Flood Control Zone 7 Santa Venetia Newsletter

March 2, 2018 **Volume 1, Number 1**

In This Update

Update on non-District Programs

The following are updates on non-Zone 7 programs that may be of interest to Santa Venetia.

Marin County & San Rafael Airport MOU

The County is negotiating a Memorandum of Understanding (MOU) with the San Rafael Airport to address three issues:

- Resolution of conflicting boundary information
- Long-term maintenance for the levees surrounding Airport
- Planning for future restoration of the land east of the runway

The document also outlines an interim plan for maintaining portions of the levees and channel along Gallinas Creek.

Public Input: The County is considering comments received in writing and at a well-attended public meeting held in November. This includes working with a transportation consultant to clarify opportunities for wetland restoration and levee setback on existing State Tidelands granted to the County of Marin in the vicinity of the end of the San Rafael Airport runway, given any applicable state and federal safety regulations. This would be concluded prior to execution of the MOU.

The County Board of Supervisors will be considering the MOU at a future meeting date that has not yet been set. A community meeting will be held prior to the County Board of Supervisors meeting date.

View the draft MOU as presented in November (updates pending) and related information at the following website:
https://www.marincounty.org/depts/pw/divisions/projects/land-use/srairport

Contact Us

http://www.marinwatersheds.org

General Zone 7 Inquiries:

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Engineering Assistant

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Road Drainage Inquiries:

Civic Center Yard Service Center

Public Works - Roads

415-446-7388

Emergencies:

Sheriff's Communication Center

9-1-1 (emergencies)

415-479-2311 (non-emergencies)

Lower Gallinas Creek Alternative Futures Webpage:

http://www.sfbaynerr.org/coastal-training/past-events/facing-alternative-futures-for-lower-gallinas-creek/

Community Rating System (CRS) Program

The Community Rating System (CRS) is a voluntary program for National Flood Insurance Program (NFIP) participating communities. The goals of the CRS program are to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. The County entered into the CRS program for the unincorporated communities in order to earn its property owners flood insurance premium discounts for the County's implementation of floodplain management practices that exceed the minimum requirements of the NFIP. The County was initially rated as Class 7, but has been working with FEMA to move to class 6, increasing the discount to property owners from 15% to 20%. This increased discount will take effect when individual policies renew after May 2018. The Flood Control District encourages unincorporated area property owners to ask their insurers to prove that they received the CRS discount of 20%. For reference, the NFIP community identification number in Marin County is 06041C.

The following cities and towns are participants:

Jurisdiction	CRS Rating	Insurance Discount	CRS Program Entry Date
County of Marin	6 (effective 5/1/2018)	20%	5/1/2016
Corte Madera	7	15%	10/1/2003
Novato	6	20%	10/1/1995
San Anselmo	9	5%	5/1/2016
Ross	8	10%	5/1/2015
Fairfax	10	0%	N/A
Sausalito	10	0%	N/A
Belvedere	10	0%	N/A
Larkspur	10	0%	N/A
San Rafael	10	0%	N/A
Mill Valley	10	0%	N/A
Tiburon	10	0%	N/A

Facing Alternative Futures for Lower Gallinas Creek

A resource page (see sidebar) has been set up by the San Francisco Bay National Estuarine Research Reserve following its October 19, 2017 symposium titled Facing Alternative Futures for Lower Gallinas Creek, which included talks on sea level rise and restoration opportunities in lower Gallinas Creek.

BayWAVE Sea Level Rise Vulnerability Assessment

The vulnerability assessment is an informational document that catalogs impacts with six different sea level rise

Number of Santa Venetia Parcels Vulnerable by Sea Level Rise Scenario:

Scenario	Height of Rise	Number parcels at risk
1 (year 2030)	10 inches	4* (<1%)
2 (year 2030)	10 inches+ 100-year storm surge	604 (36%)
3 (year 2050)	20 inches	4* (<1%)
4 (year 2050)	20 inches+ 100-year storm surge	652 (39%)
5 (year 2100)	60 inches	653 (39%)
6 (year 2100)	60 inches +100-year storm surge	821 (49%)

**Assumes Zone 7 levees, pump stations, and storm drains are fully operational; levees do not fail before overtopping; elevation of the land does not change; and massive ice sheets of Antarctica don't melt which would nearly double prior estimates of sea level rise which considered a minimal contribution from Antarctica. Note: Kleinfelder's 2013 levee analysis report predicted an 80% chance of levee failure before Gallinas Creek water levels reach the levee top. Additionally, Kleinfelder predicted that the land will settle about 3 to 4 inches every 10 years for the next several decades. Therefore actual numbers of vulnerable parcels may be higher.*

scenarios across the entire bay shoreline. The best available science was used to complete the report with a range of projections including those that we already face with high tides and storms. Certain areas of Marin already deal with flooding on a regular basis and this report demonstrates the impacts across jurisdictional boundaries and along our shared resources, utilities, and infrastructure. Summary of the results for Santa Venetia is to the left in the blue sidebar. The Unincorporated Community Profiles document and the remainder of the report can be accessed on this website: https://www.marincounty.org/main/baywave/vulnerability-assessment

McInnis Marsh Restoration Project

In January of this year Marin County Parks commenced preparation of plans and specifications for the McInnis Marsh Restoration Project. This effort will ultimately provide complete plans and specifications needed to construct the project in 2021, and prior to that to provide the information needed to evaluate environmental impacts of the project. Included in the scope of this effort is hydraulic modeling and analysis of any potential for flood and erosion impacts to the adjacent areas, including the Santa Venetia community levees. Project website: https://www.marincountyparks.org/depts/pk/our-work/parks-main-projects/mcinnis-marsh-restoration

Zone Activities Report

The following are updates on Zone 7 activities that do not currently require action by the Advisory Board.

Zone Staffing Changes

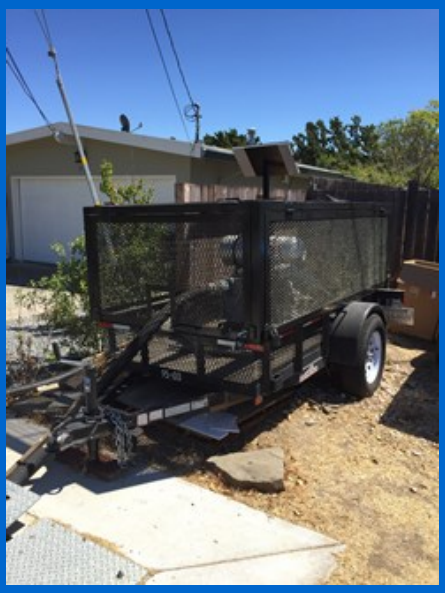
Former Zone Engineer Jon Liang accepted a new assignment with the Engineering Division of the Marin County Department of Public Works last summer. While he still works for the County, he is no longer available to help in Zone 7. Recruitment of a replacement Zone Coordinator is in progress and a new Zone contact is expected to be in place in this coming spring. Following successful recruitment a Zone 7 advisory board meeting will be scheduled in the April to June timeframe. In the meantime, zone-related communications can be routed through Hannah Lee at *hlee@marincounty.org* or 415-473-2671.

2017 Storm Damage Funding

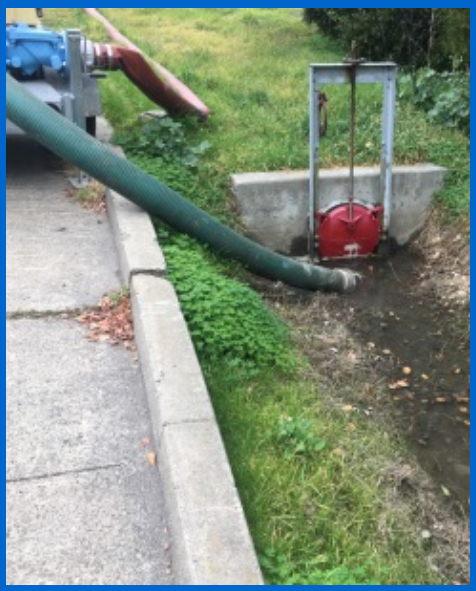
Staff has worked closely with FEMA representatives over the last year to pursue reimbursement of disaster response costs from the 2017 declarations of Major Federal Disasters

due to winter storms. During the disaster last winter water seeped through the levee at two known locations along Vendola Drive. FEMA has reimbursed $3,344.53 for Zone 7 response costs, which included sandbagging.

Prior portable pump when it was on Estancia Way in 2016:



Prior portable pump and ditch at end of Meadow Drive in 2018:



Portable Pumping Systems Changes

Prior to 2013 two pumps were staged on Estancia Way, one between 866 and 870 Estancia Way, and one at the end of the road near the levee toe drain. These pumps were turned on and off by staff when the street storm drain and levee toe drain system were overwhelmed. The pump between 866 and 870 Estancia Way had its intake hose in a catch basin in the road, which had the unfortunate effect of reducing the effectiveness of the street drains and was prone to clogging with leaves.

Changes in 2013: A new automatic portable pump was provided to Zone 7 in 2013 for use between 866 and 870 Estancia Way by the County of Marin in response to a request from a resident who has since moved away. A small sump was also built at that time outside of the roadway, which now allows for normal function of the street drainage system when the pump intake is in place. The sump itself is a significant benefit to the drainage system, and even appears to eliminate the need for the second pump at the end of Estancia Way (this will continue to be evaluated in the field). However, the sump is also prone to being clogged with leaves, with high costs (last invoice exceeded $1,500) associated with cleaning the sump in order to continue to function as intended.

Changes in 2018: Although the intent was to reduce the need for maintenance staff attention for operation purposes, the maintenance needs have been great, and the noise generated complaints in such close proximity to living areas. Staff replaced the automatic pump with the prior non-automatic pump to reduce the noise and the maintenance needs associated with its automatic capabilities.

The automatic pump was relocated to Meadow Drive across from Santa Margarita Island with the automatic functions turned off. Its pumping capacity is well-suited for draining rainwater in the roadside ditch there at high tides. The slightly larger pump, which had historically been staged at Meadow Drive for this purpose, is now available to be deployed where needed in emergencies.

Pump Station No. 2 Portable Generator Receptacle Project: The District is currently working with the Las Gallinas Valley Sanitary District (LGVSD) to share the cost to

relocate the fence around the property to make room for recent site and equipment improvements related to utilizing a portable generator, and to protect the site. LGVSD has collected survey data, but costs for this work have not yet been identified.

Las Gallinas Levee Evaluation Termination Letter Webpage:
http://www.marinwatersheds.org/resources/publications-reports/las-gallinas-creek-levee-evaluation-reports-and-documents

Las Gallinas Creek Levee Evaluation Termination: The U.S. Army Corps of Engineers (USACE) completed technical and economic analysis of the Las Gallinas Creek (Zone 7) levees in January 2014. Despite potential levee projects identified through this effort, USACE would not be able to provide funding. USACE sent the District a letter (see sidebar) in September 2017 that further explains the reasoning for current lack of federal interest in a project to improve these levees.

FEMA Hazard Mitigation Funding

To alleviate the federal costs of disasters, Congress amended the 1974 Disaster Relief Act in 1988 to provide federal assistance to mitigate the impacts from future disasters. Under this amendment, a certain proportion of federal assistance money coming into the state must be invested in the form of hazard mitigation projects through the Hazard Mitigation Grant Program (HMGP). This means whenever the President declares a Major Disaster in California, staff expects a new round of FEMA HMGP funding will become available.

Understanding the Hazard Mitigation Grant Program as an Individual in a Community:
https://www.fema.gov/understanding-hazard-mitigation-grant-program-individual

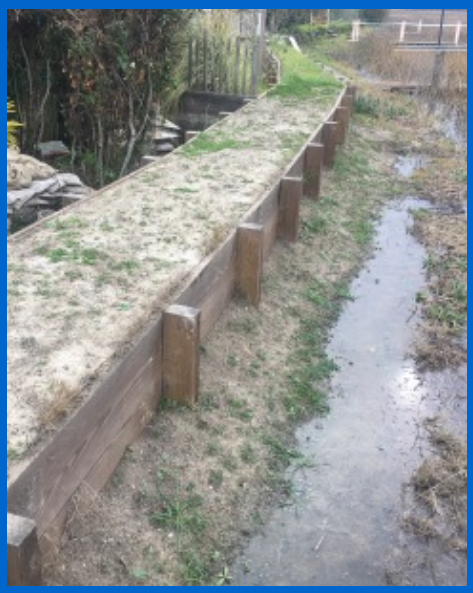
Zone 7 Grants: On behalf of Zone 7 the District has submitted grant applications to the California Office of Emergency Services (Cal OES), which administers this funding for FEMA in this state, in response to available funding following fires in 2015 and floods in 2017. One of these grant requests was denied, and that application was re-scoped and resubmitted in response to FEMA's reasons for denial.

Future Opportunities: Given relatively frequent and disastrous floods and wildfires in California, additional grant rounds are anticipated over the coming years. In the future the Zone may consider applying, if a 25% local match can be identified, to improve Pump Station No. 4 and the Meadow Drive Interceptor Drain, projects which were identified in the Gallinas Watershed Program's Santa Venetia Storm Drain Hydraulic Study. This type of funding is uniquely suited for the Zone's single-benefit needs (in other words, few opportunities for habitat or water supply/quality improvements are associated with the zone's greatest flood risk reduction needs).

FEMA Homeowner's Guide to Retrofitting

https://www.fema.gov/media-library/assets/documents/480

Existing Timber-Reinforced Berm:



Las Gallinas Levee Evaluation Webpage:
http://www.marinwatersheds.org/resources/publications-reports/las-gallinas-creek-levee-evaluation-reports-and-documents

Following is a summary of project/program status for currently active applications:

Marin County Structure Elevation Program: The Marin County Structure Elevation Program is a proposed grant program whereby individual homeowners can raise their homes above the FEMA base flood elevation with 75% of their eligible costs reimbursed by the federal government. An application for this project was submitted in June 2016, and staff are currently collecting additional information for FEMA's environmental and historic review which is expected to be completed within the next year. This initial grant is likely to be awarded to 16 homeowners across the county (2 in Santa Venetia), and depending on the outcome, the program may be continued in the future.

Timber-Reinforced Berm Improvement Project: In November 2017 staff submitted an application for a Timber-Reinforced Berm (TRB) Improvement Project which would cover the entire length of the facility behind properties along Vendola Drive. The prior grant submittal was only spot improvements at 13 sites and was rejected by FEMA because the proposal left the rest of the system vulnerable to flooding. This re-scoped, comprehensive project directly addresses FEMA's concerns. This project to improve the level of protection of the levee system is a high priority following the Marin County Watershed Program studies and the Las Gallinas Creek Levee Evaluation.

Project Background: Historically, Santa Venetia was a tidal marsh adjacent to Las Gallinas Creek that was built by the developer. In the early 1900s the site began to be filled for development for residential use and construction of homes continued through last century. The marsh soils underlying the community compressed due to the added load, causing the community to sink below sea level.

Currently, about 900 homes are protected by a levee system along Las Gallinas Creek. Most of the levee is located behind homes along Vendola Drive (5 Vendola to 825 Vendola). The elevation of the existing earthen levee system ranges from Elevation 8.1 to 10.4 (NAVD88). Atop the earthen levee system are soil-filled redwood boxes (known as timber-reinforced berms, or TRBs) that are founded on top of the earthen levee system to provide an increased measure of protection to the Santa Venetia community as the levees themselves settled. The timber-reinforced berms were originally constructed in 1983 and have been upgraded and maintained, as funding allows,

Response to Prior Questions Regarding TRB Improvement Project:

A question was brought up at the last advisory board meeting regarding section F.3.4 Flood Risk Reduction Closeout of the February 27, 2015 FEMA Hazard Mitigation Assistance Guidance Addendum which stated:"…the Recipient must provide to FEMA documentation of flood insurance for the elevated structure and a copy of the recorded deed amendment." FEMA has confirmed that this statement is misplaced and was meant to apply to home elevations and not localized flood risk reduction projects. Property owners adjacent to the TRB would not be required to have flood insurance or a deed restriction.

Another question was related to whether property or easement acquisition is required for this project. Acquisition of permanent right-of-way may be an eligible expense assuming the benefit outweighs the cost, and can facilitate ongoing maintenance. From FEMA's perspective it is not a requirement to acquire permanent right-of-way for program funding. The application submitted (including the current project cost estimate) assumes the use of the existing rights-to-enter system for construction and ongoing maintenance. This can be modified as the project develops. Staff are working with Counsel regarding long-term options.

since that time. Aside from those who live immediately adjacent to the berms, and any others with boat access along Las Gallinas Creek, the TRBs have relatively low visibility considering how critical they are for the community as a whole.

Existing TRB Components: The existing TRBs consist of two vertical panels of wood separated approximately 3 feet from each other that run parallel to the levee crest. The panels are fastened to wooden posts that extend into the levee about 2-4 feet deep. The area between the two wood panels is filled with special soils.

Existing TRB Conditions: Details of the existing TRB were presented in Kleinfelder's report on the evaluation of the Las Gallinas Levee System dated July 3, 2013 (see sidebar). Currently, the existing TRBs show signs of aging and low top of berm elevations due to settlement of the levee system. Some sections of the TRBs are slightly lower than the design water surface elevation (WSE) which is equal to the existing FEMA-determined 100-year flood elevation. In some areas these TRBs do not meet the 10-year flood WSE plus 1-foot of freeboard. However, failure of the TRB is likely to occur before water levels overtop it. The wood used in the existing TRB should be replaced every 10-20 years and some sections are now 35 years old.

Scope of Project: Kleinfelder recommends replacing the TRB with a more robust system. The proposed retrofit will be designed to increase the longevity of the TRB by using composite lumber materials and by increasing the height of the replaced TRB to protect against at least the 100-year (FEMA) WSE.

The retrofit TRBs will occupy a similar location to the existing TRBs. A small number of locations that currently do not have TRBs will have TRBs constructed on the existing levee. The depth of proposed post embedment of up to 7.75 feet is greater than the existing wooden TRB embedment depth, and will reduce seepage and increase resistance to failure. The posts and panels will be composed of composite lumber material instead of wood. Composite lumber materials are highly resistant to decay, rot and pest infestation. The typical design life of composite lumber materials is 50-years, and they require minimal cleaning and maintenance (compared to a 20 year design life for wooden lumber material).

Project Goal: The goal of the project is to provide protection to Zone 7 from flooding from the 100-year still-water tide elevation until 2050. The design elevation of the

improved TRB would be 12.5 feet NAVD88 datum. The current FEMA-determined 100-year still-water tide elevation is 9.8 feet NAVD88. Given BayWAVE predictions of 20 inches of sea level rise and Kleinfelder projections of about 12 inches of levee subsidence, both the TRB top and 100-year flood elevation are estimated to be 11.5 feet NAVD88 by 2050. Longer-term sea level rise adaptation planning for Santa Venetia should occur before 2050 and consider the effect of already high - and rising - infrastructure costs.

Project Cost Estimate: The overall project cost is estimated to be $4 million including a $1 million local match requirement.

The Proposed Project Budget:

- $3,000,000 Federal Share (FEMA)
- $1,000,000 Required Local Share (Flood Control Zone 7)
- $4,000,000 Total (75% FEMA, 25% Zone 7)

The project cost must be fronted by the Zone with a total reimbursement of up to $3 million coming from FEMA. The current Zone 7 fund balance is about $475,000 and revenue is close to $400,000 annually. Given that Zone 7 does not have the $1 million required local match currently in its fund, nor adequate funds to front the project construction costs, District staff are investigating potential options to meet the cash flow needs and local match requirement of the Timber-Reinforced Berm Improvement Project. The grant has a 3-year performance period. See potential project cash flow needs in blue sidebar to the left.

Potential TRB Improvement Project Cash Flow:

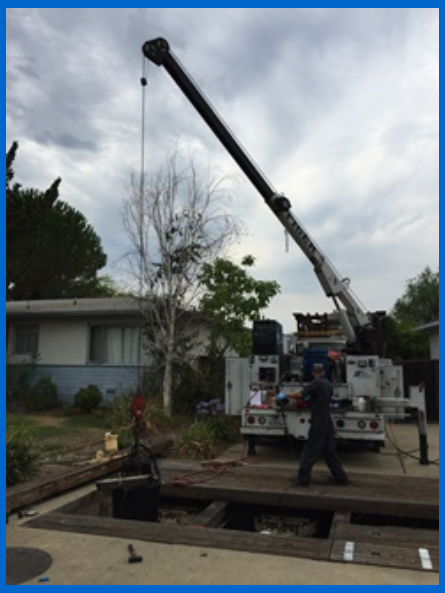
Year 1 – Estimated cost $300,000 to finalize design and obtain any necessary permits and environmental review.

Year 2 – Estimated cost $1.8 million during first phase of construction. Receive up to $225,000 in reimbursed funds from last year from FEMA.

Year 3 – Estimated cost $1.9 million during second phase of construction and closeout. Receive up to $1.35 million in reimbursed funds from last year from FEMA.

Pump Station No. 1 Sump Pump

Removal of pump with crane



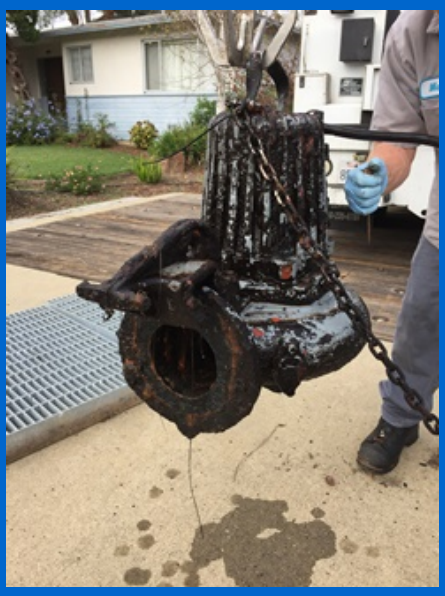
Annual and Preventive Maintenance

The District follows an annual program of facility and creek maintenance which mitigates the risk of flooding. This maintenance includes conducting regular inspections of the creeks, floodwalls, and levees within the District's jurisdiction, and frequent testing of pumps, motors, and generators. Creeks, drainage ditches, pipes, trash racks, and pump wet wells are cleared of vegetation, sediment, and trash in the fall and throughout the winter as needed. A facility-specific update regarding maintenance, storm preparedness and response is provided below:

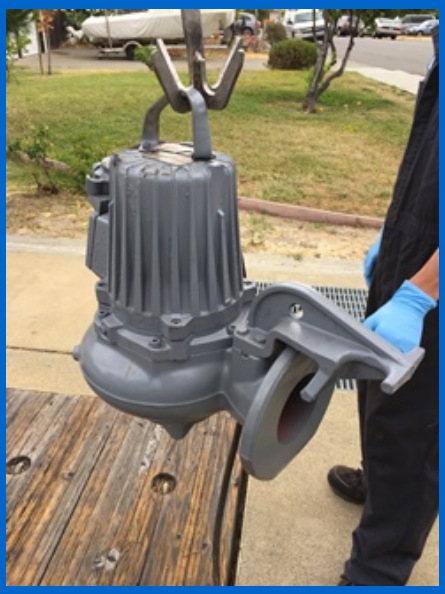
Pump Station Maintenance: All scheduled annual pump preventive maintenance for 2017 has been completed. Each year before the rainy season as part of an overall preventive maintenance program, the pump station's electrical components are tested and the engines are maintained as well. The generators are load tested every 3 years and only

Pump Station No. 1 Sump Pump Refurbishment

Before:



After:



the results of Pump Station #2 were of concern (therefore the receptacle for the County's portable generator was installed as a back-up). In addition to electrical checks, the wet wells are inspected and cleaned. The State's Water Quality Order No. 2013-0001-DWQ National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004 Waste Discharge Requirements (WDR) for Storm Water Discharges From Small Municipal Separate Storm Sewer Systems (MS4s) (General Permit), also called "Phase II Permit," now requires cleaning wet wells at least once per year. As this used to be completed only on an as-needed basis following inspection, maintenance costs are expected to increase by several thousand dollars per year.

Safety: Another factor that increases pump station and underground drainage/storage system maintenance costs is compliance with confined space policies. Confined space requirements, such as procedures and signage, are in the process of being updated. Both contracting costs and staff time are expected to increase.

In addition to annual preventive maintenance, long-term/major maintenance is performed for select pumps and electric motors. (Individual pumps and motors are scheduled for major maintenance on a six year interval.) A summary of last year's work and this year's plan is below.

2017 Pump Station Maintenance Summary

SV 1 Pump Station: preventive maintenance was performed in summer of 2017. One of the soft starters failed this year and had to be replaced for approximately $5,000. The sump pump, which does most of the day-to-day pumping in this pump station, had to be completely refurbished for a cost of $9,300. Staff are exploring options for different summer pump on/off set points in order to reduce the wear and tear on the pump due to groundwater and other non-stormwater flows.

SV 4 Pump Station: preventive maintenance was performed in summer of 2017 on pump #1 for a cost of $7,422. The wet well ladder bottom has corroded away and needs to be replaced this year for an anticipated cost of about $2,200. It was also identified that the trash rack at the wet well intake has corroded an unacceptably large hole. Additionally, cattails were found growing inside the trash rack. Temporary bars were put in front of the rack until summer and until costs for permanent repairs are determined. Also, corrosion around the pump discharge is causing pumped storm water to spill out

adjacent to the pump station building. Costs for sealing off the spill are being investigated.

SV 5 Pump Station: preventive maintenance was performed in summer of 2017 on pump #1, and additional repair was needed. The cost for this maintenance was $33,543. Pumps #2 and #3 are similar so therefore similar problems are expected this summer when their maintenance check-up is due. In addition to larger than normal pump maintenance costs, the pump station generator's transfer switch malfunctioned this winter and its controls need to be replaced for an estimated cost of $7,000.

2018 Pump Station Maintenance Plan

SV 4 Pump Station: Pump #2 will be removed for major preventive maintenance. Its condition may be similar to that of pump #1 which required extra work last year. Estimated cost for pump work is $7,000-8,000. Quotes have not been received, but work on the trash rack and discharge pipes could exceed $10,000.

SV 5 Pump Station: Pumps #2 and #3 will be removed for major preventive maintenance. Normal maintenance is usually about $25,000 per pump ($50,000 total) in contract costs, but given the extensive needs last year for pump #1, costs could exceed $60,000.

Vegetation Maintenance: Vegetation maintenance is performed within existing easements held by the District throughout all Flood Control Zones. The work is typically completed by October 15 each year and the goals include both fire fuel reduction and maximizing stormwater flow capacity. Ditches maintained in Zone 7 include: the one between Birch and Mabry Way, Santa Venetia Marsh Levee toe drain ("Estancia Ditch"), and Castro Ditch.

Permitting: The District's vegetation maintenance program is permitted through a Routine Maintenance Agreement with the CA Department of Fish and Wildlife (DFW) and a WDR Order from the Regional Water Quality Control Board. Although this programmatic permitting process was intended to streamline maintenance, permit compliance requires mitigation; pre-project assessments, notifications, and surveys; data collection during implementation; post-project reporting; data management; and continuous revisions to the District's Stream Maintenance Manual. A key finding of a California State Auditor Report from March 2018

District's Stream Maintenance Manual:

http://www.marinwatersheds.org/resources/publications-reports/marin-county-stream-maintenance-manual

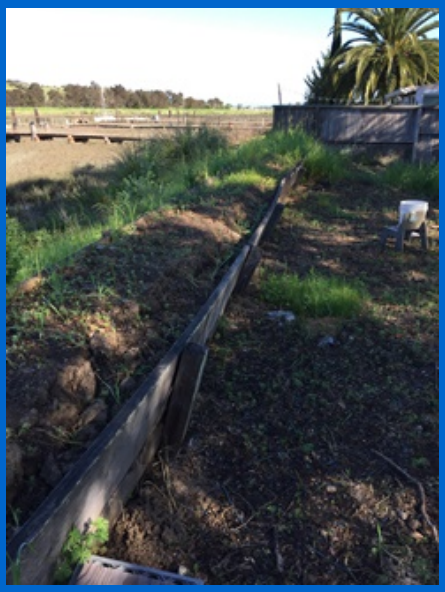
California State Auditor Website including the State and Regional Water Boards Report 2017-118:

https://www.auditor.ca.gov/

State and Regional Water Boards They Must Do More to Ensure That Local Jurisdictions' Costs to Reduce Storm Water Pollution Are Necessary and Appropriate

A Timber Reinforced Berm Section repaired in 2017

Before:



After:

As a reminder, property owners with TRBs should coordinate landscaping efforts adjacent to the levee with the District.

regarding State and Regional Water Boards included that regional boards have not adequately considered the overall costs that local jurisdictions would incur to implement pollution control requirements they impose.

Timber-Reinforced Berm Maintenance & Rodent Control: The timber-reinforced berm that sits atop the earthen levee along Vendola Drive is inspected by District staff on an ongoing basis. At this time, direct inspections are performed where permission is granted by the private property owner as most of the levee is located on residential property and/or access is through private yards. With the help of the Santa Venetia Neighborhood Association (SVNA) in obtaining additional permission forms, staff has been able to directly inspect and/or photograph from adjacent property the TRB on all but 2 properties. For these two properties, and for those for which the District would like to complete a more thorough inspection, staff are coordinating with County Counsel on strategy as there are several complicating legal factors associated. Trees and certain other types of vegetation are an ongoing threat to levee and TRB stability and visibility.

Maintenance: As previously mentioned at the last AB meeting, five high priority properties along Vendola Drive were previously identified, and all were repaired in summer of 2016. In addition, staff was able to repair the next three priority properties on the inspection list in 2017 for a total cost of $35,000. The remaining contract balance of about $16,000 will be used for one or two more repairs on the next priority properties later this spring.

Rodents: Rodent control efforts on the earthen levees are ongoing, and are conducted in accordance with the County's Integrated Pest Management policy. Gopher activity has increased recently. Abatement and bentonite pumping cost a total of $27,008 last year. Residents who notice rodent activity can contact the District to request information on how to fight burrowing rodents in their yards and/or report problems in nearby levees.

Precipitation and Stream Gauges: Through a California Department of Water Resources (DWR) grant for Flood Emergency Response Projects, a new gauge is being installed at the Marin Civic Center garage which would make real-time rain data at that location available to the District, other agencies, and residents on the website *marin.onerain.com*. This will improve situational awareness during rain storms in Flood Zones 6 and 7 starting next rainy season, and potentially supports future studies and

Datum Elevations Referenced to NAVD 88 (in feet)	
Top of Proposed TRB before settling	12.5
Estimated Elevation Of Proposed TRB in year 2050	11.5
Projected 100-year Water Surface in year 2050	11.5
Projected 100-year Water Surface in year 2030	10.6
Approx. Top of Existing TRB (as of 2006 survey)	9.7
FEMA 100-year Water Surface	9.8
Mean Higher High Water (MHHW) (Golden Gate)	5.9
Mean High Water (MHW) (Golden Gate)	5.3
Mean Sea Level (MSL) (Golden Gate)	3.2
Mean Low Water (MLW) (Golden Gate)	1.2
Mean Lower Low Water (MLLW) (Golden Gate)	0.1
North American Vertical Datum (NAVD88)	0.0
National Geodetic Vertical Datum (NGVD 29)	-2.7

designs. Prior studies and designs for Zone 7 were supported by data from a District gauge in Novato, but given Marin's many varied microclimates this new more nearby gauge will increase accuracy.

The contract with High Sierra for installation of the new Civic Center gauge, and 8 other gauges across the county, went to the District Board of Supervisors on February 27th, 2018. This project doubles the size of the existing gauging network being maintained by the District. $87,000 of this installation work is being funded through the DWR grant, and the remaining $35,470 is from the County General Fund emergency preparedness funds (one-time installation costs only). Ongoing annual maintenance costs associated with the Civic Center gauge are estimated at $3,000. Based on the recommendations of the Zone advisory boards these costs will be split between Zone 6, Zone 7, and the Las Gallinas Valley Sanitary District, for a total Zone 7-share estimate for this gauge of $750 per year. This is in addition to the existing gauge system maintenance budget.

Storm Response: Before, during, and after storms, the District, with the help of the Conservation Corps North Bay, inspects and clears flood control facilities as needed. They are also available for sandbagging and/or tarping levees if requested. The District keeps sand and bags, for authorized emergency use only, at Pump Stations #2, #4, and #5. Additionally, District crews make rounds to all of the District pump stations to make sure they are in working order, and receive alarms from the pump stations to warn of emergency situations. The District also has a fleet of portable pumps which are maintained and tested prior to the winter season and some are pre-deployed in key locations, such as on Meadow Way and Estancia Way.