

East Bay Discharges Authority First Mile Horizontal Levee Project

Location

Hayward, CA

Project Budget

\$600,000 through 2023

Schedule

- Design Kickoff – 2021
- 30% Design – 2023
- Final Design – tbd
- Permitting – tbd
- Construction – tbd

Sponsors

- East Bay Dischargers Authority
- San Francisco Estuary Partnership
- East Bay Regional Park District



Project Objectives

- Address flood hazards from sea level rise along the Hayward shoreline.
- Provide water quality improvement for wastewater and/or stormwater from the surrounding areas.
- Provide high tide refugia and a transgression pathway for critical species in the face of sea level rise.
- Collaboratively implement the Hayward Area Shoreline Planning Agency (HASPA) Shoreline Adaptation Master Plan.
- Chart a path forward for permitting multi-benefit nature-based shoreline adaptation projects.

Project Overview

The First Mile Horizontal Levee Project is a multi-benefit adaptation project using nature-based solutions to provide sea level rise resilience, water quality improvement, and habitat enhancements, in addition to the flood protection functions of a more traditional levee. The project will apply the concept behind the Oro Loma Horizontal Levee Demonstration Project to an approximately one-mile reach of the Hayward shoreline between Bockman Canal and Sulphur Creek.

The First Mile project is part of a system of sea level rise adaptation measures identified in the Hayward Shoreline Adaptation Master Plan adopted by HASPA in 2021.

Project elements include a horizontal levee along the perimeter of Oro Loma Marsh adjacent to Bockman Canal and Union Pacific Railroad, enhancement of existing wetland and transitional habitats, and widening of Sulphur Creek to create additional tidal wetlands. Water sources for the horizontal levee may include stormwater, treated wastewater, or reverse osmosis concentrate.

Anticipated Project Benefits

The basic components of the Horizontal Levee include a levee core designed to provide flood protection and, on the outboard side of the levee, an ecotone slope containing water quality treatment features. In addition to water quality benefits, the ecotone slope will provide an upland transition zone for tidal marsh species, absorb energy from wave action and storm surge, and be a source of organic material to support marsh plain accretion in the face of sea level rise.

Regulatory Permitting Considerations

First Mile would be the first large-scale project of this type constructed within existing tidal marsh habitat. Due to the site constraints (adjacent flood channels and railroad right-of-way), the ecotone slope would extend into existing tidal marsh and would result in some level of permanent loss of existing aquatic habitat.

The team proposes to evaluate habitat impacts relative to existing conditions and future conditions with sea level rise. Preliminary consultations with the BRRIT¹ have been mixed on this topic. Some agencies, such as the San Francisco Bay Regional Water Quality Control Board (RWQCB), have expressed openness to the concept of considering future conditions in the permitting process, while others including the USACE may have limited ability to acknowledge future conditions in their impact evaluation process. Representatives from the USFWS, NMFS, CDFW, and BCDC have encouraged consideration of impacts to permanent and temporal effects on habitat under existing conditions and 30 to 50 years beyond project construction completion. Under future conditions with sea level rise, a portion of the constructed ecotone slope will be underwater, thus requiring compensatory mitigation analysis of an area that will transition from upland to wetland in the future seems an inefficient application of effort.

Guidance on the mitigation implications of the project has been mixed. Regulatory representatives have encouraged use of resources like the Aquatic Type Conversion Evaluation Framework (SCCWRP, USEPA 2022²) to calculate the long-term habitat benefits rather than jumping to mitigation discussions. Yet, the regulatory agency representatives are not yet aligned on how to evaluate potential existing and future conditions associated with shoreline climate adaptation. The possible mitigation implications from guidance received so far represent the largest potential hurdle to advancing the First Mile and other horizontal levee projects. The project team is considering expanding the project area to incorporate impact balancing opportunities identified elsewhere within the HASPA master plan.

Multiple water sources, including treated wastewater, reverse osmosis concentrate, and stormwater discharges, are yet to be designed and discussed in detail with the regulatory agency team. However, the RWQCB's NPDES

¹ San Francisco Bay Restoration Regulatory Integration Team (BRRIT). <https://www.sfbayrestore.org/san-francisco-bay-restoration-regulatory-integration-team-brrit>

² Southern California Coastal Water Research Project and U.S. Environmental Protection Agency. 2022. [1110_ConversionFramework.pdf](https://www.sccwrp.org/1110_ConversionFramework.pdf) ([sccwrp.org](https://www.sccwrp.org))

Permitting Fact Sheet for Nature-Based Solutions³ is a positive step forward for the horizontal levee treatment zone concept. The Palo Alto Horizontal Levee Pilot Project (City of Palo Alto) is the first to test the horizontal levee wastewater polishing treatment concept in an area with direct connection to the San Francisco Bay shoreline, and lessons learned will be incorporated into the First Mile and other similar projects.

Public access requirements from San Francisco Bay Conservation and Development Commission (BCDC) may conflict with wildlife protection objectives. Further consultation will be needed to find a balance between these uses.

Once the project is constructed, monitoring and adaptive management actions may be needed to maintain project goals over time, and may be required as conditions of regulatory agency permits and approvals. Post-construction actions will require a financial commitment by the project sponsors for many years following construction. Further, some adaptive management plan actions may disturb sensitive species or habitats and need additional permitting support. For example, if the levee slope needed to be regraded to improve habitat establishment and/or wastewater treatment polishing, that action may require regulatory agency approval due to the potential for harm to protected species during the process. This action may occur after the initial project construction permits have expired and require a new suite of regulatory agency approvals. It may be possible to incorporate some post-construction adaptive management activities within the initial project construction approval process, but those activities would need to be evaluated within the project's CEQA/NEPA compliance document and included in the permit application packages, so forward advanced planning would be required.

Conclusions and Next Steps

How is this project an example for successful permitting pathways for other horizontal levee projects? – To be determined. This project has triggered a discussion of regional mitigation planning needs for sea level rise adaptation efforts. Future discussions with the [Transforming Shorelines Collaborative](#) and regulatory decision-making forums will need to keep the conversation moving forward.

Engagement with the BRRIT has provided early agency input to the project design and highlighted the potential need to expand the project area to accommodate habitat mitigation requirements. Early engagement with the BRRIT indicates that programmatic restoration permit pathways will not likely apply to this multi-beneficial horizontal levee project, such as USACE's current Clean Water Act Nationwide Permit Program Number 27 for Aquatic Habitat, Restoration, Enhancement and Establishment Activities. However, future discussions regarding potential application of at least some of the recent statewide programmatic restoration permit and approval pathways are planned.

Considerations to proceed with the project include demonstrating habitat benefits in comparison to existing conditions, compensatory mitigation costs, long-term maintenance costs, and others.

³ San Francisco Bay Regional Water Quality Control Board. 2022. NPDES Permitting for Nature-based Solutions Fact Sheet.