

**TO:** PARKS AND RECREATION COMMISSION

**FROM:** DAREN ANDERSON

**DEPARTMENT:** COMMUNITY SERVICES

**DATE:** AUGUST 24, 2021

**SUBJECT:** PARK IMPROVEMENT ORDINANCE FOR THE IMPROVEMENTS TO THE PALO ALTO FLOOD BASIN TIDE GATE STRUCTURE AS PART OF THE PALO ALTO FLOOD BASIN TIDE STRUCTURE REPLACEMENT PROJECT.

**RECOMMENDATION**

Staff recommends that the Parks and Recreation Commission (Commission) recommend that Council adopt and approve a Park Improvement Ordinance (Attachment A) authorizing Santa Clara Valley Water District's (Valley Water) Palo Alto Flood Basin Tide Gate Structure Replacement Project (Project), which will construct a new replacement tide gate structure (Structure). Plan sheets showing the in-progress design and planned temporary trail closures are included in Attachment A.

**BACKGROUND**

The levees forming the Palo Alto Flood Basin (Flood Basin) were built by the City of Palo Alto (City) in the 1940s and the associated tide gate structure (Structure) was constructed in 1957 by the former Santa Clara County Flood Control and Water Conservation District (now Santa Clara Valley Water District, also known as Valley Water), Santa Clara County and the City. The Structure is located along the Bay shoreline in the City, east of the Palo Alto Municipal Airport and Palo Alto Baylands Nature Preserve. The floodwaters stored in the Flood Basin are released to the Bay through eight cells with 16 tide gates (15 passive gates and one motorized sluice gate) that comprise the overall tide gate structure. The purpose of the passive tide gates is to regulate water elevation in the Flood Basin such that when the water elevation in the basin is higher than the tidal elevation of the Bay, the passive tide gates are pushed open by water pressure and discharge water from the Flood Basin to the Bay. When the water surface elevation in the Flood Basin is lower than the Bay, the passive tide gates are held shut by water pressure from the Bay, to prevent full tidal inundation.

In 1977, the City requested to change one of the passive tide gates to a motorized sluice gate for a mitigation project agreed to by the United States Army Corps of Engineers and the City for the Palo Alto Refuse Disposal Area. In 1978, the City forwarded the plans and specifications for the gate modification and Valley Water issued a permit to the City for the gate modification. The City operates the motorized sluice gate to improve water quality within the Flood Basin while considering optimal Flood Basin water elevation.

The Structure has been regularly inspected and maintained by Valley Water. In 2011, Valley Water discovered that water was flowing beneath the Structure, undermining the function of the tide gates and potentially its structural stability. In 2012, Valley Water completed emergency repairs to stop

seepage flow beneath the Structure. As part of that effort, staff prepared a post construction report (as required by the United States Army Corps of Engineers' Emergency Permit) which detailed the emergency work and recommended replacement of the Structure.

In 2014, Valley Water retained the services of Mark Thomas & Company (MT) to perform structural inspections and prepare an assessment report for the Structure. The report concluded that the Structure was generally in fair condition and recommended minor structural repairs.

In 2017, Valley Water retained a construction contractor to perform minor repairs. The work was complicated due to cracks found in the bottom slab and inability to dewater for the repair work, which resulted in the contract being terminated without completing the work. Subsequently, a structural assessment was performed by MT in October 2017 which concluded that the structure would be functional for a couple more years and recommended the Structure be replaced.

In 2018, after project objectives were changed to replace (rather than repair) the Structure, a new team was assigned to the Project to commence planning and design of the new Structure. The new Project team also prepared an Emergency Action Plan in coordination with the City of Palo Alto in 2019 to provide guidance for potential flooding emergencies in the interim. MT was engaged to perform additional structural assessments in January 2020 and January 2021, and both assessments concluded that the Structure would still be good for another couple of years.

### Project Description

The Project objectives include the following:

- Prevent failure of the existing Structure, which would result in increased risk of coastal and fluvial flooding;
- Maintain or improve the level of flood protection for Matadero, Adobe, and Barron Creeks, including during Project construction;
- Construct a new motorized sluice gate on the City's behalf which will be used to maintain or improve water quality within the Flood Basin; and
- Upsize the Structure to function with two feet of future sea-level rise.

The Project would involve construction of a new 132-foot-long tide gate structure slightly inboard (upstream) and southeast of the existing 113-foot-long deteriorating Structure, removal of the existing Structure and levee, and construction of a new levee that ties into the new tide gate structure. The Project would be divided in to two phases and constructed in four seasons. The existing Structure would continue to function until the new structure is completed by the end of second phase. Phase 1 would involve installation of the first dewatering system; construction of the new tide gate structure and east levee transition; and removal of the existing levee in front of the new structure. Phase 2 would involve installation of the second dewatering system; construction of the west levee transition; and removal of the existing Structure.

The Project would construct a new motorized sluice gate with Supervisory Control And Data Acquisition (SCADA) system and water elevation sensors which would be monitored and operated by the City and used to maintain or improve water quality within the Flood Basin. The existing sluice

gate constructed in 1978 is now over 40 years old and shows aging. Some of the basic operations such as closing the gate must be done by manual physical cranking rather than use of the motor. Similarly, the existing SCADA system cannot currently be used to automate opening and closing of the sluice gate. The new sluice gate infrastructure would remove the existing City owned sluice gate and replace with a new City owned sluice gate and SCADA system integrated with the replacement tide gate Structure.

#### Maintenance of the Site:

Maintenance of the City's sluice gate should be improved with the new Structure which will improve on the existing conditions by installing trash racks on both the San Francisco Bay (Bay) side as well as the Flood Basin side. The existing sluice gate only has a trash rack on the Flood Basin side. When the sluice gate is opened, water from the Bay enters into the Flood Basin through the sluice gate. The incorporation of the additional trash rack on Bay side of the sluice gate should reduce the risk of debris interference and subsequential potential damage to the sluice gate system.

Similar to current operations, the City will monitor, operate, and maintain the sluice gate, water elevation sensors, communication control system related to sluice gate, and SCADA. Similar to current operations, Valley Water staff would continue to support debris removal from the trash racks and/or tide gates as needed.

#### Planning Review

Valley Water is the lead agency for this Project and has performed and completed the Planning Phase of the Project.

#### **DISCUSSION**

City of Palo Alto staff and Valley Water staff have been working together on this partner Project since 2018. This project replaces critical flood, environmental, and recreational infrastructure critical to the City, Valley Water, wildlife, and the public. This project will replace the aging tide gate Structure and sluice gate system.

The Project will require temporary closures to portions of the Trail to accommodate construction of the replacement Structure work. A diagram illustrating anticipated Trail closures is included in Attachment A. If the replacement Structure is not constructed, future degradation of the existing Structure will occur and would eventually require closure of the Trail for an unknown duration of time.

The replacement Structure will include a dedicated concrete bay with motor driven sluice gate solely for the City's use of maintaining water quality within the PAFB and controlling mosquito breeding. This new motor operated sluice gate will replace the existing motor operated sluice gate which is owned and operated by the City. The Structure will also include new water level sensors and SCADA system to improve flexibility and efficiency for the City's sluice gate operations. The new sluice gate will enable remote operation of the sluice gate.

The replacement Structure with its improved operations and maintenance features and improved

hydraulic performance is anticipated to reduce mosquito breeding within the PAFB compared to the existing conditions.

On June 22, 2021, the Parks and Recreation Commission reviewed and voted (7:0) to recommend that City Council adopt a Park Improvement Ordinance for the improvements to the Palo Alto Flood Basin Tide Gate structure ([Staff Report](#)). On July 10, 2021, Valley Water informed City staff that improvements to the existing levee trail surface, which was part of the project and included in the Park Improvement Ordinance, was going to be removed from the scope of work. Because of this change in the scope of the project, the Park Improvement Ordinance has been updated and will be reviewed again by the Parks and Recreation Commission.

The proposed trail improvements were intended to smoothen, strengthen, and provide an all-weather trail surface for the contractor to use during construction, and would have been installed by Valley Water's Operations & Maintenance staff. However, the outlook for starting the trail improvement work as planned has been impacted by the need for more time to acquire regulatory permits to perform the trail work. It was questionable if the full stretch of trail improvements could be completed within the full three month period, and with a delayed start, it was becoming even more unlikely. Not completing the entire trail work would reduce the benefits to the contractor. As a result, Valley Water has re-assessed the need for the proposed trail improvements and this work has been cancelled. In lieu of this work, the contractor will be required to adhere to additional specification provisions during the Project's construction season.

While the previously proposed trail improvement work was intended to improve the ability for the existing levees to facilitate construction equipment loading, it would not have fully eliminated the risk of possible trail surface damage or levee damage. Although omission of the proposed trail surface improvement work comes with increased risk that the levee may require repairs, the planned duration of construction remains unchanged at four years. In lieu of the proposed trail improvements, the contractor will be required to perform in-kind repairs to the levee, if necessary, during the normal work seasons. To minimize levee repairs, the contractor will have to find the optimum balance between truck load size and number of truck trips to reduced potential levee damage that could occur with heavier truck loading. Another restriction similarly applied to the South Bay Salt Pond berms that are utilized by haul trucks, is that use of haul trucks on the berms is limited following significant rain events to prevent damage to the berms. Valley Water will use a similar provision to minimize the risk of levee damage. The project specifications will also require that the contractor repair the trail surface to the satisfaction of Valley Water and the City of Palo Alto at the end of each construction season, prior to opening to trail users. Additionally, at the completion of the project, the contractor will be required to provide a final trail surface that meets or exceeds the pre-construction conditions.

Lastly, not installing the trail improvement work also eliminates temporarily closing the trail for at least three months this year and eliminates the public from having to use a potentially unfavorable all-weather aggregate base trail surface.

## **RESOURCE IMPACT**

Valley Water has requested cost sharing for specific project elements. The City and Valley Water are working together on cost sharing discussions. Post-construction operations and maintenance costs are expected to be reduced compared to existing conditions.

## **ENVIRONMENTAL ASSESSMENT**

Valley Water is the lead agency under California Environmental Quality Act (CEQA). The CEQA Final Mitigated Negative Declaration is available at the Valley Water Project website: <https://www.valleywater.org/pafbidegates>.

## **TIMELINE**

September/October 2021: Park Improvement Ordinance to Council

October 2021: Second Council reading

September 2022\*: Start of Year 1 (Season 1) Construction

September 2023\*: Start of Year 2 (Season 2) Construction

September 2024\*: Start of Year 3 (Season 3) Construction

September 2025\*: Start of Year 4 (Season 4) Construction

*\*All dates above are tentative target dates subject to change pending project development, acquisition of all required regulatory permits, construction permits, etc.*

## **ATTACHMENTS**

Attachment A: Park Improvement Ordinance