

COASTAL CONSERVANCY

Staff Recommendation  
February 6, 2020

**PALO ALTO HORIZONTAL LEVEE PILOT PROJECT**

Project No. 19-048-01  
Project Manager: Shalini Kannan

**RECOMMENDED ACTION:** Authorization to disburse up to \$500,000 to the Association of Bay Area Governments to prepare 60% designs and permit applications for the Palo Alto Horizontal Levee Pilot Project adjacent to the Palo Alto Regional Water Quality Control Plant, City of Palo Alto, Santa Clara County.

**LOCATION:** City of Palo Alto, Santa Clara County

**PROGRAM CATEGORY:** San Francisco Bay Area Conservancy Program

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EXHIBITS

- Exhibit 1: [Project Location Map](#)  
Exhibit 2: [Site Photographs](#)  
Exhibit 3: [Letters of Support](#)
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**RESOLUTION AND FINDINGS:**

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Sections 31111, 31113, and 31160-31165 of the Public Resources Code:

“The State Coastal Conservancy hereby authorizes the disbursement of an amount not to exceed five hundred thousand dollars (\$500,000) to the Association of Bay Area Governments (“the grantee”) to prepare 60% project designs and permit applications for the Palo Alto Horizontal Levee Pilot Project, adjacent to the Palo Alto Regional Water Quality Control Plant, in the City of Palo Alto in Santa Clara County.

Prior to commencement of the project, the grantee shall submit for the review and written approval of the Executive Officer of the Conservancy (Executive Officer) the following:

1. A detailed work program, schedule, and budget.
  2. Names and qualifications of any contractors to be retained in carrying out the project.
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3. A plan for acknowledgment of Conservancy funding and Proposition 1 as the source of that funding.”

Staff further recommends that the Conservancy adopt the following findings:

“Based on the accompanying staff report and attached exhibits, the State Coastal Conservancy hereby finds that:

1. The proposed authorization is consistent with Chapter 3 of Division 21 of the Public Resources Code, Section 31111 regarding funding grants to public agencies to undertake planning, and with Chapter 4.5, regarding the San Francisco Bay Area Conservancy Program.
  2. The proposed project is consistent with the current Conservancy Project Selection Criteria and Guidelines.”
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**PROJECT SUMMARY:**

Staff recommends that the Conservancy authorize the disbursement of up to five hundred thousand dollars (\$500,000) to the Association of Bay Area Governments (ABAG) for the San Francisco Estuary Partnership (SFEP, a project of ABAG) to develop 60% designs and permit applications for a multi-benefit horizontal levee pilot project. The Palo Alto Horizontal Levee Pilot (PAHLP) project is located within the City of Palo Alto’s Baylands Nature Preserve, and adjacent to its wastewater treatment plant, the Palo Alto Regional Water Quality Control Plant (RWQCP). Exhibits 1 and 2 contain the project location and site maps. The project would build a gentle, vegetated slope that provides multiple benefits including habitat for sensitive and endangered species, wastewater polishing treatment, public access, and flood protection for adjacent communities and City of Palo Alto (City) infrastructure.

This project’s location presents habitat, flooding, and water quality issues, making it optimal for the type of multi-benefit nature-based infrastructure intervention proposed. The Baylands Nature Preserve is one of the most significant areas of native marsh vegetation, waterfowl/shorebird habitat, and habitat for endangered species including the salt marsh harvest mouse and Ridgeway’s rail. However, the project site currently consists of poor-quality upland habitat that quickly transitions from the adjacent tidal marsh to the existing levee system. Existing levees in the project area reduce some potential flooding from the Bay for key City infrastructure including the RWQCP. However, the levees don’t meet FEMA accreditation standards, and currently allow overtopping during some coinciding king tide and storm events, making them very vulnerable to future sea-level rise. Furthermore, RWQCP, like most wastewater treatment plants, discharges effluent with certain residual contaminants, including nutrients and contaminants of emerging concern, such as pharmaceuticals. While the RWQCP currently meets all discharge permit limitations, there remains opportunity to improve Bay water quality by further treating this effluent.

The project will uniquely address this suite of challenges by designing a gently sloped vegetated levee irrigated with treated wastewater. Native plantings and an upland transition zone would

support the recovery of species that utilize the surrounding Palo Alto Baylands, by providing high-tide refugia. Designs will provide accommodation space for tidal wetlands to adapt to sea-level rise by shifting landward, with a planting palette selected for endangered species and overall habitat success. The vegetated slope would provide erosion protection on the coastal side of the levee, and encourage sediment and biomass accretion, which can build the ground surface elevation, and contribute to sea-level rise resilience. As wastewater flows along the horizontal levee, nutrients such as nitrogen and phosphorus provide plants with nutrition for growth, while plant uptake leaves the water flowing to the Bay cleaner. Similarly, the levee would further polish treated wastewater entering the Bay from the RWQCP by removing contaminants of emerging concern via adsorption to soils, plant uptake, biological breakdown, and/or photodegradation. Water quality benefits are supported by monitoring data from the grantee's previous Oro Loma Horizontal Levee project.

Although flood protection is not a primary objective, the project will be designed to work in concert with a larger adjacent flood control effort known as the SAFER Bay Levee Project, which is focused on shoreline protection in both San Mateo and Santa Clara Counties. When constructed, the project would help protect the RWQCP, the San Francisco Bay Trail, and surrounding communities from flooding.

The project will also plan for recreation and public access opportunities, including maintenance of existing trail connections, via habitat-compatible trails that enable wildlife observation and enjoyment of natural resources. The planning will provide particular consideration of access and recreational benefits to the adjacent low-income community of East Palo Alto.

The specific tasks for this funding authorization include stakeholder outreach and engagement activities, completing 60% project designs, developing and working on a permitting strategy, and conducting required environmental studies (e.g., biological surveys, species assessments, botanical surveys). Outreach will include community workshops engaging both community members and technical experts, including the SAFER team, with one focusing specifically on involving disadvantaged communities in the project. The grantee is consulting with the Bay Restoration Regulatory Integration Team (BRRIT), but anticipates additional permitting requirements and challenges due to the project's wastewater reuse component.

The project team will also receive input from SFEP's Transforming Shorelines project, convenes experts in planning, water quality, engineering and sea-level rise adaptation to exchange best practices for nature-based shoreline infrastructure at wastewater treatment facilities. The Collaborative will provide technical review and bring experts into the project's design.

**Site Description:**

The PAHLP project site falls within the City of Palo Alto's Baylands Nature Preserve (Exhibit 2). With one of the largest areas of undisturbed marshland in the San Francisco Bay, this preserve hosts a substantial resident population of birds and serves as a major migratory stopover on the Pacific Flyway. It also supports habitat for the endangered salt marsh harvest mouse and Ridgeway's rail.

The project site is bounded by tidal marsh on the east, north and south, and by Embarcadero Road and the existing flood control levee on the west. Inland of the site and protected by the levee lies City infrastructure, such as the RWQCP, airport, and corporation yard, as well as private office buildings and other development extending landward of Highway 101. The RWQCP, owned and operated by the City, treats and discharges wastewater from the communities of Palo Alto, Mountain View, Los Altos, Los Altos Hills, Stanford University, and those in the East Palo Alto Sanitary District.

The project site currently hosts the Marsh Front Trail that enables public enjoyment of surrounding marshland and connects the public to other trails north and south of the project site. The adjacent trail network receives around 600,000 visitors per year.

Adjacent to the project site is the proposed alignment of the San Francisquito Creek Joint Powers Authority's (SFCJPA's) large-scale Strategy to Advance Flood protection, Ecosystems, and Recreation along San Francisco Bay (SAFER Bay) project. The SFCJPA includes the City of Palo Alto, a key partner on the PAHLP project, and other neighboring cities and county flood agencies. The SAFER Bay project includes FEMA-accredited levees that can accommodate an additional three feet of sea-level rise. Still in its feasibility phase, the SAFER Bay project is considering several levee alignments along the Palo Alto shoreline all of which include the project location for the PAHLP.

**Grantee Qualifications:**

The grantee, ABAG, provides contracting and financial services for SFEP which will perform the work under this grant. SFEP was established in 1988 under the Clean Water Act's National Estuary Program when the San Francisco Estuary was designated as an *estuary of national significance*. For over 20 years, SFEP has undertaken many large-scale, multi-million-dollar projects funded by government grants and contracts designed to improve water quality in the Bay Area. With dozens of key agencies and nonprofits involved in the conferences, committees, and programs of SFEP, there is a track record of achievement and project management needed to complete this project. SFEP works with over 80 governmental agencies, consortiums, NGO's, and scientific institutions to implement the Comprehensive Conservation and Management Plan (CCMP), a set of 32 Actions for a Healthy Estuary. The CCMP works on a 5-year planning horizon and includes measurable environmental and programmatic outcomes.

**Project History:**

The project fits under two SFEP initiatives/projects: the "Transforming Urban Water" initiative that advances innovative nature-based solutions for the San Francisco Bay shoreline in conjunction with wastewater treatment facilities; and the "Transforming Shorelines Project," funded by the EPA Water Quality Improvement Fund, which will establish a regional collaborative focusing on linking wastewater treatment management to nature-based projects. During the 2017-2018 Resilient by Design competition, the "South Bay Sponge Project" incorporated early phase conceptual designs for the Palo Alto Horizontal Levee Project, and proposed a large-scale green infrastructure approach for the South Bay shoreline. The project builds off a multi-year, collaborative process to transfer lessons learned from the grantee's Oro Loma Horizontal Levee project and ecotone restoration science to advance regional objectives

in partnership with wastewater treatment plants. Towards the end of the Oro Loma project, SFEP set aside funding to advance the design at additional sites around the Estuary. The project site was selected for its high potential for successful implementation, along with the significant needs described above. Project location identification, conceptual design drawings, initial cost estimates and a permitting strategy for the project were completed in 2018.

The remaining pre-construction work is conceived in two phases. Phase 1 includes developing 30% Preliminary Design (Exhibit 3), a detailed permitting strategy, and an outreach strategy to engage stakeholders in the design process. This began in 2018 when the City of Palo Alto and SFEP received additional funds from EPA Climate Ready Estuaries.

Phase 2 includes 100% design and permitting. The project proposed currently for funding represents a portion of Phase 2 and would result in implementing the outreach strategy, developing 60% designs, environmental documentation, and permitting.

The project will also provide SFEP an opportunity to collaborate with the SFCJPA to reduce levee cost, and maximize additional habitat benefits to what could be a more classic, gray-infrastructure design.

#### PROJECT FINANCING

<b>Coastal Conservancy</b>	<b>\$500,000</b>
City of Palo Alto	\$275,000
EPA Water Quality Improvement Fund	\$225,000
<b>Project Total</b>	<b>\$1,000,000</b>

The anticipated source of Conservancy funds for this project is the fiscal year 19/20 appropriation to the Conservancy from the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1, Water Code section 79700 et seq.). Funds appropriated to the Conservancy derive from Chapter 6 (commencing with § 79730) and may be used “for multi-benefit water quality, water supply, and watershed protection and restoration projects for the watersheds of the state.” (section 79731.). This project addresses several of the specific purposes of Chapter 6, which include protecting and restoring coastal watersheds including bays and nearshore ecosystems; reducing contamination of coastal waters; restoring natural system functions that contribute water quality and flood management; and assisting in the recovery of endangered, threatened, or migratory species by improving watershed health through wetland restoration. ( section 79732).

As required by Proposition 1, the proposed project provides multiple benefits as described in the Project Summary section above. The proposed project was selected through a competitive grant process under the Conservancy’s Proposition 1 Grant Program Guidelines (See section 79706). The proposed project meets each of the evaluation criteria in the Prop 1 Guidelines as described in further detail in this Project Financing section and in the “Project Summary” and

“Consistency with Conservancy’s Project Selection Criteria & Guidelines” sections of this staff recommendation.

The City of Palo Alto will provide \$275,000 to fund technical studies. In addition, the Environmental Protection Agency Region 9 awarded the grantee a \$1,400,00 Water Quality Improvement Fund grant for its parallel “Transforming Shorelines Project;” the grantee will contribute \$225,000 of this award towards this Palo Alto Horizontal Levee Project in the form of both direct costs and in-kind staff time.

**CONSISTENCY WITH CONSERVANCY’S ENABLING LEGISLATION:**

The proposed project would be undertaken pursuant to Sections 31111, 31113, and Chapter 4.5 of the Conservancy’s enabling legislation, Public Resource Code (PRC) Sections 31160-31165, which establishes that the Conservancy may award grants in the nine-county San Francisco Bay Area towards the resource and recreational goals of the San Francisco Bay Area Conservancy Program.

Consistent with Section 31162(b), the proposed project would award a grant to restore and enhance natural habitats, including improving water quality, in the regionally-important Palo Alto Baylands.

This project is appropriate for prioritization under the selection criteria set forth in Section 31163(c), and in determining the amount of Conservancy funding for this project, the factors identified in Section 31163(c) have been considered and applied, as described in detail below, under the heading “Consistency With Conservancy’s Project Selection Criteria & Guidelines.”

Section 31111 permits the Conservancy to award grants to public agencies for the purpose of undertaking project planning. The project will result in a community-vetted, feasible design, ready for final design, permitting and eventual construction. Section 31113 authorizes the Conservancy to undertake projects that address the impacts and potential impacts of climate change on resources within its jurisdiction. A major component of the project involves planning to address potential flooding impacts to infrastructure, and to adapt to sea-level rise.

**CONSISTENCY WITH CONSERVANCY’S [2018-2022 STRATEGIC PLAN](#) GOAL(S) & OBJECTIVE(S):**

Consistent with **Goal 8, Objective B** of the Conservancy’s 2018-2022 Strategic Plan, the proposed project plans and designs adaptation measures to increase resilience to sea-level rise.

Consistent with **Goal 12, Objective C** of the Conservancy’s 2018-2022 Strategic Plan, the proposed project develops plans for enhancement of tidal wetlands, upland habitat, and subtidal habitat.

**CONSISTENCY WITH CONSERVANCY’S PROJECT SELECTION CRITERIA & GUIDELINES:**

The proposed project is consistent with the Conservancy’s Project Selection Criteria and Guidelines, last updated on October 2, 2014, in the following respects:

## Required Criteria

1. **Promotion of the Conservancy’s statutory programs and purposes:** See the “Consistency with Conservancy’s Enabling Legislation” section above.
2. **Consistency with purposes of the funding source:** See the “Project Financing” section above.
3. **Promotion and implementation of state plans and policies:**
  - *California @ 50 Million: The Environmental Goals and Policy Report.* The Project aligns with the strategy area of “Steward and Protect Natural and Working Landscapes,” specifically the goals associated with supporting multi-benefit projects and building resilience into natural systems through natural and green infrastructure solutions. The project plans would incorporate natural systems and green infrastructure elements into what normally would be a traditional flood protection levee.
  - *CA Climate Adaptation Strategy/Safeguarding California: Reducing Climate Risk Plan.* The project implements Action B-2.1, B-2.2 by identifying an area for refugia and evaluating resiliency of the natural landscape through a pilot project that could support planning at a broader, landscape scale. Plans produced by the project will also address Action B-3.2, by restoring a vulnerable ecosystem with native plant stock that will increase the likelihood of population persistence into the future.
  - *SFEP Comprehensive Conservation and Management Plan (Estuary Blueprint).* Tasks 3.1a, 4.3, 4.4, and 14.a focus on the protection of tidal wetlands and transition zones, and development of nature-based shoreline infrastructure projects. The project, once implemented, would create a key transitional zone between fresh and brackish wetlands along the shoreline of Palo Alto.
4. **Support of the public:** The project has received broad public support, including from public agencies such as the City of Palo Alto, the San Francisco Bay Regional Water Quality Control Board, and Valley Water (formerly the Santa Clara Valley Water District), and the regional organizations of San Francisco Estuary Institute, and Bay Area Clean Water Agencies. Non-profit organizations that support the project include San Francisco Baykeeper, Save the Bay, Tuolumne River Trust, CLEAN South Bay, and Friends of Palo Alto Parks. See Project Letters in Exhibit 4.
5. **Location:** The project is located in the City of Palo Alto in Santa Clara County, which falls within the jurisdiction of the San Francisco Bay Area Conservancy Program.
6. **Need:** If Conservancy funds were unavailable for the PAHLP project, the remaining project phases would be susceptible to the City’s competing funding challenges, and could be significantly postponed or forgone. With the SAFER bay flood-control project underway, supporting this project is an opportunity to demonstrate the importance and viability of integrating nature-based solutions with traditional grey infrastructure. In the extreme, without SCC funding, this opportunity would be lost, as well as important environmental and social benefits.

7. **Greater-than-local interest:** The outcomes of this pilot project and collaboration with SFEP's Transforming Shorelines Collaborative could make the project a model of integrating nature-based and grey solutions for reproduction at other wastewater treatment discharge sites along the Bay, particularly along the SAFER Bay project levee alignment.
8. **Sea level rise vulnerability:** Once implemented the project will support sea-level rise adaptation by providing a vegetated slope that will support freshwater plants to build organic soils and allow wetland habitat to migrate upslope with rising water levels. The project would implement the City's newly adopted Sea Level Rise Adaptation Policy, and protect the RWQCP in particular from sea level rise impacts.

#### **Additional Criteria**

9. **Urgency:** A recently completed report assessing sea-level rise vulnerability in the Palo Alto Baylands found that if the PAHLP and other similar projects aren't implemented, widespread inundation and levee overtopping can be expected at around 36 inches of sea level rise, which is predicted between 2050 and 2100. In addition, the Baylands Ecosystem Habitat Goals Science Update 2015 recommends accelerating restoration of complete baylands ecosystems by 2030. Nature-based solutions should be established to maintain and restore wetlands before sea-level rise threats force stakeholders to resort to shoreline hardening.
10. **Resolution of more than one issue:** The project will enhance wildlife habitat and water quality, improve flood capacity, and incorporate public access features.
11. **Leverage:** See the "Project Financing" section above.
12. **Innovation:** The PAHLP will be designed based on the scientific findings and results of the Oro Loma Experimental Horizontal Levee. The Oro Loma project is an outdoor living laboratory studied by researchers from the University of California, Berkeley, and the ongoing monitoring of this project site is part of a long-term partnership between SFEP, Oro Loma Sanitary District, and scientists and engineers from across the region. While Oro Loma is a closed, experimental system, PAHLP builds on results from the project to create a system that opens to the Bay, while prioritizing habitat restoration as its primary function. The scientific results are driving the design of the PAHLP project, making it consistent with best available science. The newly formed Transforming Shorelines Collaborative with interdisciplinary experts will review the project to ensure it maximizes stated project benefits and is scientifically rigorous.
13. **Vulnerability from climate change impacts other than sea-level rise:** Irrigation of the horizontal levee using treated wastewater makes the PAHLP project susceptible to upstream impacts in the sewer system from drought. During the last California drought (2012 - 2016) the RWQCP experienced a significant decrease in incoming wastewater flows due in large part to water conservation efforts in the service area. Consequently, the amount of treated wastewater available to irrigate the PAHLP project could be significantly reduced if prolonged drought causes the RWQCP to experience extreme low flows and

competing needs for the treated wastewater, such as water recycling. The planning process will consider this in developing project designs.

**CONSISTENCY WITH SAN FRANCISCO BAY PLAN:**

The proposed project is consistent with the San Francisco Bay Conservation and Development Commission's Bay Plan, specifically with Water Quality policy 7, of providing native vegetation buffer areas to control pollutants from entering the Bay (p 19), and Climate Change policies 4-5 that encourage habitat enhancement of undeveloped areas vulnerable to flooding, using shoreline protection measures that incorporate natural Bay habitat, innovative approaches to sea-level rise adaptation (pp 32-37). The Bay Plan calls out a regional restoration goal for the South Bay of restoring natural transitions from marsh to upland habitats wherever possible (Plan Map 6).

**CEQA COMPLIANCE:**

The proposed project is statutorily exempt from the provisions of CEQA under 14 Cal Code of Regulations Section 15262 because the project will only involve preparation of planning studies for possible future actions that have not yet been approved, adopted or funded. The planning studies will consider environmental factors. In addition, the proposed project is categorically exempt from CEQA pursuant to 14 Cal Code of Regulations Section 15306, which exempts basic data collection and resource evaluation activities that do not result in a serious or major disturbance to an environmental resource.

Upon approval of the project, Conservancy staff will file a Notice of Exemption.