41(S1): 2–18.

**Accommodation strategies avoid many of these problems because they work with natural processes rather than attempting to permanently resist them.** Viaducts, larger bridge openings, hydraulic connections, breached dikes, living shorelines, or even rerouting the highway inland, can allow the bay to expand into suitable areas while preserving transportation functionality. They create flexibility for future conditions instead of requiring ever-larger barriers as sea levels rise.

The CAIP's multicriteria analysis found that adaptation strategies incorporating living shorelines, hydraulic connectivity, and viaducts generally performed best from an environmental perspective. **The final document should therefore more explicitly acknowledge that environmental performance must remain a primary consideration when selecting long-term adaptation pathways.**

This is particularly important because Humboldt Bay represents one of California's greatest opportunities for climate-resilient wetland restoration. Decisions made for the Highway 101 corridor will shape whether future sea-level rise results in the expansion of tidal habitat or the progressive degradation of the bay's ecological resources. The environmental benefits may not only be local but could also have broader benefits. The Coastal Commission's 2024 Sea Level Rise Adaptation Policy specifically states "[r]esearch has highlighted that nature-based adaptation strategies could also enhance climate adaptation through a variety of co-benefits, including increased carbon sequestration, urban cooling, and stormwater management (Buma et al., 2024)."<sup>4</sup>

Hardening causing groundwater level rise: A recent study found that shoreline barriers can amplify coastal groundwater hazards, exacerbating saltwater intrusion and emergence of groundwater.<sup>5</sup> Groundwater hazards can require pumping due to reduced soil drainage capacity, which can further increase salinity and degrade groundwater quality. The potential for pumping to lead to further intrusion can be especially problematic near contaminated sites such as the former lumber mill sites (Brainard and Bracut) and the Bracut Marsh, which was recently the subject of a U.S. EPA Brownfields Phase II Environmental Site Assessment and was found to be contaminated by legacy dioxins and furans as well as metals from former lumber mill activities.<sup>6</sup> Although increased contamination transport is listed as a potential threat under section 6.1.3 Groundwater Hazards - there is a lack of information in the CAIP about how that threat will be addressed.

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<sup>4</sup> California Coastal Commission. (2024). *Sea level rise policy guidance: 2024 adopted update*. State of California.

<https://documents.coastal.ca.gov/assets/slr/guidance/2024/2024AdoptedSLRPolicyGuidanceUpdate.pdf>; Buma, B., Gordon, D.R., Kleisner, K.M. et al. 2024. Expert review of the science underlying nature-based climate solutions. *Nature Climate Change*. <https://doi.org/10.1038/s41558-024-01960-0>.

<sup>5</sup> Su, X., K.M. Befus, and M.A. Hummel. 2024. "Shoreline Barriers May Amplify Coastal Groundwater Hazards with Sea-Level Rise." *Scientific Reports* 14:15559. <https://www.nature.com/articles/s41598-024-66273-w>

<sup>6</sup> GeoTracker. N.d. Bracut Marsh, 4065 US Highway 101, Eureka, CA. Regional Board Case #1NHU1005. [https://geotracker.waterboards.ca.gov/profile\\_report.asp?global\\_id=T10000024381](https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000024381)

Shoreline hardening can also alter tidal dynamics, elevating extreme water levels by as much as 10 cm for 1.5 m of sea level rise, whereas wetland restoration can reduce extreme water levels by as much as 20 cm.<sup>7</sup>

### C. The CAIP fails to adequately consider costs in the cost comparison

The cost comparison presented in Section 7.7 should not be interpreted as a comprehensive economic comparison between viaduct and embankment alternatives. The draft acknowledges that several major categories of costs were excluded from the analysis, including environmental mitigation, long-term maintenance, permitting, and other project-related expenses. Most of these missing categories of cost would add cost to the embankment alternative and reduce cost for the viaduct alternative. **As a result, the conclusion that viaducts cost approximately six times more than embankments reflects a misleading comparison of initial construction costs rather than the full holistic analysis of costs imposed by each alternative.**

First, the analysis does not account for the potentially substantial mitigation costs associated with embankment construction. Throughout the CAIP, viaducts are recognized as providing important environmental benefits, including restoration of hydraulic connectivity, reduced wetland impacts due to a smaller footprint, avoidance of coastal squeeze, and opportunities for salt marsh habitat creation. As discussed in the previous section, embankments create larger footprints, constrain tidal exchange, impede wetland migration, will have groundwater impacts, and other environmental impacts. These impacts will likely require compensatory mitigation under state and federal permitting requirements. The draft acknowledges that the mitigation value of viaducts is difficult to quantify at this stage, but that uncertainty should not be treated as zero. Excluding mitigation costs disproportionately favors embankments and understates the true cost difference between alternatives.

Second, the analysis does not account for indirect costs imposed on neighboring jurisdictions, landowners, and public agencies when embankments alter the movement and storage of floodwaters. An embankment functions as a barrier across the landscape. Water that would otherwise spread across historic floodplains or future tidal wetlands will be redirected elsewhere. This can increase flood elevations, erosion, drainage challenges, and infrastructure costs in adjacent areas, notably the cities of Eureka and Arcata. Those costs may ultimately be borne by local governments, resource agencies, landowners, and future adaptation projects rather than Caltrans. A complete economic analysis should evaluate whether embankment alternatives transfer flood-management costs to other parties and compare those costs against the greater hydraulic connectivity provided by viaducts.

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<sup>7</sup> Nederhoff, K., R. Saleh, P. L. Barnard, and M. Stacey. 2025. "Mitigating Flood Risks in Urban Estuaries: Tidal Dynamics, Shoreline Hardening, Nature-Based Solutions, and Floodgates in San Francisco Bay." *J. Waterway, Port, Coastal, Ocean Eng.* 151(6): 04025031. <https://ascelibrary.org/doi/epdf/10.1061/JWPED5.WWENG-2342>

Third, the comparison does not evaluate long-term maintenance costs. The CAIP itself notes that viaducts are less susceptible to rutting, fatigue failure, and water infiltration impacts than earthen embankments. The document also states that drainage channel maintenance associated with viaducts would be "markedly reduced or non-existent." In contrast, embankments in a low-lying estuarine environment may require ongoing maintenance associated with settlement, drainage infrastructure, erosion protection, culverts, and adaptation to changing sea-level conditions. A project intended to function through 2100 should be evaluated using life-cycle costs rather than construction costs alone.

For these reasons, the cost comparison presented in Section 7.7 should be characterized as a preliminary capital-cost comparison rather than a comprehensive economic analysis. Before selecting long-term adaptation strategies, Caltrans should prepare a life-cycle cost assessment that includes environmental mitigation, long-term maintenance, permitting obligations, indirect flood impacts on neighboring jurisdictions, and ecosystem-service benefits associated with restored tidal habitat and hydraulic connectivity.

#### **D. Evaluation Criteria Should be Weighted to Reflect Community Priorities**

The tool used to evaluate adaptation strategies has fourteen criteria, any of which can be weighted to 'reflect local priorities'. Of the fourteen evaluation criteria, only "cost" is weighted more heavily than others, which reflects the priorities of CalTrans - not the local community. While cost is an integral factor to consider when evaluating the feasibility of adaptation options, weighting only the cost criteria fails to adequately prioritize sustainability. According to the evaluation tool, there are three categories of criteria that make up sustainability: Society and Equity, Economy, and Environment. Cost falls under the Feasibility category - weighting only the "cost" criteria unfairly skews the evaluation away from sustainability.

The indirect impacts associated with shoreline hardening, environmental benefits of viaducts, and life cycle costs outlined in the above sections should be incorporated into the evaluation tool. Additionally, we recommend the following specific criteria receive higher weights:

- **ECONOMIC**
  - **(3) Maintain essential infrastructure or community assets:** "Strategies that protect essential infrastructure or community assets meet this criterion, while strategies that harm essential infrastructure or community assets do not."
    - *The corridor currently shields critical infrastructure - natural gas, electricity, water, and waste water lines (see map on CAIP p. 48). Disruption of the services provided by this infrastructure could have cascading impacts throughout the region, thus this criteria should be weighted to reflect the reliance of our region on that infrastructure.*
- **ENVIRONMENT**
  - **(8) Environmental Performance:** "Strategies with no permanent negative impacts (temporary negative impacts are less than a year) or all final environmental impacts are beneficial meet this criterion, while strategies that result in numerous or extensive environmental impacts do not."

- *The Humboldt Bay community relies upon the estuary for food, income, and recreation. Weighting this criteria more heavily would result in an evaluation, and selection, of adaptation strategies better aligned with community values and priorities.*

**In addition to these added weights, unintended negative consequences of an adaptation strategy should decrease the likelihood of that strategy meeting the criteria impacted by such consequences.** For example, Cal Trans should explicitly recognize and account for the impacts from shoreline armoring and flood barriers, which often transfer flood and erosion impacts to neighboring areas, creating unintended environmental consequences and financial costs.

**To truly reflect community priorities in the evaluation tool, CalTrans should seek community input on which criteria should be weighted heavier than others, and use that feedback to increase or decrease the weights of various criteria for the next iteration of the CAIP document.** We recommend designing and deploying a short survey to gauge the public's priorities during the public workshop tentatively planned for the end of this year.

#### **E. What information contributed to determining if criteria were met?**

CalTrans should share more information on the methodology behind the evaluation tool.

For example, under criteria number 8 - Environmental Performance it is noted that, "strategies with no permanent negative impacts (temporary negative impacts are less than a year) or all final environmental impacts are beneficial meet this criterion, while strategies that result in numerous or extensive environmental impacts do not." (p. 146) Scientists and knowledgeable citizens could better contribute to the CAIP if CalTrans shares the information that was used to determine the extent of an environmental impact.

While Table 21 (starting on p.148) provides more detail on what each numerical score means for each criteria and Appendix F provides the final scores and criteria weight given to each adaptation strategy, more specific information is needed to demonstrate how CalTrans arrived at scores for each criteria and adaptation strategy. **We recommend an additional appendix to cover this topic.**

### **III. Evaluate Minor Retreat Inland Alternative**

CalTrans should consider and thoroughly evaluate an alternative that involves relocating the highway midway between its current alignment and Old Arcata Road. This approach could have several advantages, including eliminating the need for shoreline hardening, elevating the corridor, and construction of living shorelines by converting mudflats and eelgrass habitat (which would require tremendous amounts of clean fill). It could also restore tidal influence to many acres of former tidelands, restoring large areas of saltmarsh and salmon-bearing stream habitat. This strategy also reduces traffic flow logistics, by producing less disruption to travelers on the existing roadway during construction. Most importantly, it would be a longer-term solution as

opposed to the raised embankment approach to “Protect” the highway, which would be an expensive, impactful, half-measure that would only last until 2050 or, at most, 2060.

#### **IV. Transportation**

##### **A. Safe and Separated Bicycle and Pedestrian Facilities**

Safe and separated bicycle and pedestrian facilities must be included in any infrastructure adaptation to sea level rise in the corridor, whether raised embankments, raised roadways, or viaducts. The Humboldt Bay Trail currently provides a safe bike and pedestrian facility, but is also vulnerable to the effects of sea level rise. And while the trail is not technically within Caltrans right-of-way, it is part of the same transportation corridor, a fact recognized by the California Coastal Commission when permitting the Eureka-Arcata Corridor Improvement Project.

It is crucial for the CAIP to specify that each and every project which includes sea level rise adaptation as part of its design must include safe and separated bicycle and pedestrian facilities. As the CAIP notes, adaptation projects in the corridor are likely to be built piecemeal, rather than all at once, and each project is likely to have multiple objectives. In that context, project managers may not prioritize bicycle and pedestrian facilities, particularly if the Humboldt Bay Trail is still functional at the time of project construction and/or surrounding corridor segments do not yet have bicycle and pedestrian facilities. But in order to ensure complete bicycle and pedestrian facilities throughout the corridor as sea level rise progresses, each project must include them.

##### **B. Planning for Future Transportation Volumes**

The CAIP notes that traffic volume forecasts are based in part on population (p.112). However, traffic volumes need not be—and for the sake of reducing greenhouse gas emissions must not be—directly correlated with population. Rather, we know from the well-established principle of induced travel that traffic volumes respond to the infrastructure available, and projecting future traffic growth becomes a self-fulfilling prophecy if we build higher capacity highways to accommodate these projections. For this reason, it is critical not to overbuild future vehicular infrastructure and instead to prioritize better pedestrian, bicycle, and transit infrastructure to encourage greater use of these climate-friendly modes.

##### **C. Elevation of the Indianola Undercrossing**

The CAIP identifies facilities under 16 ft NAVD88 as requiring adaptation for sea level rise, and notes that the elevation of Indianola Road beneath the recently complete undercrossing is only 12.08 ft NAVD88. Yet because US-101 itself is not at risk from sea level here, due to being raised above Indianola Road, the segment of US-101 including the undercrossing is listed as not requiring any adaptation measures.

While Indianola Road may not be a Caltrans facility, the portion beneath US-101 is within Caltrans right-of-way and is at risk from sea level rise. It is an important vehicular connection to

US-101 and an important bicycle and pedestrian connection to the Humboldt Bay Trail, a crucial part of the Eureka-Arcata transportation corridor. The CAIP must consider adaptation measures for this facility.

## V. Conceptual Implementation Plan

The Conceptual Implementation Plan (CIP) relies too heavily on the intermediate sea level rise scenario and short and mid-term adaptation strategies, failing to adequately plan and prioritize timely implementation of long-term strategies. The precautionary approach (defined by the Coastal Commission as using high and extreme projections for SLR) and the OPC SLR guidance recommend use of the intermediate-high and high scenarios for long-term planning. The CIP draft timeline initiates long-term strategies in 2060 - at that point the high scenario projection is already double the intermediate scenario. The actions of the current federal administration, impacts of seasonal cycles (i.e., El Niño), and record breaking King Tides in Humboldt Bay this past winter should all be taken under consideration when choosing which scenario and environmental triggers are used to develop this timeline. While the phased approach may be necessary due to project constraints, **the CIP should prioritize early planning of long-term solutions to avoid the continual band-aid application of short and mid-term strategies, and take on a stronger sense of urgency to respond to SLR.**

CalTrans should not wait until after the implementation of the 12-foot grade raise via project 0M270 to “confirm the anticipated SLR pathway and refine the timing of future adaptation projects” (p. 158). The CAIP is the appropriate document to identify long-term projects. The CIP notes that the timeline for long-term projects may shift according to the implementation of additional short or midterm measures that enhance the resilience of the corridor. Both of these offers for flexibility raise concerns of snowballing costs and lack of true long-term planning. Given current funding constraints, implementation of long-term strategies should be prioritized over short and midterm strategies, to limit the amount of funding needed to completely protect the corridor. Short term strategies like the raised embankment scored poorly overall

In the case that short or midterm measures are necessary, the timeline for planning and building long term measures should be *accelerated*, even if those short or midterm measures enhance corridor resilience. In this scenario, at a minimum, short and midterm measures that work in tandem with or enhance future long-term measures should be prioritized. For example, breaching the levee at Fay Slough Wildlife Area would pair well with the long-term solution of building a viaduct - the levee breach could prevent tidal flood waters from overtopping the corridor, create saltwater marsh habitat and act as mitigation for the future viaduct. Additionally, living shorelines are identified as useful interim measures, but they should only be considered as mitigation or in tandem with other measures due to the current infeasibility of sourcing the clean fill necessary to build them.

As evidenced by the seven years between approval of CDP 1-18-1078, and the publication of this CAIP, planning alone can take years, and by the time long-term strategies are properly permitted, local communities could already face unsafe and or impossible travel through the

corridor. **CalTrans has an opportunity and obligation to plan the long-term and complete protection of the corridor by prioritizing long over short term adaptation strategies in the CAIP.**

## **VI. Addressing Historic Contamination**

Throughout the CAIP, there are references to Brainard and Bracut Industrial Park, both of which are known contaminated sites adjacent to Highway 101. However, neither the CAIP nor the Technical Memo assessing groundwater hazards<sup>8</sup> include information on the soil and groundwater contamination from these former lumber mills, resulting in a major omission in the Groundwater Hazard Section (6.1.3). In the Coastal Commission staff report for the Humboldt Bay Trail South Coastal Development Permit, Special Conditions required that soil impacted with arsenic and lead in segments 4, 7, and 8, and soils impacted with dioxins in segment 5 shall be contained, handled, and properly disposed of in a manner that prevents discharge of contaminated soil and groundwater to the surrounding environment and that excess soil shall not be reused on site as fill material.<sup>9</sup> These segments are adjacent to the Brainard Lumber Mill nor the Bracut Industrial Park, neither of which have been the subject of Phase II Environmental Site Assessments to characterize the extent and magnitude of soil and groundwater contamination (Figure 1). Until site assessments have been completed, it is reasonable to assume that further contamination is present on both of these former lumber mill sites. The State Coastal Conservancy's Bracut Marsh property, immediately adjacent to Bracut Industrial Park, was the subject of a recent U.S. EPA Brownfields Phase II Environmental Site Assessment which found elevated dioxins and furans, arsenic, copper, and other metals in soil and groundwater in various locations (Figure 1).<sup>10</sup>

Increased contaminant transport is listed as a potential threat under section 6.1.3 Groundwater Hazards. In addition to an incomplete assessment of contaminated sites within and adjacent to the Area of Potential Effects, there is also a lack of information about how that threat will be addressed.

**The CAIP must consider and address the potential for contaminants in soil and groundwater to be remobilized off-site, and how impacts to the aquatic ecosystems will be avoided during construction and as a result of any adaptation projects that are implemented.** Contaminant assessment and remediation should be included in Chapter 4 - Constraints and Opportunities. Funding constraints and opportunities for site remediation should be included in the Funding subsection of this chapter.

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<sup>8</sup> Lang, M. 2025. "Technical Memo for the Comprehensive Adaptation and Implementation Plan: Groundwater Hazard Assessment." Cal Poly Humboldt, Arcata, CA. [See p. 21, Contaminated Sites in Project Area.]

<sup>9</sup> California Coastal Commission. 2022. Staff Report for CDP 1-20-0560 (Humboldt County DPW). <https://documents.coastal.ca.gov/reports/2022/4/Th17a/Th17a-4-2022-report.pdf>

<sup>10</sup> State Water Resources Control Board. 2026. GeoTracker: Bracut Marsh, Regional Board Case # 1NHU1005. [https://geotracker.waterboards.ca.gov/profile\\_report.asp?global\\_id=T10000024381](https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000024381)

We support the recommendations made by Cal Poly Humboldt in the vulnerability assessment to monitor the seasonal dynamics of groundwater elevation. Should CalTrans implement this recommendation, we request the resultant data be shared publicly as this could benefit regional sea level rise planning.

Sincerely,

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Figure 1. Dioxin contamination in groundwater, soil, and sediment at the Bracut Marsh, Bracut Industrial Park, and Humboldt Bay Trail South. Map by Humboldt Waterkeeper from publicly-available reports (see footnotes 9 and 10).

