

**FLOOD CONTROL ZONE 1 ADVISORY BOARD MEETING**  
**FEBRUARY 5, 2020**

**STAFF REPORT**

**Item 1. Approval of Meeting Minutes: February 13, 2019**

**Recommended Action:** Approve minutes.

**Item 2. Open Time for Items Not on the Agenda**

Comments will be heard for items not on the agenda (limited to three minutes per speaker).

**Item 3. Old Town Novato Flood Group Update**

The Old Town Novato Flood Group will have an opportunity to speak to the advisory board regarding recent community activities and coordination with the City and District as well as future plans.

A special meeting was held by the advisory board on November 6, 2019, to hear a presentation from the recently formed Old Town Novato Flood Group. Written statements from several members of their group provided at the November meeting are attached to this staff report. The following actions were proposed for consideration at that meeting.

<b>Requested Actions:</b>
1) Annual removal of vegetation and debris [from Warner Creek off Joan Ave]. <b>See Item 6.a) ii and Item 5.f)</b>
2) Remove sediment from creeks more frequently and deeper. <b>See Item 5. a and f) and Item 6.a) ii</b>
3) Reduce flow restriction on Novato Creek at SR 37 crossing. <b>See Item 5.a), b), and d)</b>
4) Maintain and install additional flap gates on storm drains discharging in creeks. <b>See 2016 Novato Creek Hydraulic Study Short term alternatives (S-2) at:</b> <a href="https://www.marinwatersheds.org/sites/default/files/2018-04/2016_NWP_AlternativesAnalysis_Report_FINAL.pdf">https://www.marinwatersheds.org/sites/default/files/2018-04/2016_NWP_AlternativesAnalysis_Report_FINAL.pdf</a>
5) Use portable pumps during flood events to minimize street flooding.
6) Provide residents with advanced alert notification of imminent flooding. <b>See Item 7 and register for emergency alerts via text, email, or phone call visit:</b> <a href="https://www.marinsheriff.org/services/emergency-services/alert-marin">https://www.marinsheriff.org/services/emergency-services/alert-marin</a>
7) Work with neighborhood coordinators on project options to improve flood system. <b>See Item 5.f) and 2016 Novato Creek Hydraulic Study at:</b> <a href="https://www.marinwatersheds.org/sites/default/files/2018-04/2016_NWP_AlternativesAnalysis_Report_FINAL.pdf">https://www.marinwatersheds.org/sites/default/files/2018-04/2016_NWP_AlternativesAnalysis_Report_FINAL.pdf</a>

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**Item 4. Grant Programs Status**

Staff will be available for questions but are providing this written update only. The following is an update of the Zone's active Grant Programs:

	<b>Project Name</b>	<b>Granting Agency</b>	<b>Grant Amount</b>	<b>Date</b>	<b>Grant Status</b>
<b>Current Grant Applications</b>					
A	Marin County Home Elevation Program	FEMA/Cal OES	Up to \$2.9 M	Awarded 11/12/19	In process, see <b>Item 4. a)</b>
B	Marin Critical Infrastructure Emergency Generator Project	FEMA/Cal OES	\$500 K District Wide Grant	Applied 9/4/18	Application was submitted and included Z1 \$123,750 match commitment letter. Project wait-listed by Cal OES.
<b>Grant Funded Projects</b>					
C	Deer Island Basin Complex Tidal Wetlands Restoration Project	Measure AA SF Bay Restoration Authority (SFBRA)	\$630 K	Awarded to District 4/11/18, consultant award 1/28/20	In process, <b>See Item 5.a)</b>
D	HWY 37 Adaptation Planning	Caltrans	\$130 K	Awarded 12/15/17	Complete, <b>See Item 5.b)</b>
E	Simmons Slough Water Management System Project	Dept. of Water Resources (DWR)	\$1.45 M	Awarded 2016; migrated in Sept. 2017	In process, <b>See Item 5.c)</b>
F	Local Levee Evaluation	Dept. of Water Resources (DWR)	\$403 K	Awarded on 6/19/18	Complete, <b>See Item 5.d)</b>
<b>Projects Denied or Not Competitive Enough for Grant Funds</b>					
G	Rush Creek Watershed Study	Seeking cost share with City, County, and Transportation Authority of Marin	\$150,000	Pending	<b>See Item 5.e)</b>
H	Novato Creek Sediment Removal (2020)	N/A		Construction scheduled Summer 2020	<b>See Item 5.f)</b>
I	Lynwood Pump Station Reconstruction	Cal OES denied 2017 application for "immediate needs" HMGP		Construction targeted Summer 2021	<b>See Item 5.g)</b>

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Each time a major federal disaster is declared in California, FEMA HMGP funding becomes available to the state through the California Office of Emergency Services (Cal OES). Wildfires in 2015, 2017 and 2018, and storms in 2017 and 2018 have led to a steady stream of HMGP funds towards our state and with climate change this increased frequency and severity of disasters is likely to continue. HMGP funds are available for sustainable and cost-effective projects that reduce communities' losses from natural hazards. Examples of projects that can be funded include elevation, acquisition, relocation, retrofitting, floodproofing, or other improvements of structures, including residential structures; flood diversion and storage, floodplain and stream restoration and other community-scale projects. Typically, these projects must have a benefit to cost ratio greater than one and cost less than about \$4 to \$5 million.

a) FEMA 2016 Hazard Mitigation Grant Program (HMGP) – Home Elevation Program

In 2016, following the 2015 Valley and Butte wildfires, the Marin County Department of Public Works (DPW) submitted to Cal OES a home elevation assistance application at the request of the Flood Zones 1, 3, 4, 5, 7 and 9 advisory boards (with a small amount of zone funding recommended for application preparation and homeowner outreach). More than \$50 million was available to the state in increments of no more than \$3 million per project, with a minimum 25% local match required. FEMA approved the grant November 12, 2019 and the County is currently working on formalizing this new program and supporting homeowners in completing home elevations within the next few years. The current recipients include 16 residential properties that were evaluated as ranking higher than others for feasibility (cost estimate being the main factor). **Note, DPW and the Marin County Community Development Agency (CDA) submitted two follow-up applications in 2017 and 2019 with additional properties that have since been denied by FEMA due to low ranking among competing projects.**

**During the process of preparing applications hundreds of homeowners throughout the County (unincorporated, incorporated, within and outside of District Zones) expressed interest in home elevation assistance. At this time DPW is treating the 2016 application as a pilot project. DPW and CDA will evaluate if and how the program may continue given what we learn going through this first set of homes. Although flood zones 1, 3, 7, and 9 funded the grant applications, the County has approved funding for this fiscal year and next for the proportion of administrative costs associated with project implementation that will not be reimbursed by FEMA/Cal OES.**

**If it continues to be implemented, the goal of the overall home elevation program would be to help fill the gaps in creating safe, healthy and sustainable communities in Marin. Following this pilot project, an ongoing home elevation program could be a cost-effective tool to increase socioeconomic equity in our communities. The program would target low- to moderate-income homeowners and/or landlords will be required to lease to low- to moderate-income tenants. Only primary residences will be included.**

**Properties must be unlikely to receive similar benefit from any community-scale projects such as creek capacity expansion or levee improvements. Nearby infrastructure must be easily adaptable so that roads and utilities are still usable if flooding occurs around the elevated home. Only homes with high benefit-to-cost ratios will be considered. Therefore, repetitive loss properties, properties in sea level rise areas, and those where flood depths are high relative to their finished floor elevation will be targeted. Projects in sensitive environments, or where there is a lack of hydraulic studies, or areas with an increased level of regulation (FEMA floodways, some cities and towns) may be excluded due to higher costs.**

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### b) FEMA 2018 Hazard Mitigation Grant Program (HMGP) – Marin Critical Infrastructure Emergency Generator Project

An application was submitted in 2018 to Cal OES, which administers FEMA HMGP funding in CA for consideration of HMGP funding for three generators to be utilized by the Flood District. One of the three generators would have been used in Flood Zone 1 at the Lynwood Pump Station, which currently does not have any emergency backup power source and experiences frequent power outages (including last December when the power line serving it went down shortly before Christmas). The Federal share request in the amount of \$500,000, requires a local match of \$375,000 of which Zone one would contribute \$123,750 as authorized during the May 3<sup>rd</sup>, 2018 Z1 Advisory Board Meeting. **The application is associated with FEMA mitigation funding from the December 2017 CA wildfires and was not approved this round. It may be considered for future funding rounds.**

### **Item 5. Project Updates**

See the previous Staff Reports and minutes for additional background and more details on these projects.

### a) Measure AA SF Bay Restoration Authority – Deer Island Basin Complex Tidal Wetlands Restoration Project - Design

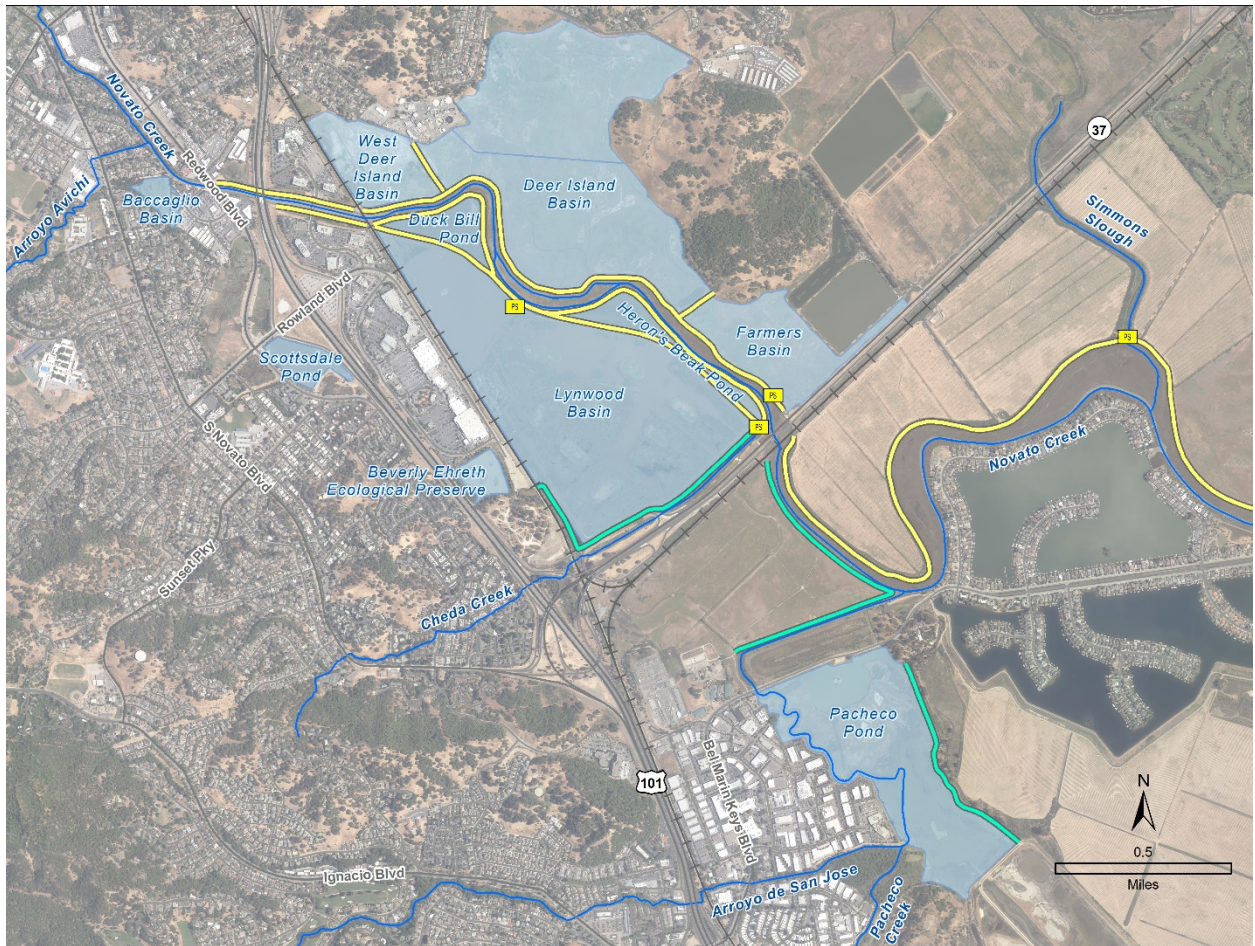
The SF Bay Restoration Authority (SFBRA) Governing Board approved the grant application to Measure AA in the amount of \$630,000 during their meeting on 4/11/18. This funding will include final preliminary and final design, preparation of construction plans and specifications and final permitting for the first phase of Deer Island Basin Tidal Wetlands Complex Restoration Project (for which a previous grant completed a conceptual design). The Marin County Flood Control & Water Conservation District's Deer Island Basin Complex includes both the Deer Island Basin and the two stormwater ponds (Ducks Bill and Herons Beak) along Novato Creek as shown on the map below. In August 2019, staff solicited a Request for Proposals and four proposals were received. Interviews were then conducted with the highest ranked firms in October 2019, and ESA Associates was recommended as the preferred consultant to furnish the professional services.

The cost for all proposals exceeded the available budget. Staff worked with SFBRA staff to modify the scope to scale back the design for the Deer Island Basin restoration element to a preliminary design level while leaving the scope for the restoration of the two ponds adjacent to Novato Creek unchanged. Restoration of the two ponds would effectively widen Novato Creek and increase the floodplain in that location.

On January 28, 2020, the District Board of Supervisors approved a professional services agreement with ESA Associates. ESA's team is comprised of experts in the fields of hydraulic, geotechnical, and civil engineering and has proven experience with the design and permitting of complex tidal wetlands restoration projects. The cost for these professional services is \$738,540 (including a contingency task) with \$630,000 of the costs being recoverable through the SFBRA grant award and the remaining \$108,540 from Flood Control Zone 1 funds. Note, a \$60,000 match from Zone 1 was identified as part of the grant application commitment so the increased commitment needed is included in the proposed budget outlined in Item 8.

It is estimated that the design will be completed by 2021, with intermediate results and products to be presented through the watershed web site [www.marinwatersheds.org](http://www.marinwatersheds.org), Flood Control Zone 1 Advisory Board meetings, and community meetings. Additional funds, which are currently not identified, would be needed for actual construction of the project. Construction is likely to cost several millions of dollars, but the cost estimate will be refined as part of the final design.

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### b) Caltrans HWY 37 Adaptation Planning Grant

The County of Marin, with matching funds from Zone 1, received a planning grant focusing on adaptation due to climate change for the Highway 37 corridor in Marin. The entire length of highway, from Novato to Vallejo, has been the subject of several recent studies on conditions in the corridor and which have provided some alternative scenarios to address both flooding concerns, both now and into the future, and traffic congestion. While the Marin segment does not experience traffic congestion as it is already four lanes, the roadway's elevation has already resulted in flooding that closed it for several weeks in 2017 and again in 2019. With projected sea level rise and increased frequency and intensity of storms, flooding in the area is expected to worsen. Work under this grant was completed throughout 2019 by CSW/Stuber-Stroeh with CivicKnit and included reports and public meetings. See final documents prepared under this grant here:

<https://www.marinwatersheds.org/resources/projects/highway-37-adaptation-study>

A takeaway from this study relevant to potential future Zone 1 partnerships includes: Caltrans is encouraged to integrate landscape-scale marshland restoration into transportation planning. This potentially ties SR 37 goals to Deer Island Basin Complex Restoration and additional potential restoration projects downstream of SR 37.

### c) Simmons Slough Water Management System

Wood-Rogers is finalizing the design work and preparing plans and specifications for construction. Meanwhile District staff are coordinating with environmental regulatory



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agencies to secure the necessary project permits. The project involves installation of a new pump station at the current site of a portable pump at the downstream end of Simmons Slough at Novato Creek across from Bel Marin Keys. The project includes upgrades to several water management structures upstream of SR 37. Staff are working with PG&E to install new power lines to the proposed pump station. The construction work has to be completed by Fall 2020 with a final completion date for the project for reporting extended by one year until early 2021 and the project is currently on-track to meet this schedule, provided construction bids this spring come in within budget. The Zone has \$1.45 million available through the State grant.

As part of the grant conditions, the enhancement of at least three acres of wetlands is included in the overall project scope. The District has an Agreement with Marin Audubon (Audubon) to provide them with \$45,000 (\$40,000 is grant reimbursable) of funding to purchase and install native plants and enhance wetlands over three acres of the Audubon property in northern Simmons Slough. The Agreement includes a provision for Audubon to perform visual monitoring over a five-year period.

### d) Novato Creek Levee Evaluations

This grant is under the DWR Local Levee Assistance Program (LLAP) and included the evaluation of the Novato Creek levees between Highway 101 and Highway 37 and the eastern Pacheco Pond levee. The contract was awarded on 06/19/18 to GEI with a highly qualified team including Stetson Engineering and FOTH (formerly CLE Engineering). The geotechnical evaluation report and remedial alternatives report will be posted on <https://www.marinwatersheds.org/creeks-watersheds/novato-creek#undefined7>. The system frequently experiences sites of overtopping, slumping, and through-seepage and does not meet nor was designed to meet any existing criteria for levee design. Remedial alternatives identified ranged between \$5 million and \$37 million for Lynwood Levee, between \$20 million to \$41 million for Novato Creek left bank levee, and between \$7 million to \$18 million for Pacheco Pond levee. Alternatives included constructing a wider levee, seepage berms, cutoff walls, and rock slope protection, and repairing/rebuilding levee geometry. The evaluation noted that increasing the height of levees likely to overtop would increase the risk of flooding upstream and downstream unless significant protection measures outside of the study area were also implemented. Levee setback and tidal wetland restoration projects such as those proposed under the Deer Island Basin Complex Restoration project are more likely to have positive flood risk reduction impacts elsewhere.

**Funding for the improvements is not available in the current Zone budget** and staff will be working to prioritize the sections that need upgrades. Options for improvements to the Lynwood levee could be considered as part of future grant applications for creek and tidal restoration projects.

### e) Rush Creek Watershed Study

This project was identified by the Advisory Board as a secondary priority after the Simmons Slough Water Management System. Staff, the City of Novato, and Caltrans met in 2018 with the primary property owner in the lower Rush Creek area (east of Binford Road), the California Department of Fish & Wildlife (CDFW), to discuss cooperation and participation in the study as well as partnering on future maintenance activities. During the meeting it became apparent that a study which may identify the cause of backwatering the drainage channel and clarify the levels of sedimentation within the marsh immediately downstream of Binford Road is a necessary step in defining the issue.

Once funding for this study is identified, the Rush creek watershed model will leverage the City of Novato's stormdrain master plan hydraulic model and the new County-wide LIDAR

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elevation data. The City of Novato has offered \$20,000 towards this study, and the District is working with the County of Marin and the Transportation Authority of Marin to identify the additional estimated \$130,000 needed to complete the study. This study is not included in the FY 2019-20 or 2020-2021 work plan but could begin in later 2020 or 2021.

Staff continues to monitor the Rush Creek outfalls pending completion of the Rush Creek drainage study, as noted above, which will inform decisions as to the tide gate structure's (including un-gated culverts) desired effectiveness and planned repairs.

f) Novato Creek Sediment Removal (2020)

For several decades in order to maintain the design capacity of the Novato Creek Flood Control Project, sediment has been removed every four years from Novato Creek, Warner Creek, and Arroyo Avichi between approximately Diablo Ave and the SMART railroad crossing downstream of Rowland Way. The most recent sediment removal episode occurred in 2016 when some sediment was beneficially reused on a proposed future ecotone levee in Deer Island Basin. Staff are making plans for summer of 2020 to beneficially reuse all of the sediment within the Deer Island Basin Complex to support future wetland restoration projects. If environmental permits are approved, additional sediment will be placed on the site of the proposed ecotone levee as well as against levees inside of Heron's Beak pond just upstream of SR 37 that will be restored to tidal wetland within the former Novato Creek floodplain.

Stetson Engineers, Inc. recently completed a survey of the upper reaches of the Novato Creek Sediment Removal in order to refine an existing hydraulic model. Based on recent countywide LiDAR data they are also adding the Arroyo Avichi-Baccaglio-Scottsdale-Lynwood Complex bypass system to the model. This will not only be used for additional analysis during the design of the Deer Island Basin Complex Wetland Restoration but will also be used to help determine if reducing the footprint of the sediment removal may provide a similar level of flood control protection while reducing costs and temporary habitat impacts.

g) Lynwood Pump Station Reconstruction

In 2005 plans were made to replace Lynwood and nearby Cheda stormwater pump stations. At the time the Zone did not have adequate funding to proceed with construction at both locations, so the Lynwood Pump Station project was put on hold. In the interim extensive repairs and replacements have been needed, including replacing the pump station discharge pipes, several severely corroded beams that are part of the pump station structure supporting the pumps, and ongoing repairs to the pumps and motors. During the 2016-2017 winter storms Novato Creek flooded the adjacent area along Highway 37, and the Highway was closed repeatedly for weeks at a time while portable pumps were used to redirect floodwater into Lynwood Detention Basin. This basin's water levels are controlled by the pump station. The extra water in Lynwood Detention Basin did result in flooding conditions to the Highway 101 off-ramp at Rowland Way, which was closed for the duration of flooded conditions.

The District applied for funding from FEMA both to reimburse storm-related damage costs and to upgrade the pump station utilizing the plans that were prepared in 2005 and updated in 2017. The funding was denied primarily because the facility was already reaching the end of its design life. In the summer of 2019, during the course of routine major maintenance on two of the pump station's four pumps, it was discovered that the beams supporting them were severely corroded and the pump station structure is in need of rehabilitation as soon as possible. The District is currently working to update the 2017 Lynwood Pump Station Improvement Project plans and is investigating loan and other funding options as there are still not adequate funds to complete construction.

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With increased pumping capacity and an automated electrical system at the Lynwood Pump Station prior flooded conditions and road closures may have been significantly reduced. The Lynwood Pump Station Reconstruction Project will upgrade the existing pumps at the pump station and increase pumping capacity to the system to better protect the surrounding community by allowing the detention basin to collect flows during peak storm runoff events and then quickly and effectively pump down the basin both during and after the storm events to prepare the basin to contain the maximum capacity storage for the next storm system.

The pump station is currently only operated manually. The project will upgrade the electrical and mechanical systems to current standards, include a new motor control center equipped with a warning and alarm system and add an automated system to switch power to an emergency generator so that the pump station may continue to function in the event of a power outage. Every year the Lynwood Pump Station experiences several power outages, and these outages are unknown unless maintenance personnel are physically at the pump station to observe that the power is not available. Upgrading the Pump Station to an automated system would potentially prevent the loss of hours of critical continued pumping in the event of power outages between storm patrol inspections.

### **Item 6. Operations and Maintenance Update**

Staff will be available for questions but are providing this written update only.

#### a) Programmatic Maintenance Permitting Status

In 2011 District staff began working with State environmental regulatory agencies requiring programmatic maintenance permits for agencies working in waterways. Creek maintenance activities requiring programmatic permitting include vegetation management, sediment and debris removal, erosion control, maintenance and repair of flood control structures, and levee maintenance. The process began by developing a Stream Maintenance Program (SMP) Manual (see it here: <https://www.marinwatersheds.org/resources/publications-reports/marin-county-stream-maintenance-manual>) and then applying for permits from relevant agencies, which for most sites includes the CA Department of Fish and Wildlife and the San Francisco Bay Regional Water Quality Control Board.

#### i. Department of Fish & Wildlife (DFW) Routine Maintenance Agreement (RMA)

In October of 2012 the CA Department of Fish & Wildlife issued a Routine Maintenance Agreement (see it here: <https://www.marinwatersheds.org/resources/publications-reports/dfw-saa-routine-maintenance-agreement-permit>) for the District's creek maintenance activities. This RMA outlines various measures required in order to minimize impacts to valuable fish and wildlife resources in Marin's creeks. The measures were not significantly different from procedures outlined in the SMP Manual. Conditions also included annual notifications, reports, and fees. Annual fees per site were originally \$112 but are now \$305.25, which for example last year in Zone 1 added up to \$6,105. The 2012 RMA was set to expire at the end of 2016, but an extension was approved until the end of 2020. This year's work program includes activities necessary in order to reapply and/or extend the RMA, including evaluating any potential for consolidating "site" definitions in order to reduce annual fees.

#### ii. San Francisco Bay Regional Water Quality Control Board (RWQCB) Order

This permit an additional 2-3 years to develop than the RMA on which it was built. During the summer of 2017 RWQCB issued the first Waste Discharge Requirements and Water Quality Certification for five years of the District's Stream Maintenance Program. The thirty-page order came with 62 conditions (see here it: <https://www.marinwatersheds.org/resources/publications-reports/rwqcb-smp-permit>) and RWQCB has allowed the District to stagger their compliance over the first several years of



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the permitted period. Some conditions resulting in the most significant changes to maintenance practices, creek inspection, and documentation processes include:

- Maintenance activities including vegetation management (not for purposes of fire fuel reduction), sediment and debris removal, erosion control, maintenance and repair of flood control structures, and levee maintenance may not exceed a program wide cumulative total of 5,000 linear feet of creek channel and 11,000 cubic yards of sediment and debris.
- Vegetation management activities are limited to above ground trimming, limbing and removal. The SMP Manual allows for limited treatment of emergent vegetation removal (like cattails and tules). The work must leave the subsurface root structures behind to allow it to reestablish in the spring and summer. Full root mass removal of cattails can be performed using hand tools to maintain a low flow channel. Requests for sediment removal must be submitted separately.
- By May 1 of each year RWQCB requests that the District submit a list of sites to be maintained that summer for their review and approval. The year 2019 is the first year that RWQCB denied vegetation management approval until it could verify planned work would not exceed program limits. Because of this, staff needed to identify specifically a subset of which sites would have maintenance activities and what the estimated length was. Previously we had been notifying DFW and RWQCB each May that the full length of nearly all sites would be included in the program as we do not know exact sites and lengths needing work that early in the year, but this exceeded the program limits of 5,000 linear feet by approximately twelve-fold. In order to narrow down the program early in the year staff developed a new method of estimation of maintenance needs based on a new process for GIS data collection coupled with prioritization of sites based on property ownership.

### b) Preventive Maintenance Program Status

#### i. Pump Station Maintenance

None of the pump stations have pumps up for major preventative maintenance this year. (Individual pumps and motors are scheduled for major maintenance on a six-year interval.) All of the pumps in the zone (Lynwood and Cheda Pump Station, and Farmers and Simmon's Slough pumps), are run and checked monthly during the summer and more frequently during the winter season even if there is a dry period. Each year before the rainy season each pump station's electrical components are tested and the engines maintained.

In 2019 two pumps at Lynwood Pump Station were scheduled for major maintenance. The total contract cost for this work was \$109,448.77 which was considerably more than expected due in large part to extraordinary wear and tear on one of the pumps, need for complete motor rebuild for the other pump, and severely corroded pump station support beams that had to be replaced.

Also, in late 2019 the power line serving the pump station went down. PG&E placed a temporary generator while they worked to restore service. Loss of power is a frequent occurrence at this pump station and a permanent generator should be a component of future Pump Station improvement projects.

#### ii. Vegetation Management

Vegetation maintenance within flood control owned properties and easements occurs July through October. Maintenance work includes trimming of vegetation in the channel and debris removal. Most of the work is performed under contract with the North Bay Conservation Corps. Pre-inspections of the creeks and channels are conducted to determine maintenance needs so as to reduce annual costs and to prioritize work. Maintenance operations continue throughout the summer so that creeks and channels throughout the Zone ready for the winter season flows. The final step is cutting of cattails which occurs in October right before the rains.

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### iii. Sediment Management

In 2019 accumulated sediment was removed from a flat section of creek beneath and just downstream of Center Road in Vineyard Creek. In this location a large storm drain pipe discharges at an angle that further exacerbates sedimentation. Based on post-construction monitoring and adaptive management conducted after the 2008-2009 channel enhancement and bridge replacement project there, a preliminary design was prepared for a proposed baffle wall to help direct flows from the storm drain pipe in a downstream orientation along with the flow of the creek. Staff will work on final design and permitting this year with the goal of reducing ongoing maintenance costs once implemented.

### iv. Precipitation and Stream Gauge Maintenance

The District maintains several precipitation and stream gauges throughout the County which help inform us of water levels in creeks and heavy rainfall in real-time. With grant funding, Zone 1 has new and recently updated gauge sites near Stafford Lake, and on Novato Creek and at the Library, Rowland Way, and the confluence with Pacheco Creek. Some additional grant funding supports rating curve development. For more information on the gauges visit <https://marin.onerain.com/home.php>. Preventive maintenance on the gauges is performed twice annually - September/October and February/March - and as needed.

### c) Settlement Monitoring

For several decades the District has been monitoring settlement markers in residential communities adjacent to tidal creeks every four years, including at Bel Marin Keys. The next survey is due in 2020 and will be performed by the County's in-house surveyors as included in the proposed budget in Item 8.

The Novato Creek Levee Evaluation scope included a memo recommending expansion of the settlement monitoring program to the Novato levees. There is no funding available for this currently but using this memo the Zone could consider incorporating new settlement markers into the Lynwood Pump Station Upgrade and/or Deer Island Basin Complex Wetland Restoration or other future projects.

## **Item 7. Marin County Flood Forecast Model**

County staff are developing a Marin Real-Time Flood Forecast Model. This tool is being developed through statistical analysis of every event in the District's roughly 25 years of rain and stream data record. One thing that jumped out is that Marin flooding is really spiked by the shorter duration rainfall events in the 10 to 15-minute rainfall bursts. Marin's watersheds are flashy, so these short-term rainfall bursts impact our creek water surface levels. Marin's small and flashy watersheds make it immediately clear that our new Marin model needs to account for the short-term duration intensities both historically and in order to forecast flooding. The new model considers:

*1. Antecedent (past) Rainfall* conditions

*2. Maximum Rainfall Intensity* for six storm durations currently set at 10-, 30-, 60-, 120-, 240- and 360- minutes.

*3. Average Rainfall Intensity* for Same Durations as 2.

*4. Rainfall Intensity "Spikiness" Factor* staff have proposed a new factor which is simply the maximum rainfall intensity divided by the average rainfall intensity for each duration (i.e. 10-minute max/10-minute average) which is a rainfall intensity "spikiness" factor of sorts.

Inputs 2 and 3 of the forecast model depend on the forecast precipitation data from the National Weather Service (NWS). NWS does not currently provide precipitation forecasts for those relatively

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small durations, but they are discussing with staff a Marin-customized forecast with at least some of the data needed for Marin's new model. NWS believes they can provide hourly data for sure, and likely some version of 15-minute data for some time before storms. We know we already get the 360-minute data for 4 or 5 days before events (the quantitative precipitation forecast, QPF tables) so we may also be able to obtain forecasts for the 120- and 240-minute intervals.

### **Item 8. Zone 1 FY 2020-21 Budget and Work Plan Review**

The Zone 1 budget for FY 2020-2021 (begins July 1, 2020 and ends June 30, 2021) will be presented to the District Board of Supervisors later this year in May and June. As usual, the approved budget may always be adjusted as necessary as priorities and cost estimates for projects and studies planned for this coming fiscal year are more clearly identified.

For the most recently closed fiscal year (FY 2018-19), actual expenses were lower than budgeted expenses. For FY 2018-19 actual revenues were about \$100k higher than estimated. The proposed FY 2020-21 budget, and budget line item descriptions are attached.

**Recommended Action:** Recommend that the District Board of Supervisors approve the proposed budget.

### **Item 9. City of Novato Storm Drain Master Plan**

The City of Novato tentatively plans to bring a proposed storm drain master plan to the Novato City Council on February 25, 2020. The City prepared a storm drain system model to support development of the master plan which they shared with the District in 2019. City drainage facilities connect to several District managed facilities. Zone 1 models and planning going forward can leverage the storm drain model to increase refinement of our understanding of how water feeds into Zone 1 systems and help future Zone 1 projects maximize potential benefits to street drainage. After the City Council adopts the master plan a Zone 1-specific update will be provided at a later advisory board meeting.

### **Item 10. Schedule 2020 Meeting Dates**

District staff anticipate another meeting may be needed on November 5 after Simmons Slough Water Management Project and the Novato Creek Sediment Removal Project construction is completed and costs are known. At that time Lynwood Pump Station's reconstruction can be discussed with a better understanding of actual funding constraints.

Additional special meetings may be called by the District Manager when District business needs so dictate. Special meetings may also be called at the request of the Advisory Board Chair.

Vicky Shilzony (Joan Ave.) asked me to provide a flooding history as part of an Old Town Novato Flood Group presentation to the County Flood Control Advisory Board meeting on 11/6/2019. Vicky arranged the meeting, working with Hanna Lee. This is the first time the OTNFG attended an Advisory Board meeting.

This is what I said...

I've lived at 30 Lauren Avenue with my wife Teresa Corrigan since 1997.

Since I got interested in flooding starting in 2008, I have established working relationships with several people including Deit Stroh, Bill Long, Drew McIntyre, Tracy Clay, Pat Balderama, Laurie Williams, Liz Lewis, Hanna Lee, and Dave Nicholson, all of whom have been most helpful.

I constructed a flood record for Nave Gardens/Lauren Avenue using my own experience, interviews with other Lauren residents, Pat Balderama's records, rainfall records, and stream gauge records.

Near flooding events are common in Nave Gardens. Water comes up street drains and flows in gutters without the creeks overflowing their banks. The lowest lying home sites are impacted; most are not. On occasion, Warner Creek, Arroyo Aviche, and Novato Creek at the confluence with Warner Creek flow over their banks, impacting many more homes.

I want to highlight the most severe events of each of the last 4 decades:

1982 – This was the big one, a county-wide event that affected lots of people. Evelyn Kelly lived at 32 Lauren – she was a Nave Gardens leader of the effort to increase flood protection and protect remaining marsh. The still existing property tax measure was passed then. Novato Creek was widened, concrete banks were installed, private property was confiscated. The work was designed to keep water out of the houses, but not out of the garages or streets (Deit told me the cost curve to do more was exponential and taxpayers would not have approved more).

1998 – February 2. Nave Gardens flooded. Flood waters reached the landing of our porch but did not enter the house. Our garage had water in it.

2008 – January 25. Nave Gardens flooded. The creeks came out of their banks. Flood waters reached the step below the landing of our porch. Our garage had water in it.

2017 – Failed ballot measure E that would have raised \$1.1million/year (\$47 per single family residence) for additional flood protection in Novato. Current annual \$2million revenue is fully committed. Reference Liz Lewis presentation to Novato City Council, September 12, 2017.

2019 – February 14. The biggest of the decade, localized severe (Vicky's house on Joan) but not widespread in Nave Gardens. Lauren did NOT completely flood. Arroyo Aviche stayed in its banks.

Michael Landram  
30 Lauren Avenue  
11/6/2019

## **Vicky Shilzony Statement Script: Nov. 6, 2019 Marin Flood Control Zone 1 Flood Advisory Board Meeting**

**Handouts, Que Survey Cover PP:** Old Town Novato Flood Group Charter, Old Town Novato Flood Group Flyer, Old Town Novato Flood Group Survey Results

Introduction: Good evening, my name is Vicky Shilzony. I am an 8 year resident of Novato and live in the area known as Old Town Novato, specifically the “cabbage patch” or Nave Gardens. The group I am speaking for is called the Old Town Novato Flood Group. Members are residents of the area East of South Novato Boulevard, from De Long down to Rowland. After today’s meeting, please join us at the back of the room to take a look at some photos, share your story, and ask any questions you may have about the Old Town Novato Flood Group.

Purpose: I am here because like all of you, I want Novato to be a safe place to live and work, even during the rainy season. I love Novato because it is a great place to raise a family and has a true community spirit. Novato still feels like a small home town, neighbors know neighbors and truly care about them.

Story: During my first months in Novato one neighbor left an entire 5 gallon bucket of persimmons on my front porch. Another loaned me a garden hose, and I got to know the neighborhood pets by name.

Truly, the only reason I dislike living here is the repetitive flooding problem. Flooding is a financial and emotional burden. Mold and water damage is a health hazard. Flood insurance, doctor’s bills, residential mitigation projects, post-flood cleanup and repair, or moving out of the flood zone, the cost adds up. While flooding brings neighbors together (talking in the street during flood events, calling or going door to door to check in or to warn each other it’s time to move cars to higher ground, or sharing sandbag duty), it should not be the reason we bond.

Research shows natural disasters such as floods can have a negative influence on mental health. Experiencing a flood event can result in depression, anxiety, and post-traumatic stress. Studies also imply that a feeling of community from the government, media and other people that live nearby can lessen the impact of flood disaster on the mental health of those affected.

### **Handouts: Charter and Survey Flyer, Que PP Cover**

Residents of the Old Town area have formed a community group with the purpose of supporting common knowledge, learning about past storms and infrastructure, and considering our collective situation. Our initial outreach methods included face-to-face contact with neighbors, Facebook groups, and Nextdoor.com. We also canvassed door-to-door, handing out approximately 150 flyers to residences east of S. Novato Blvd. between Rowland and De Long. We’ve held a handful of official meetings and attended one neighborhood event.



**PP Slide 1 Map From flyer** Here is a map sketch of that area. Documentation by our community group gathered thus far includes photos and videos, personal stories, information on past actions or remedies sought as a result of damage from storm flooding, and basic demographics such as names, addresses, emails and phone numbers. 35 people have responded to the survey at this time.

**PP Slide 2 Q1** The majority of responders to our first online survey live on Joan Ave, Lauren Ave, or other streets listed on the pie chart.

**PP Slide 3 Q2** 19 people responded that they have lived in Novato for about 5 years or more, with 14 living in the area fewer than 5 years.

**PP Slide 4 Q3** almost 71% have experiences to share about flooding in the area of their property

**PP Slide 5 Q4** 68% have evidence of property flooding

**PP Slide 6 Q5** 35% of responders have stories about damage to structures or property

**PP Slide 7 Q6** and 24% with evidence of damage to property or structures.

**PP Slide 8 Q10** over 85% of responders would be available to attend and participate in meetings with the Flood Zone 1 Advisory Board or Flood Zone hosted meetings. Of course, our group may serve as an unofficial liaison between the Zone and group participants, and in light of that we expect fewer folks would attend meetings in person.

Ask: So, where should we start? Simply, our request to the Advisory Board, the City of Novato and Flood Control is do more to alleviate flooding in our streets. There are many possibilities. However, I would like to propose starting with the following actions:

- One: following through with the yearly Routine Maintenance Agreement, maintaining vegetation and debris removal every single year. The most recent vegetation removal that I personally have observed on Warner Creek off Joan Avenue was 2017. Yes, the Conservation Corps was out this year but they did not remove vegetation, they cut it at the waterline and left it.
- Two: dredging our creeks more often and deeper.
- Three: minimizing or eliminating creek restriction at the HWY 37/Novato Creek crossing
- Four: maintaining and installing additional Outfall Flap Gates on large and small drains
- Five: mobilizing a pump and hose system during flood events to minimize the amount of water that inundates streets and yards and clearing it more quickly, not just putting up “Flooded” signs.

- Six: Providing residents with, when possible, advanced alert notification of imminent flooding.
- Seven: Teaming up our neighborhood coordinators to talk through options about flood system management.

Final: Members of the Old Town Novato Flood Group are ready to work along with the City of Novato and Flood Control to evaluate and act in order to improve the quality of life in our town. We are committed to doing our part by assessing our own property, registering for AlertMarin and other alert systems, practicing a culture of general preparedness, and the like.

I will now handoff to Patrick McNicholas, an integral Old Town Novato Flood Group Project Coordinator. Thank you so much for your time.

# Yukon Way Flooding

Lake Yukon

# 1236 Yukon Way Lake Yukon

**Jan 8, 2017**



**Jan 16, 2019**









Jan 8, 2017

**1236 Yukon**



**Seven Houses are Affected**





# Baccaglio Basin

## Baccaglio Basin overflows

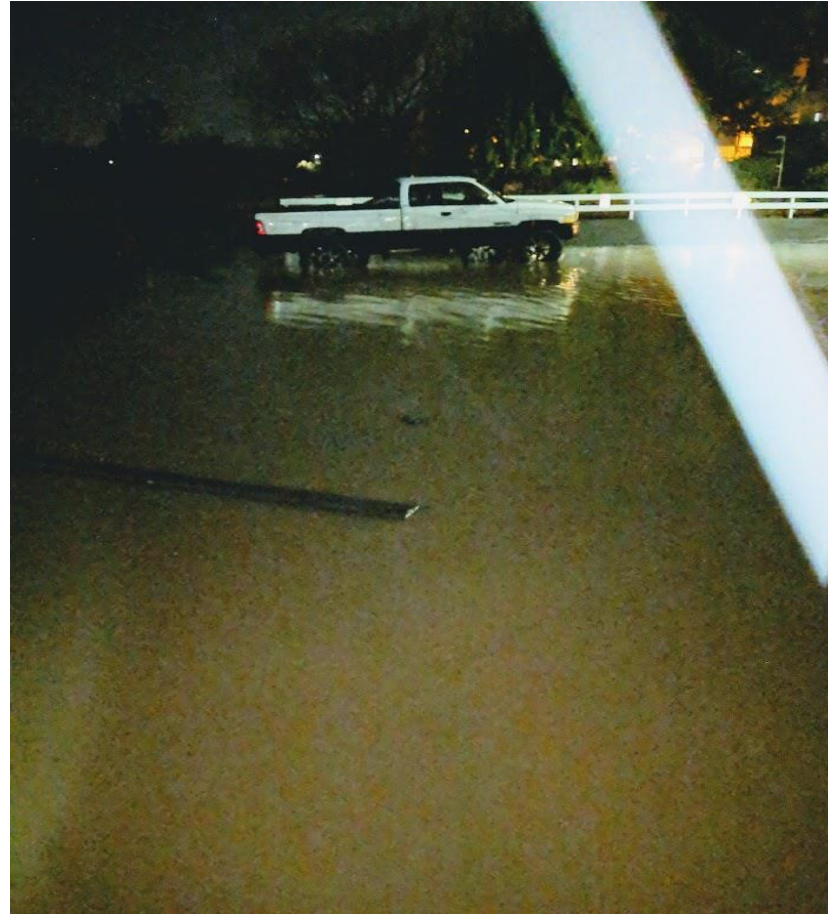




# Jan 8, 2017 Baccaglio Basin Overflowing



# Jan 16, 2019 Baccaglio Basin Overflowing



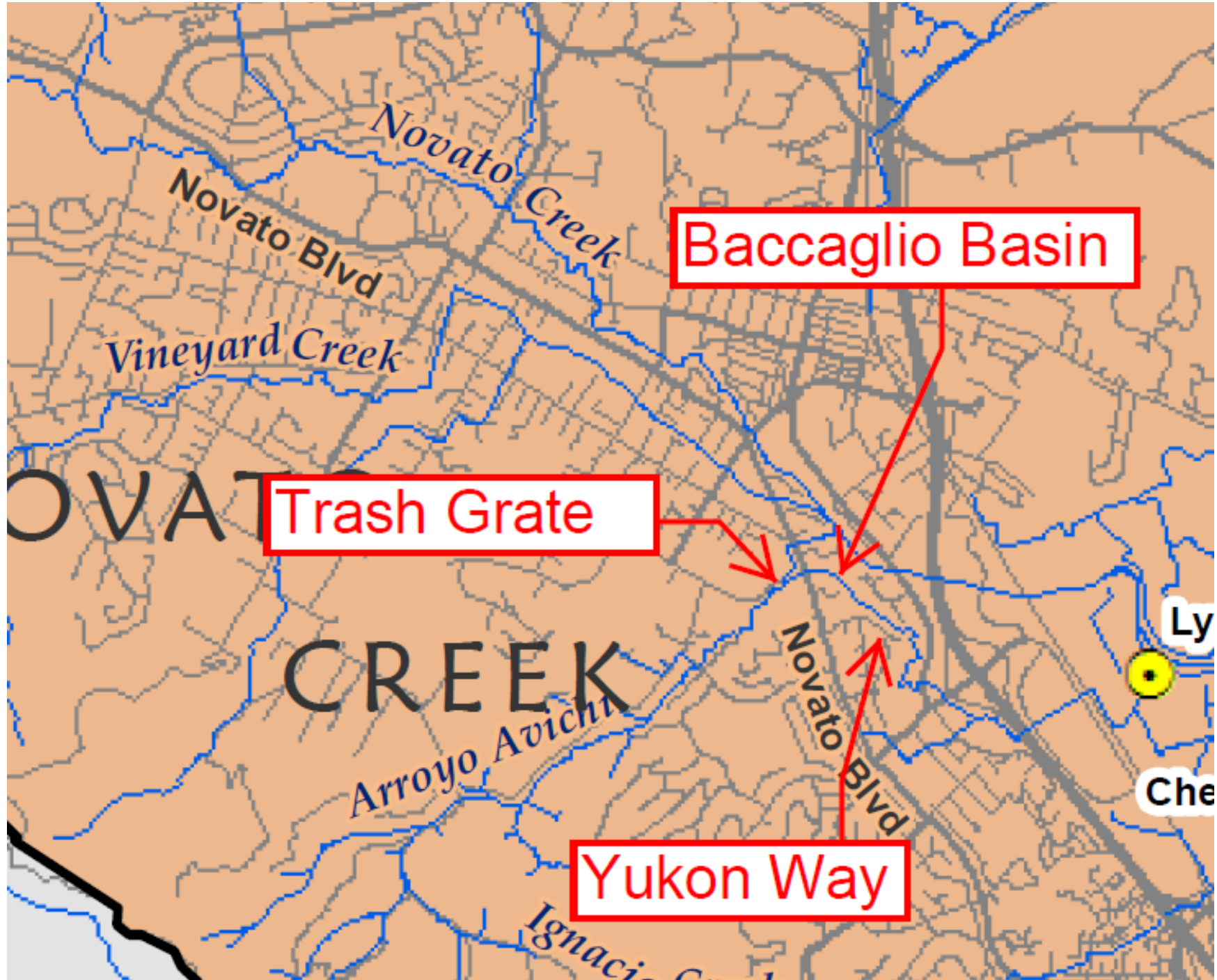


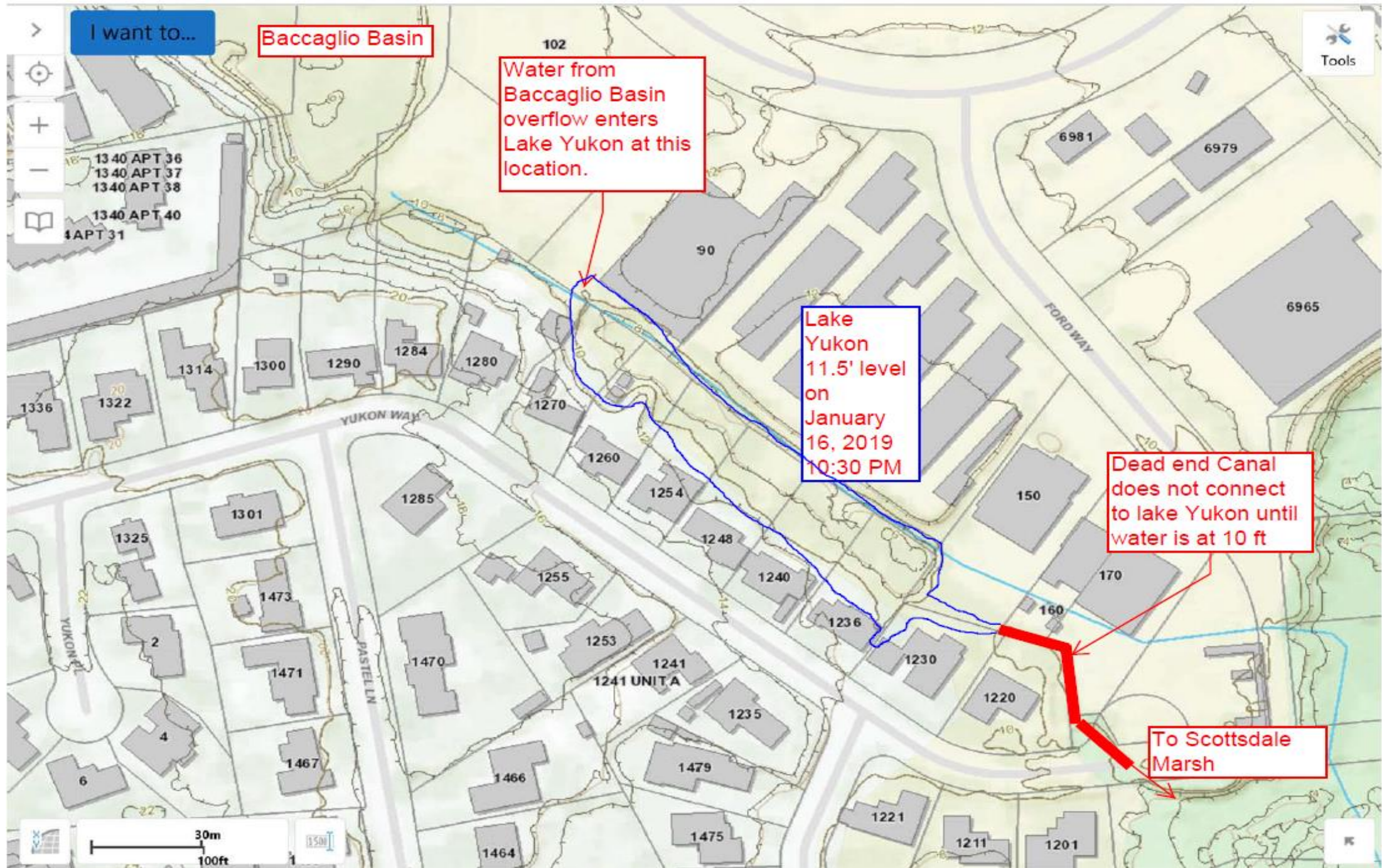
Jan 16 2019

Arroyo Avichi creek Trash grate Plugged  
diverting water to Baccaglio Basin









I want to...

Baccaglio Basin

Water from Baccaglio Basin overflow enters Lake Yukon at this location.

Lake Yukon 11.5' level on January 16, 2019 10:30 PM

Dead end Canal does not connect to lake Yukon until water is at 10 ft

To Scottsdale Marsh

- Home
- +
- 
- Layers

Tools

Scale: 30m / 100ft

1340 APT 36  
1340 APT 37  
1340 APT 38  
1340 APT 40  
14 APT 31

1325  
1301  
1473  
1471  
1467  
2  
4  
6

1285  
1255  
1253  
1241  
1241 UNIT A  
1470  
1466  
1479  
1475  
1464

FORD WAY

YUKON WAY

PASTELLIN

1475

1221

1211

1201

102

90

6981

6979

6965

150

170

160

1236

1230

1220

1290

1284

1280

1270

1260

1254

1248

1240

1336

1322

1314

1300

1325

2

4

6



Baccaglio Basin 48-  
inch Drain Pipe



# Dead end Cannel

Cannel ends behind 1220 Yukon way





# 2019 water line





# 1236 Yukon way, after flood 2019



# Issues

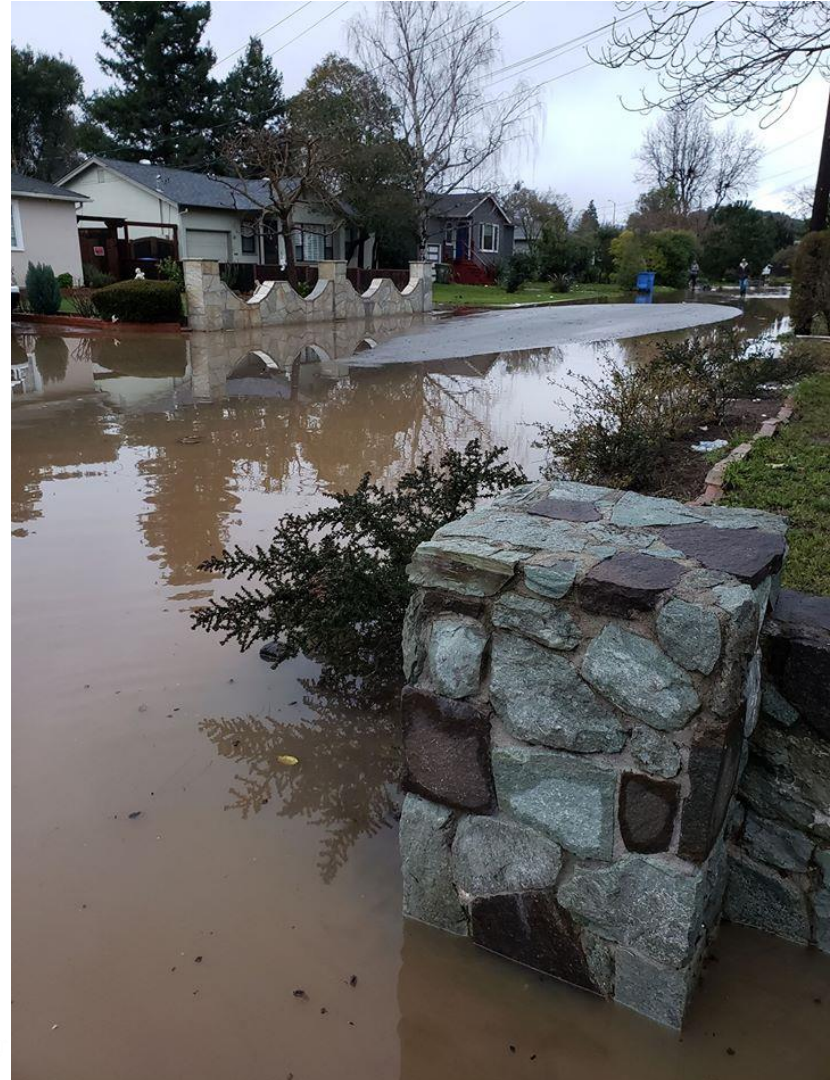
- Trash grate needs to be electronical monitored or automated
- Baccaglio Basin level needs to be electronical monitored
- Baccaglio Basin 48-inch Drainage pipe too small
- Inspect full length of 48-inch pipe
- Retaining wall on south end of Baccaglio basin 2 feet lower than other walls
- Dead end canal needs to be extended to 1236 Yukon way



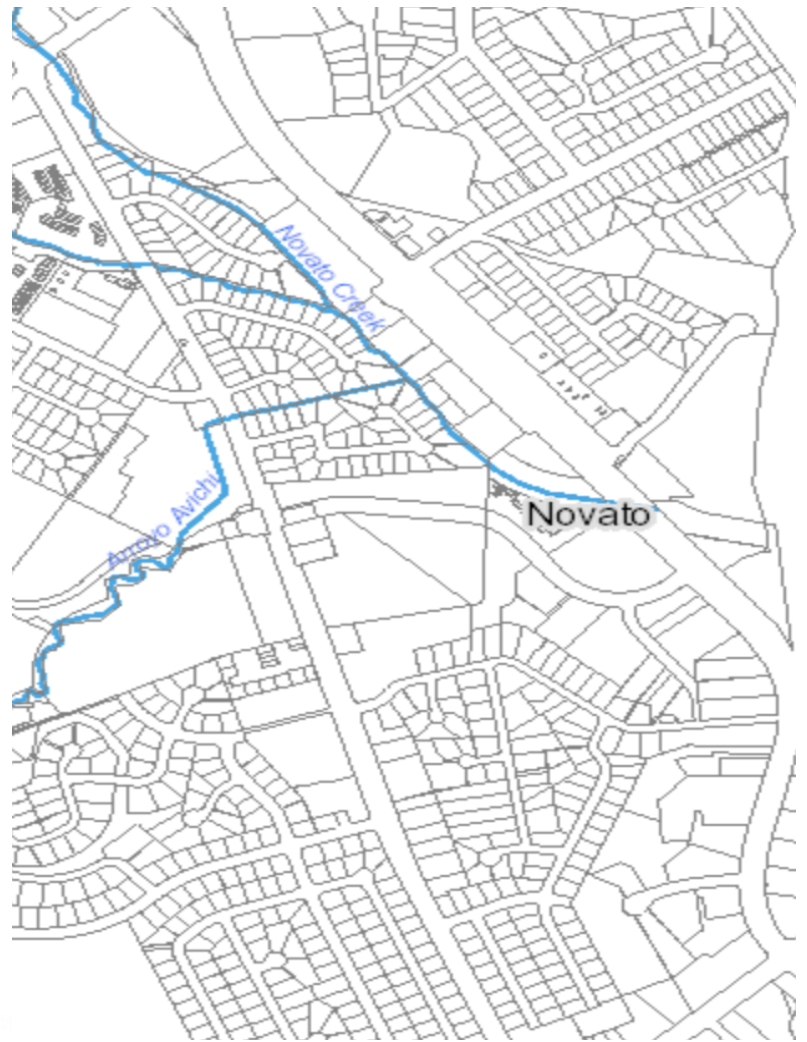
# Old Town Novato Flood Group Survey Summary

Originally created: March 22, 2019  
Total Individual Responses: 35

Friday, July 26, 2019

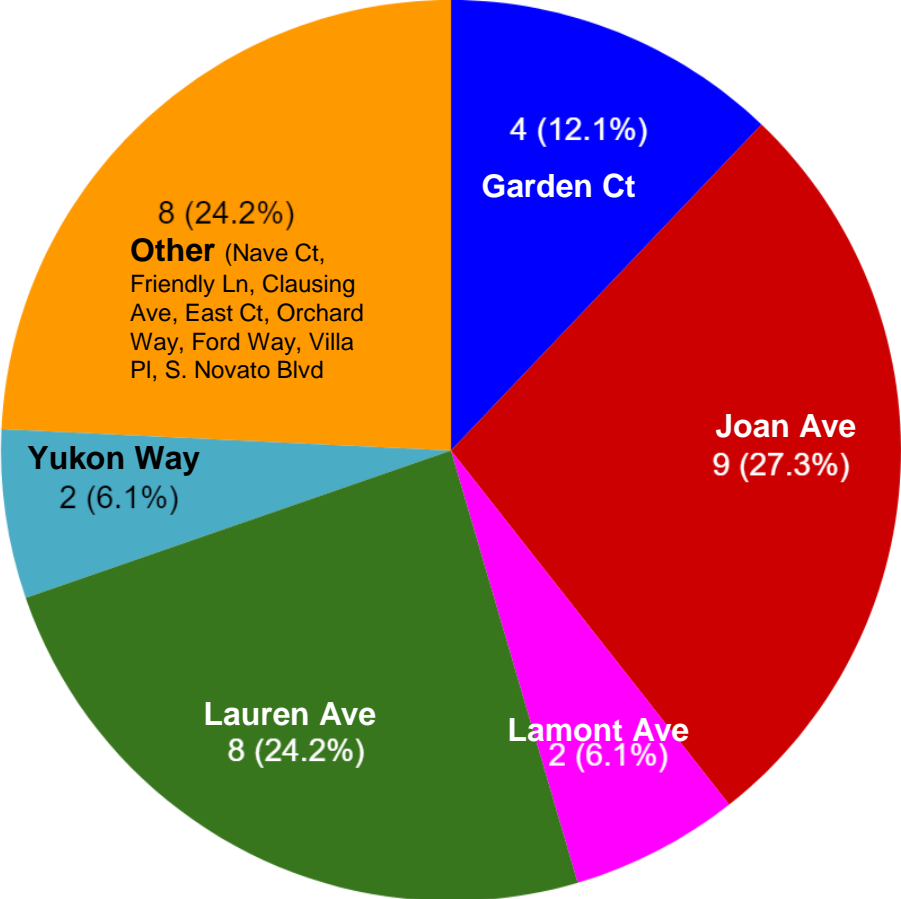


# Area Map of Old Town Novato Flood Group Initial Outreach



# Q1: Address

Answered: 33



- Garden Ct
- Joan Ave
- Lamont Ave
- Lauren Ave
- Yukon Way
- Other

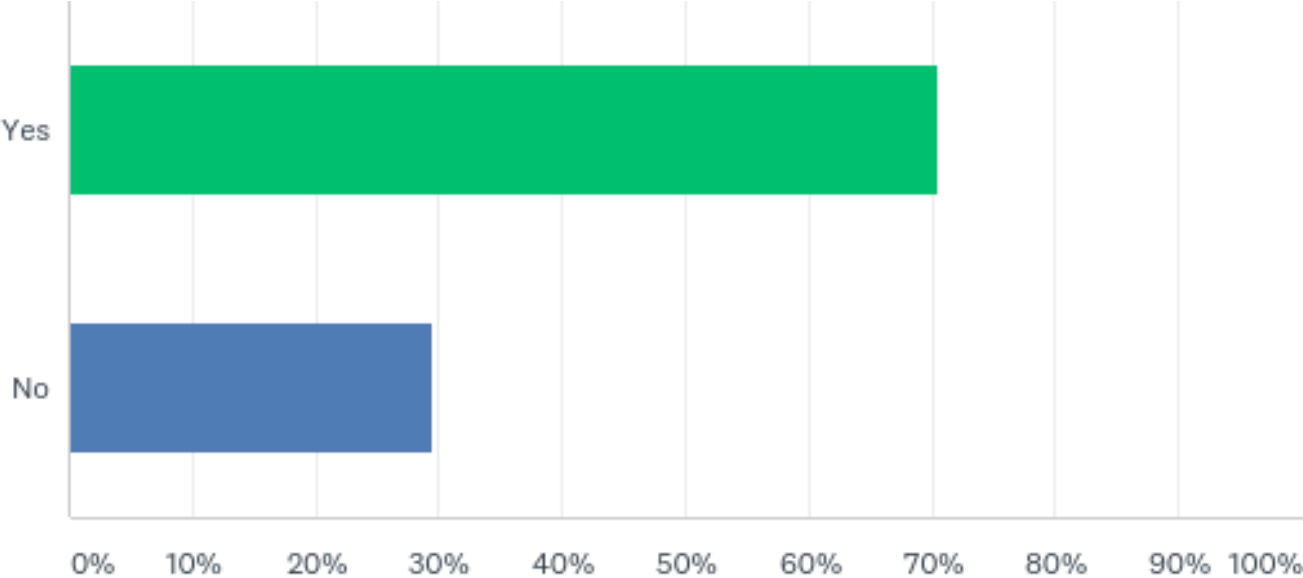
## Q2: How long have you owned or been a resident at the above address?

Answered: 33 Skipped: 2

ANSWER CHOICES	RESPONSES	
Less than 5 Years	42.42%	14
About 5 Years	12.12%	4
More than 5 Years	45.45%	15
TOTAL		33

### Q3: Do you have any stories about storm flooding occurring in the area of your property that you would be willing to share?

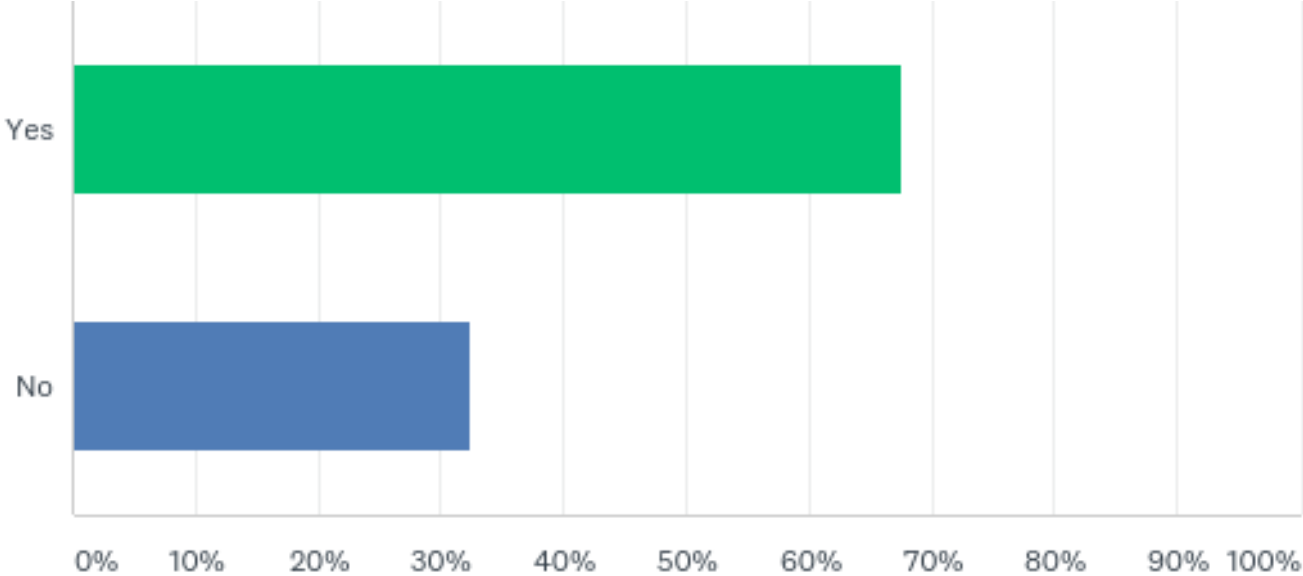
Answered: 34 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	70.59%	24
No	29.41%	10
TOTAL		34

# Q4: Do you have any evidence (such as photographs) of storm flooding occurring in the area of your property that you would be willing to share?

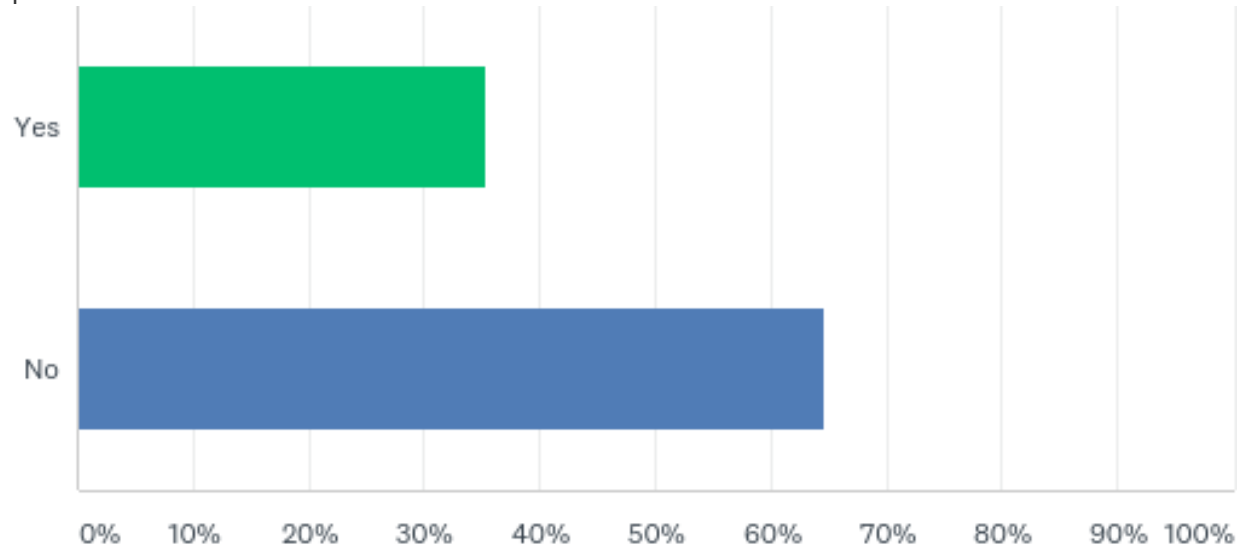
Answered: 34 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	67.65%	23
No	32.35%	11
TOTAL		34

## Q5: Do you have any stories about damage to your structures or property resulting from storm flooding that you would be willing to share?

Answered: 34 Skipped: 1

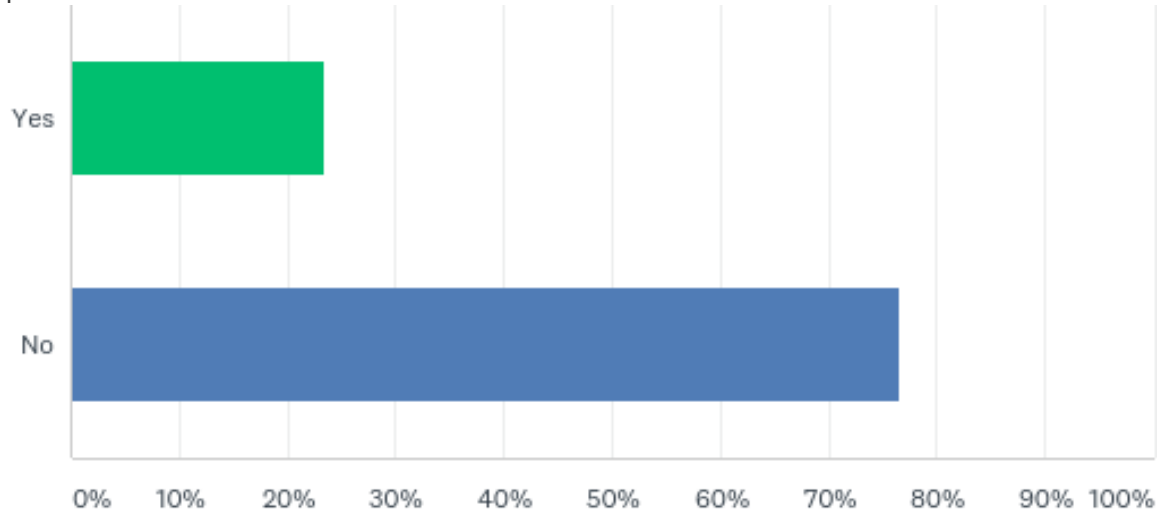


ANSWER CHOICES	RESPONSES	
Yes	35.29%	12
No	64.71%	22
TOTAL		34



# Q6: Do you have any evidence (such as photographs) of damage to your structures or property resulting from storm flooding that you would be willing to share?

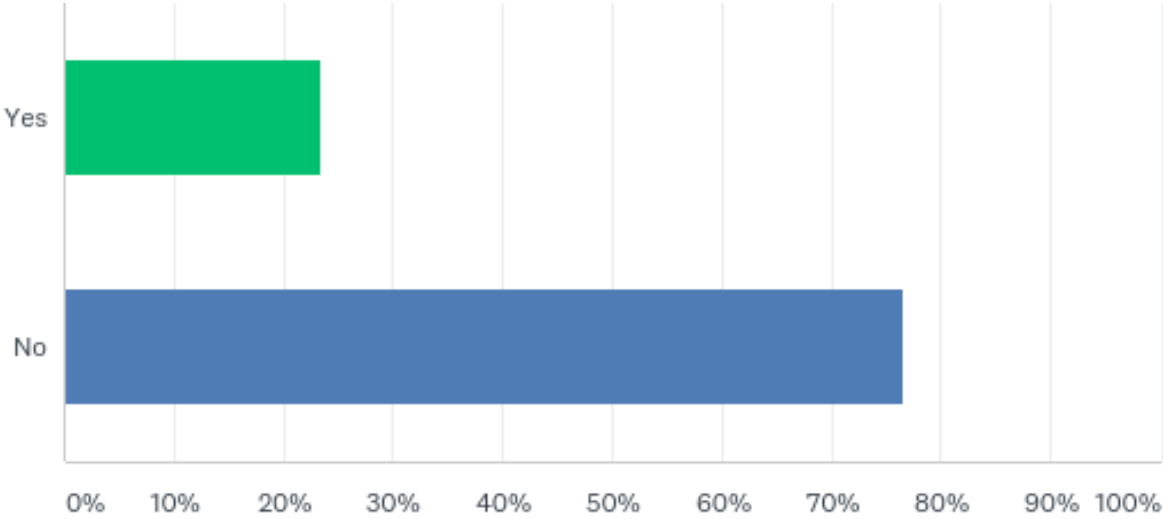
Answered: 34 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	23.53%	8
No	76.47%	26
<b>TOTAL</b>		<b>34</b>

# Q7: Do you have any information on past actions or remedies sought from Flood Zone 1 or the City of Novato as a result of damage from storm flooding that you would be willing to share?

Answered: 34 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	23.53%	8
No	76.47%	26
<b>TOTAL</b>		<b>34</b>

## Q8: Would you be available to participate in online forums such as Google Groups or Facebook Chats?

Answered: 34 Skipped: 1

ANSWER CHOICES	RESPONSES	
Yes	58.82%	20
No	41.18%	14
TOTAL		34

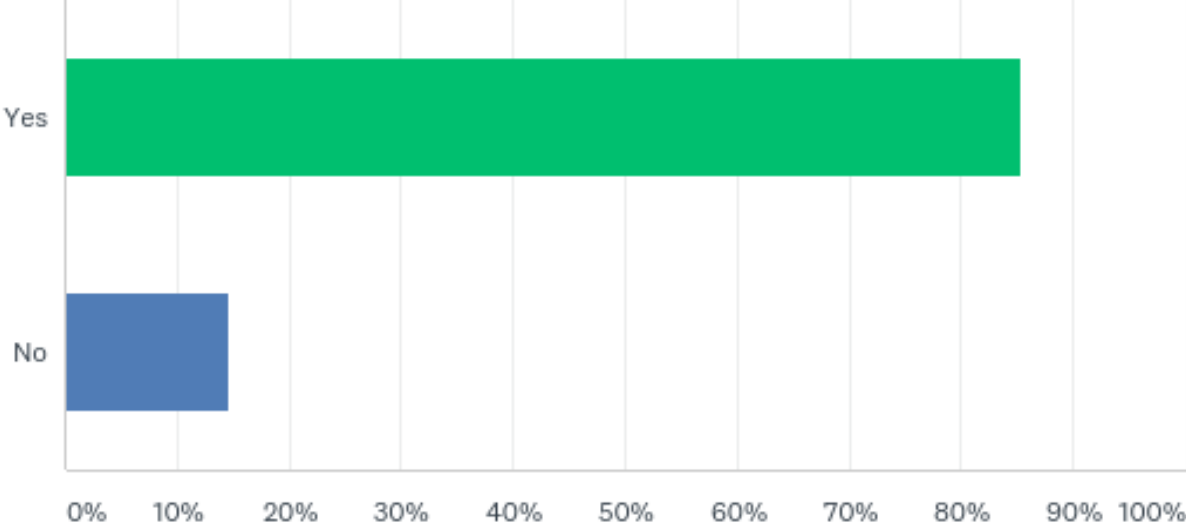
## Q9: Would you be available to attend and participate in occasional meetings of this group?

Answered: 34 Skipped: 1

ANSWER CHOICES	RESPONSES	
Yes	79.41%	27
No	20.59%	7
TOTAL		34

# Q10: Would you be available to attend and participate in occasional meetings of Flood Zone 1 Advisory Board or Flood Zone 1 hosted community meetings?

Answered: 34 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	85.29% 29
No	14.71% 5
TOTAL	34



# Q11: Is there anything you think we should have asked you related to storm flooding in our area? Anything else to add?

Answered: 20 Skipped: 15

## Open-ended answers:

#	RESPONSES	DATE
1	lets talk	7/15/2019 10:45 AM
2	How many other people have backyards that turn into lakes during a large storm?	7/10/2019 9:38 AM
3	Not sure if the city can do anything to help mitigate the storm water that collects on (and floods) our street but I would love if there was a way to do something. We bought our house last summer and did not know what we were getting into!	6/30/2019 2:05 PM
4	We are relatively new to Joan Avenue, and were surprised at the amount of flooding. We experienced significant amounts of water suddenly, with no notification or response from local authorities. Had it not been for our amazing neighborhood knocking on our door in the middle of the night and/or responding with immediate support and information, we would have had damage to our vehicle, garage and other property. It seems unlikely that there isn't more that could be done to reduce the quantity of flood water and the frequency with which the neighborhood floods. I also believe that local authorities should be more responsive than dropping off a "flooded" sign during the business hours preceding anticipated flooding. I am sure if we all work together we can identify a far more proactive and organized plan for future winters. Thanks for listening! :)	6/10/2019 11:15 AM
5	New home owner in this area	6/9/2019 10:11 AM
6	How have we prepared for future flooding or what have we done to mitigate flooding/flood control?	6/7/2019 8:20 PM
7	There is a storm drain in front of my house and overtime there is a large storm it backs up. The water floods the whole street and the water line comes half way up the driveway towards the house. There is mud all over the street when the water recedes. We have been concerned about the flooding. We wanted to report it to the city somehow in case the storm drain is clogged or has some sort of blockage causing this potential flood issue on our street that could potentially damage several homes.	6/4/2019 7:20 PM

8	I used to routinely attend the quarterly Flood District Advisory meetings in Novato, when it involves Novato Creek.	6/4/2019 9:41 AM
9	I formed a group in Nave Gardens after the floods of 2008. I'm happy to share what I have with you. Cheers. Michael	6/3/2019 2:01 PM
10	We have only experienced 1 Winter in our house, but aware of the concerns and would like to learn more and participate	6/2/2019 8:33 PM
11	We are not interested in answering any of your questions. Do not ever trespass on my property to put this anything on my property. The city of Novato has an ordnance against placing flyer and such, as it is trespassing and my privacy. Don't contact us again. And don't share my personal view on this subject in any private or public forum of any kind. Also do not mail anything to our address as we aren't interested. We might have been interested if you had not trespassed. Yes, we are upset that you feel you have the right to impose on our rights to privacy.	6/2/2019 3:39 PM
12	no	6/1/2019 10:23 AM
13	Nope	5/28/2019 6:39 PM
14	Current precautions taken? Seeking grants to raise home?	5/28/2019 5:38 PM

1 / 2

### Old Town Novato Flood Group Survey

15	trying to understand what this is	5/4/2019 10:22 PM
16	I have had no flooding last six years of ownership. Prior owners son says it has flooded two or three times in last 40 yrs. Property across street not in flood zone, makes no sense. Properties to West of us flood regularly.	4/28/2019 9:13 PM
17	Wondering if city or county have future plans regarding climate change in this area	4/28/2019 8:37 PM
18	No	4/28/2019 6:48 PM
19	The only time the Novato Creek came over the bank into our yard but not our home, after living at this residence since 1956, was in 1982 when water was released from Stafford Dam. Since acquiring my family home 3 years ago, I am now forced to have flood insurance.	4/28/2019 6:33 PM
20	Its probably going to be tough getting to meetings until our littlest one is a bit older.	3/31/2019 8:38 PM

Discussion item #  
Proposed budget item #

**Flood Zone 1 FY 2020-21 Proposed Budget**  
with anticipated three-year cash flow projection

**FY 2018-2019 Fund Ending Balance: 4,714,396.29**

**Current Year**

**Proposed budget, subject to change**

Year 1      Year 2      Year 3

**Expected Expenditure Description**      **FY 2018-19 Budget**      **FY 2018-19 Actuals**      **FY 2019-20 Budget<sup>3</sup>**      **FY 2020-21 Proposed**      **FY 2021-22 Estimate**      **FY 2022-23 Estimate**

Munis Some expenditures include 3% annual increase

(revised<sup>5</sup>)

(revised<sup>5</sup>)

Object		<b>Staffing Costs</b>							
1	1	561110	Water Resources Staff	\$ 742,006	\$ 615,045	\$ 780,488	\$ 803,903	\$ 828,020	\$ 852,860
2	2	561130	Building Maintenance Staff	\$ 8,657	\$ 11,387	\$ 8,917	\$ 9,185	\$ 9,460	\$ 9,744
3	3	561160	Vehicle Maintenance Staff	\$ 3,175	\$ -	\$ 3,175	\$ 3,270	\$ -	\$ -
4	4	561165	Engineering Division Staff	\$ 15,000	\$ -	\$ 30,000	\$ 60,000	\$ 60,000	\$ 60,000
5	5	561215	Printing Services Staff	\$ -	\$ -	\$ -	\$ 2,000	\$ -	\$ -
6	6	561220	Real Estate Division Staff	\$ 15,000	\$ -	\$ 15,000	\$ 15,000	\$ 15,000	\$ 15,000
7	7	561230	Road Maintenance Staff	\$ 140,137	\$ 323,093	\$ 95,000	\$ 95,000	\$ 97,850	\$ 100,786
8	8	561290	A87 Indirect Cost Allocation	\$ 157,994	\$ 94,918	\$ 75,532	\$ 77,798	\$ 80,132	\$ 82,536
			<b>Salaries, Benefits, and Overhead</b>	<b>\$ 1,081,969</b>	<b>\$ 1,044,442</b>	<b>\$ 1,008,112</b>	<b>\$ 1,066,155</b>	<b>\$ 1,090,462</b>	<b>\$ 1,120,926</b>
Object		<b>Service and Supplies</b>							
9	13	561175	PC Lease	\$ 360	\$ -				
13	9	521910	Maintenance of Facilities	\$ 570,131	\$ 308,189	\$ 972,861	\$ 521,000	\$ 626,630	\$695,429
15	13	522310	Miscellaneous Expenses	\$ 52,800	\$ 24,480	\$ 58,675	\$ 50,000	\$ 50,000	\$50,000
18	10	522510	Professional Services	\$ 1,856,724	\$ 673,979	\$ 1,484,625	\$ 400,000	\$20,000	\$20,600
19	11	522512	Trade or Construction Services	\$ 1,675,000	\$ 4,952	\$ 4,615,000	\$ 3,000,000	\$ -	\$ -
31	12	523510	Utilities - General	\$ 35,553	\$ 23,658	\$ 36,620	\$ 37,719	\$ 38,850	\$40,016
33	14	572010	Settlements	\$ 99,760	\$ -	\$ 99,760	\$ 99,760	\$ -	\$ -
34			<b>Service and Supplies</b>	<b>\$ 4,290,328</b>	<b>\$ 1,035,258</b>	<b>\$ 7,267,540</b>	<b>\$ 4,108,479</b>	<b>\$ 735,480</b>	<b>\$ 806,045</b>
35			<b>Total Expenditures</b>	<b>\$ 5,372,297</b>	<b>\$ 2,079,700</b>	<b>\$ 8,275,652</b>	<b>\$ 5,174,634</b>	<b>\$ 1,825,942</b>	<b>\$ 1,926,970</b>
37	15	Revenues (increase approx. 0.5% annually) <sup>1</sup>		\$2,828,214	\$2,926,979	\$2,941,614	\$2,956,322	\$2,971,104	\$2,985,960
39	16	Grant Reimbursements <sup>4</sup>				\$171,115	\$1,247,218	\$ 1,015,000	\$ -
40			<b>Projected Fund Ending Balance<sup>2</sup></b>		<b>\$ 4,714,396</b>	<b>\$ (1,456,639)</b>	<b>\$ (3,493,888)</b>	<b>\$ (2,424,187)</b>	<b>\$ (2,486,123)</b>

<sup>1</sup>This is a rough projection based on prior year revenue and does not represent the actual revenue budget.

<sup>2</sup>Fund ending balance will change with updated information

<sup>3</sup>Does not include prior year encumbrances

**Note: project/contract funds not expended in a given fiscal year will roll over into the next fiscal year**

<sup>4</sup>Estimate of grant reimbursement and expected timing distribution

<sup>5</sup>Includes funds budgeted and encumbered in prior fiscal year carrying forward

Flood Control Zone 1  
FY 2020-21 Proposed Budget  
Budget Notes

The following provides details related to the proposed budget line items in the Flood Zone 1 FY 2020-21 Proposed Budget:

**Line Item #**

1. Water Resources Staff: This line item includes staff time for Zone 1 management and administrative support (project management, grant applications and administration, oversight of creek maintenance and preventive pump station maintenance, budgeting, Advisory Board meetings, public inquiries, inter-agency coordination, planning, permitting and clerical support).
2. Building Maintenance Staff: This line item includes staff time for day-to-day pump station operations, maintenance, and troubleshoot as well as staffing during storm events.
3. Vehicle Maintenance Staff: This line item includes staff time for preventive maintenance and minor repairs of portable pumps.
4. Engineering Division Staff: This line item includes staff time for surveying and engineering support, e.g. design or design review services, constructability analysis, construction bid process administration, construction management, negotiating & approving contract change orders, and any in-house surveying requests including elevation settlement surveying at Bel Marin Keys.
5. Printing Services Staff: This line item includes staff time for printing services (notices, flyers, outreach materials, construction plans, etc.) related to Zone 1.
6. Real Estate Division Staff: This line item includes staff time for right of way negotiations and other real property issues. As a reminder the District under the administration of Zone 1 owns 1,344 acres of land and has easements and other land use agreements for approximately 2,350 acres of land within the Zone 1 boundary.
7. Road Maintenance Staff: This line item includes staff time for tide gate operations and maintenance, levee mowing, resurface, and some levee repairs, and small-scale sediment removal at various locations.
8. A87 Indirect Cost Allocation: The Marin County Flood Control & Water Conservation District is a separate and distinct political subdivision of the State of California and receives no revenue from the County. However, the County provides the staffing, financial and administrative support and other services to the District to allow it to function. In addition, the County provides the Civic Center and other facilities for administration and support services for the District operations, including the District Board of Supervisors. Because of this, each Flood Control Zone is charged an overhead cost in accordance with the County's Fiscal Policy and as allowed by the federal Office of Management and Budget (OMB) Circular 2 CFR Part 200 (as are other eligible non-county districts and organizations).
9. Maintenance – Buildings and Improvements: This line item includes outside support (vendors, contractors, suppliers, etc.) for pump maintenance (none planned this year but contingency available), Zone 1 creek vegetation maintenance and sediment removal, storm patrol by Conservation Corps

North Bay, permitting fees for creek maintenance, rodent abatement along levees, culvert and flap/tide gate maintenance, equipment rental, fuel, fence repairs on District property, and other miscellaneous support and equipment. This line item used to include contracts and subscriptions for stream and precipitation gauge maintenance but in 2019-20 the County approved a budget for this as the expanded gauging system supports emergency preparedness countywide.

10. Professional Services Contracts: This line item includes all professional services for Zone 1 projects including: environmental, cultural resources, and other permitting requirements, design, surveying, construction management, website, etc. Projects during the next two years include design and environmental review for Deer Island Basin Complex Tidal Restoration Project (this is grant reimbursable after we submit invoices for expenses), Novato Creek Sediment Removal environmental compliance needs (such as bird surveys and fish relocation), and Simmons Slough Water Management on-call contracts for design questions from contractors and specialized inspection needs (e.g. pile driving).
11. Construction: This line item for construction of Z1 projects includes construction contracts, and any materials or equipment provided by Z1 for those construction projects. Latest cost estimate for Simmons Slough Water Management System Project is \$3.1 million (DWR grant will reimburse up to \$1,400,000 after we submit invoices for expenses), Novato Creek Sediment Removal Project construction cost estimate is \$1,500,000, and Lynwood Pump Station Reconstruction cost estimate is \$3 million. A loan is needed in order to implement all projects by the end of 2021.
12. Utilities: This item includes Zone 1 costs for refuse collection (Pacheco Pond), electricity, natural gas, and water (includes PG&E costs for relevant portion of current Novato Sanitary District pump stations and proposed Simmons Slough Water Management System PG&E cost).
13. Misc. Expenses: This item includes costs for expenses not accounted for under any other line items, and any other unforeseen expenses.
14. Legal Judgements: This item includes costs for legal settlements incurred by Zone 1.
15. Revenues: This is an estimate for reference only. The advisory board is not being asked to recommend a revenue budget. For the purpose of this analysis, revenues are conservatively estimated to increase by 0.5%.
16. Grant Reimbursements: Estimate of grant reimbursement and expected timing for the Novato Creek Levee Evaluation (up to \$403,333), Deer Island Basin Complex Tidal Restoration Design (up to \$630,000), and Simmons Slough Water Management (up to \$1,400,000).