

# NOVATO SANITARY DISTRICT

Meeting Date: May 8, 2017

The Board of Directors of Novato Sanitary District will hold a **special meeting at 5:00 p.m.**, followed by a regular meeting at 5:30 p.m., Monday, May 8, 2017, at the District Offices, 500 Davidson Street, Novato.

*Materials related to items on this agenda are available for public inspection in the District Office, 500 Davidson Street, Novato, during normal business hours. They are also available on the District's website: [www.novatosan.com](http://www.novatosan.com). Note: All times and order of consideration for agenda items are for reference only. The Board of Directors may consider item(s) in a different order than set forth herein.*

## **SPECIAL MEETING AGENDA**

**5:00pm**

**CLOSED SESSION: Public Employee Evaluation:**  
General Manager-Chief Engineer (Government Code Section 54957).

## **REGULAR MEETING AGENDA**

**5:30pm**

- 1. PLEDGE OF ALLEGIANCE:**
- 2. AGENDA APPROVAL:**
- 3. PUBLIC COMMENT (PLEASE OBSERVE A THREE-MINUTE TIME LIMIT):**

*This item is to allow anyone present to comment on any subject not on the agenda, or to request consideration to place an item on a future agenda. Individuals will be limited to a three-minute presentation. No action will be taken by the Board at this time as a result of any public comments made.*

- 4. REVIEW OF MINUTES:**
  - a. Approve minutes of the April 24, 2017 meeting.
- 5. CONSENT CALENDAR:**

*The General Manager-Chief Engineer has reviewed the following item(s). To his knowledge, there is no opposition to the action. The item(s) can be acted on in one consolidated motion as recommended or may be removed from the Consent Calendar and separately considered at the request of any person.*

- a. Approve regular disbursements, April 25-May 8, 2017.
- b. Receive Deposit Summary, April 2017.
- c. Receive 3<sup>rd</sup> Quarter Investment Report, Fiscal Year (FY) 2016-17.
- d. Receive FY16-17 3<sup>rd</sup> Quarter Financial Report.
- e. Ratify District Statement of Investment Policy, Policy 3120 - Investment of Public Funds.

- f. Approve a contract in the not-to-exceed amount of \$75,000 with Duke's Root Control, Inc., (Duke's), and authorize the General Manager-Chief Engineer to execute it.

**6. WASTEWATER OPERATIONS:**

- a. Receive Wastewater Operations Report, April 2016.

**7. GRAND JURY REPORT:**

- a. Review the following items and provide direction: (i) 2016-17 Marin County Civil Grand Jury report titled "Overcoming Barriers to Housing Affordability", and (ii) draft response prepared by District Counsel.

**8. STAFF REPORTS:**

- a. Receive staff report: Attendance at the California Water Environment Association (CWEA) Annual Conference, Palm Springs, April 26-29, 2017.
- b. Receive staff report: Draft Marin County BayWAVE sea level rise vulnerability-assessment report.

**9. BOARD MEMBER REPORTS AND REQUESTS:**

- a. North Bay Watershed Association (NBWA), meeting of May 5, 2017.

**10. GENERAL MANAGER'S REPORT AND ANNOUNCEMENTS:**

Next Resolution No. 3108.

**Next regular meeting date: Monday, May 22, 2017, 5:30 p.m. at the Novato Sanitary District office, 500 Davidson Street, Novato, CA**

*In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the District at (415) 892-1694 at least 24 hours prior to the meeting. Notification prior to the meeting will enable the District to make reasonable accommodation to help ensure accessibility to this meeting.*

## NOVATO SANITARY DISTRICT

### Board Meeting Minutes

**DRAFT**

Meeting Date: April 24, 2017

A regular meeting of the Board of Directors of the Novato Sanitary District was held at 5:30 p.m., Monday, April 24, 2017, preceded by a closed session beginning at 5:00 p.m. at the District offices, 500 Davidson Street, Novato.

At 5:01 p.m. President Peters announced the Board would meet in closed session to discuss the following matters on the Closed Session Agenda:

CLOSED SESSION: PUBLIC EMPLOYEE EVALUATION:  
General Manager-Chief Engineer (Government Code Section 54947).

BOARD MEMBERS PRESENT FOR CLOSED SESSION: President Peters, Members William C. Long, Jean Mariani, and Brant Miller. Member Dillon-Knutson was absent.

STAFF PRESENT: General Manager-Secretary Sandeep Karkal.

The closed Session ended at 5:38 p.m.  
Open session began at 5:42 p.m.

BOARD MEMBERS PRESENT FOR OPEN SESSION: President Peters, Members William C. Long, Jean Mariani, and Brant Miller. Member Dillon-Knutson was absent.

STAFF PRESENT: General Manager-Secretary Sandeep Karkal, District Counsel Kent Alm, and Administrative Secretary Julie Hoover.

ALSO PRESENT: John Bailey, Plant Manager, Veolia Water  
Erik Brown, Technical Services Manager, Novato Sanitary District  
Dale Thrasher, Joint Health and Safety Program Director  
Gisa Ju, Senior Technical Practice Leader, RMC Water  
Environment/Woodard & Curran

PLEDGE OF ALLEGIANCE:

REPORT OUT OF CLOSED SESSION: President Peters stated that there was no report out of closed session.

AGENDA APPROVAL: The agenda was approved as presented.

PUBLIC COMMENT: None.

REVIEW OF MINUTES:

Consider approval of minutes of the April 10, 2017 meeting. Director Long noted a correction on page three, last paragraph, as follows: "North Bay Watershed Association (NBWA) meeting, April 7, 2017. Director Long Miller commented on his attendance..."

The General Manager stated that the minutes would be changed to reflect Director Miller's attendance at the NBWA meeting.

*On motion of Director Mariani, seconded by Director Miller, and carried unanimously by those Directors present, the Board meeting minutes of April 10, 2017 were approved.*

#### CONSENT CALENDAR:

President Peters called for a motion on the Consent Calendar items as follows:

- a. Approve capital project disbursements in the amount of \$31,216.90, and regular disbursements in the amount of \$127,336.83.
- b. Ratify payroll and payroll related disbursements for April, 2017, in the amount of \$311,707.83.
- c. Receive Accounts Receivable Report as of March 31, 2017.
- d. Receive most recent Pooled Liability Program (PLP) dividend report.
- e. Receive Workers Compensation Insurance report.

*On motion of Director Mariani, seconded by Director Long, and carried unanimously by those Directors present, the above listed Consent Calendar items were approved.*

#### CAPITAL PROJECTS:

- Collection System Improvements, Account No. 72706: Receive a progress update on the development of the District's Collection System Master Plan (CSMP) from the District's Consultant, RMC Water Environment. The General Manager stated that in July 2016, the District contracted with RMC Water Environment (RMC) to develop a Collection System Master Plan (CSMP). He stated that the District's Consultant, Gisa Ju of RMC Water Environment/Woodard & Curran, was present to provide a status update of the CSMP.

Ms. Ju addressed the Board and provided a PowerPoint presentation to outline work completed to date and currently in progress. She noted that RMC had completed the Collections System Scoping Study in 2016, and based on these findings, had developed a scope of Master Plan Objectives for the Collections Department. She discussed the wet weather flow monitoring which was completed in early 2017, provided an update of the sewer Geographic Information System (GIS), and discussed development of the hydraulic model. Discussion followed between the Board, Ms. Ju, the General Manager, and Technical Services Manager Erik Brown.

At the conclusion of this item, Ms. Ju and Dale Thrasher left the meeting.

#### ADMINISTRATION:

- Receive and review 2016-17 Marin County Civil Grand Jury report titled "Overcoming Barriers to Housing Affordability" and provide direction. The General Manager noted that the report "Overcoming Barriers to Housing Affordability" is included in the agenda packet. He stated that one of the listed recommendations of the report, i.e. Recommendation R5, states that "each utility district should adopt waivers for hook-up fees for low-income housing projects and accessory dwelling units", and the Grand Jury has asked that the District respond to this recommendation. The General Manager stated that the issue was discussed at the staff level as well as with District Counsel. He provided a brief overview of current and pending legislation on sewer connection fees

for accessory dwelling units. He noted that the District has historically charged full connection fees for residential connections. He stated that District Counsel was present to discuss the matter and take direction from the Board before drafting a response to the Marin Grand Jury.

District Counsel Kent Alm discussed the four options the District has to respond to the Grand Jury's recommendation:

1. Accept the recommendation and state that the recommendation has been implemented, and provide a summary regarding the District's implementation.
2. State that the recommendation has not yet been implemented, but it will be implemented in the future, and provide a timetable of implementation.
3. State that the recommendation requires further analysis, and provide an explanation of the scope and parameters of the analysis, and a time frame for reaching that decision, which shall not exceed six months.
4. State that the recommendation shall not be implemented because it is not warranted nor is it reasonable, and provide an explanation.

District Counsel detailed the definitions of Accessory Dwelling Units (ADU's), and low-income housing, noting that these are two significantly different matters. He stated that the response to the Grand Jury regarding ADU's could be a relatively simple response, such as: "Yes, the District will implement the law when it comes into effect in 2018." Furthermore, he stated that low-income housing is a policy decision, and the District may respond in any of the four options previously stated. Discussion followed between the Board and District Counsel. Upon close of discussion, District Counsel stated that, based on the information and direction provided by the Board, he would prepare a draft response, consistent with Option 4 above, for the Board's review at the May 8<sup>th</sup> Regular Board Meeting.

#### BOARD MEMBER REPORTS AND REQUESTS:

- California Association of Sanitation Agencies (CASA)/WateReuse California, Sacramento Public Policy Forum, April 19, 2017 (Directors Dillon-Knutson, Long, Peters).

Director Long discussed his attendance at the Public Policy Forum and stated that the presentations were very well organized and interesting.

President Peters discussed his attendance at the Public Policy Forum and stated that he was pleased with the receptiveness from the offices of Senator Mike McGuire and Assembly Member Marc Levine.

#### GENERAL MANAGER'S REPORT AND ANNOUNCEMENTS:

The General Manager had the following reports and announcements:

- Reports:
  - The General Manager attended the CASA/WateReuse California, Sacramento Public Policy Forum on April 19, 2017. Jennifer West, Managing Director of WateReuse California facilitated a discussion on direct potable reuse and legislation. Meetings with individual legislators were positive.
  - At 4:03 p.m. today (April 24, 2017), Mr. Fred Grange of Grange Debris Box Service sent an e-mail to each Board Member and the General Manager. The e-mail stated: "Dear

Sandeep and board members, I regret that due to an unforeseen emergency we must request an extension for our presentation on 5/8/16. We greatly appreciate the opportunity to make the presentation and hope you will understand. Fred Grange.” The Recording Secretary handed a printed copy of this email to each Board member and to District Counsel. Based on this e-mail, a presentation by Mr. Grange will not be on the agenda for the May 8, 2017 Board meeting. Further, for informational purposes, last week Board President Peters also sent a copy of the Solid Waste Franchise Agreement along with a transmittal letter via UPS to Mr. Grange.

- The District and North Marin Water District (NMWD) will be jointly participating in an US EPA drought case study this week. Director Long and the General Manager will be participating along with District, Veolia, and NMWD staffs.
  - NMWD General Manager Chris DeGabriele will be retiring at the end of this month. NMWD scheduled an Open House and Retirement Recognition on Friday, April 21, 2017 at the NMWD’s offices. Directors Long, Mariani, and Peters attended, along with the General Manager and the Field Services Manager.
- Announcements:
- The District held its three-day Spring E-Waste Event, April 22-24, 2017. There is no report at this time, but information on the event will be available with the next Solid Waste Quarterly report.
  - The General Manager received a thank-you commemorative photo on behalf of the District from the Novato Chamber of Commerce 2016-17 Leadership Class.
  - Member Dillon-Knutson called during the meeting and apologized for being unable to attend the meeting due to being ill.
  - Next Board meeting is Monday, May 8, 2017, at 5:30 p.m.

ADJOURNMENT: There being no further business to come before the Board, President Peters adjourned the meeting at 7:01 p.m.

Respectfully submitted,

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Sandeep Karkal  
Secretary

Julie Hoover, Recording

**Novato Sanitary District  
Board Fees Check Register for April 2017**

May 5, 2017

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<u>Date</u>	<u>Num</u>	<u>Name</u>	<u>Credit</u>
<b>May 5, 17</b>			
05/05/2017	4944	Mariani, Jean M	860.15
05/05/2017	4946	Peters, Arthur Gerald	760.15
05/05/2017	4943	Long, William C	521.57
05/05/2017	4945	Miller, Brant	
<b>May 5, 17</b>			<b><u>2,141.87</u></b>

# Novato Sanitary District Operating Check Register

May 8, 2017

Date	Num	Name	Credit
<b>May 8, 17</b>			
05/08/2017	60600	Veolia Water North America, Inc.	170,746.40
05/08/2017	60591	PARS-OPEB-Post Employment Be...	63,636.36
05/08/2017	60596	Stericycle	48,169.06
05/08/2017	60601	Veolia Water North America, Lab	28,373.51
05/08/2017	60592	PARS-PSRP-Post Employment Be...	18,181.82
05/08/2017	60587	Novato, City	13,226.85
05/08/2017	60577	Johnson, Dee	10,470.04
05/08/2017	60563	Central Marin Sanitation District	6,741.94
05/08/2017	60558	Aqua Science	5,650.00
05/08/2017	60604	W.R. Forde	2,986.71
05/08/2017	60594	Rauch Communication Consultants...	2,677.69
05/08/2017	60595	RMC Water & Environment, Inc.	2,500.36
05/08/2017	60566	Dearborn National	2,459.55
05/08/2017	60605	Water Environment & Reuse Foun...	2,277.00
05/08/2017	60559	Aries Industries Inc.	1,932.96
05/08/2017	60572	Grainger	1,306.02
05/08/2017	60582	Meyers, Nave, Riback, Silver & Wil...	1,150.00
05/08/2017	60602	Veolia Water Recycled Water Oper.	1,147.12
05/08/2017	60576	Jan-Pro Cleaning Systems	1,005.00
05/08/2017	60564	Cintas Corporation	969.93
05/08/2017	60561	Beecher Engineering, Inc	925.00
05/08/2017	60574	Herc Corporation	916.11
05/08/2017	60571	Frontier Analytical Laboratory, Inc.	800.00
05/08/2017	60590	Pace Supply, Inc.	793.26
05/08/2017	60580	Lightning Services, Inc.	679.00
05/08/2017	60584	North Marin Water District	659.42
05/08/2017	60556	Alpha Analytical Lab, Inc.	647.00
05/08/2017	60585	North Marin Water District - Lab	605.00
05/08/2017	60607	Marin IJ - Newspapers in Education	600.00
05/08/2017	60567	DKF Solutions Group, LLC	575.68
05/08/2017	60603	Vision Service Plan	570.58
05/08/2017	60598	U.S. Bank Card (3) Craig	525.08
05/08/2017	60562	BoundTree Medical, LLC	483.92
05/08/2017	60586	Novato Disposal-	254.44
05/08/2017	60565	Claremont EAP, Inc.	250.00
05/08/2017	60568	Evoqua Water Technologies - Lab	238.10
05/08/2017	60606	WECO	220.00
05/08/2017	60593	Pini Hardware	213.75
05/08/2017	60579	Leonardi Automotive & Electric, Inc.	150.96
05/08/2017	60589	Orkin Pest Control, Inc.	144.56
05/08/2017	60573	Hendricks, Aaron-	138.74
05/08/2017	60578	Krauthelm, Steve	116.87
05/08/2017	60588	O'Reilly Auto Parts	106.52
05/08/2017	60575	Honey Bucket	88.18
05/08/2017	60557	American Messaging	71.13
05/08/2017	60560	AT&T Mobility	63.32
05/08/2017	60599	United Parcel Service	43.04
05/08/2017	60570	First Alarm	39.91
05/08/2017	60583	NAPA Auto Parts	22.20
05/08/2017	60569	Federal Express	12.56
05/08/2017	60597	U.S. Bank (Sandeep)	12.49
05/08/2017	60581	Marin Independent Journal VOID	0.00
<b>May 8, 17</b>			<b>396,575.14</b>

# Novato Sanitary District Capital Projects Check Register

May 8, 2017

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Date	Num	Name	Credit
<b>May 8, 17</b>			
05/08/2017	3168	F.D. Thomas, Inc.	50,350.00
05/08/2017	3173	RMC Water & Environment, Inc.	44,770.81
05/08/2017	3169	Ghilotti Bros. Inc.	35,060.65
05/08/2017	3170	Lateral-Hartley	2,000.00
05/08/2017	3171	Meyers, Nave, Riback, Silver & ...	1,900.00
05/08/2017	3172	Nute Engineering Inc.	192.00
<b>May 8, 17</b>			<b><u>134,273.46</u></b>

## Novato Sanitary District Deposit Detail April 2017

Item 5.b.

Type	Date	Name	Account	Amount
<b>Deposit</b>	<b>04/07/2017</b>		<b>11113 · Westamerica - Operations</b>	
		Falzon, Frank	51020 · Connection Charges	10,160.00
TOTAL				10,160.00
<b>Deposit</b>	<b>04/11/2017</b>		<b>11113 · Westamerica - Operations</b>	
		CSRMA	(1) 66070 · Insurance	23,664.00
		North Marin Water District-	(2) 11200 - Accounts Receivable	6,882.29
		Biomarin	(3) 11200 - Accounts Receivable	5,111.55
TOTAL				35,657.84
<b>Deposit</b>	<b>04/12/2017</b>		<b>11113 · Westamerica - Operations</b>	
		USCG	11200 - Accounts Receivable	14,608.10
		USCG-Finance Center	11200 - Accounts Receivable	190.35
TOTAL				14,798.45
<b>Deposit</b>	<b>04/17/2017</b>		<b>11113 · Westamerica - Operations</b>	
		County of Marin (1)	(4) 51015 · Property Taxes	764,003.17
			41010 · Sewer Service Charges	3,566,879.89
			51010 · Sewer Service Charges	2,918,356.29
			66202 · County Fees - Property Taxes	-15,391.41
			66203 · County Fees - Sewer Service Chg	-7,200.00
			21045 · Novato Heights Debt Service	68,921.04
			21045 · Novato Heights Debt Service	-97.50
TOTAL				7,295,471.48
<b>Deposit</b>	<b>04/26/2017</b>		<b>11113 · Westamerica - Operations</b>	
		Peter Levi Plumbing	41040 · Permit & Inspection Fee	40.00
		Pipe Spy Marin	41040 · Permit & Inspection Fee	40.00
		Newell, Rob	41040 · Permit & Inspection Fee	40.00
		Biomarin	41090 · Non-domestic Permit Fees	175.00
		Creamer, Laura(reimb)	66090 · Office Expense	10.00
		Gopher It	41040 · Permit & Inspection Fee	40.00
		Giardini Landscaping	41040 · Permit & Inspection Fee	40.00
		John's Plumbing Service	41040 · Permit & Inspection Fee	40.00
		WEF Membership	66080 · Memberships	2,277.00
		SMART-	11200 - Accounts Receivable	30.09
TOTAL				2,732.09
<b><u>Total Deposits for April 2017</u></b>				<b><u>7,358,819.86</u></b>

- (1) Received dividend from CSRMA for Pooled Liability Policy.
- (2) Collection of Recycled Water Facility billings for November and December, previously collection only for October.
- (3) Collection of non domestic permit fees.
- (4) Second installment of property taxes and sewer services charges.

**Novato Sanitary District**

**QUARTERLY INVESTMENT REPORT -- For Quarter Ended March 31, 2017**

INVESTMENT	ACTIVITY	January	February	March	QTR TOTAL
STATE TREASURER'S INVESTMENT FUND	Total deposits/transfers in	128,315	0	300,000	<b>428,315</b>
	Total transfers out	1,904,000	939,000	837,000	<b>3,680,000</b>
	Minimum daily balance	17,372,432	16,433,432	16,433,432	<b>16,433,432</b>
Current Yield 0.821%	Maximum daily balance	19,148,117	17,372,432	15,896,432	<b>19,148,117</b>
	Interest earned			32,810	<b>32,810</b>
<b>TRUST ACCOUNT</b>					
BANK OF NEW YORK MELLON For COP Bond Funds	Total deposits/transfers in	0	0	0	<b>0</b>
	Total transfers out	0	0	0	<b>0</b>
	Minimum daily balance	1,693,944	1,693,959	1,693,977	<b>1,693,944</b>
	Maximum daily balance	1,693,959	1,693,977	1,693,990	<b>1,693,990</b>
	Interest earned	15	18	13	<b>46</b>
The LAIF Pooled Money Investment Account Report is attached as specified in California Government Code Section 53646(e)					
<b>CHECKING ACCOUNTS</b>					
Interest Rate	<b>Regular Warrants Account</b>				
0.02%	Total deposits & transfers in	2,189,575	988,083	1,322,365	<b>4,500,023</b>
	Total checks & transfers out	2,359,766	838,364	1,359,509	<b>4,557,639</b>
	Minimum daily balance	128,186	4,571	41,784	<b>4,571</b>
	Maximum daily balance	707,847	472,437	479,456	<b>707,847</b>
	Interest earned	6	2	4	<b>12</b>
	<b>Payroll Account</b>				
	Total transfers in	118,100	120,500	116,300	<b>354,900</b>
	Total checks & transfers out	118,501	120,426	116,346	<b>355,273</b>
	Minimum daily balance	120	303	502	<b>120</b>
	Maximum daily balance	106,731	106,914	106,613	<b>106,914</b>
	<b>Project Account</b>				
	Total transfers in	255,500	152,000	1,341,000	<b>1,748,500</b>
	Total checks & transfers out	465,703	76,342	1,668,681	<b>2,210,726</b>
	Minimum daily balance	4,780	130,249	128,099	<b>4,780</b>
	Maximum daily balance	349,716	224,752	1,432,428	<b>1,432,428</b>
	Interest earned	2	3	10	<b>15</b>

**NOTES:** (1) The above investments are consistent with the annual Statement of Investment Policy approved by the District Board, most recently May 2016.

The District has the ability to meet six months cash needs.

(2) LAIF interest rate is currently .821% which is an increase from .719% in December and .634% in September, .576% in June, and .51% in March 2016.



**JOHN CHIANG  
TREASURER  
STATE OF CALIFORNIA**



**PMIA Performance Report**

Date	Daily Yield*	Quarter to Date Yield	Average Maturity (in days)
03/14/17	0.82	0.77	193
03/15/17	0.82	0.77	191
03/16/17	0.82	0.77	190
03/17/17	0.83	0.77	190
03/18/17	0.83	0.77	190
03/19/17	0.83	0.78	190
03/20/17	0.83	0.78	188
03/21/17	0.83	0.78	185
03/22/17	0.83	0.78	184
03/23/17	0.83	0.78	184
03/24/17	0.83	0.78	186
03/25/17	0.83	0.78	186
03/26/17	0.83	0.78	186
03/27/17	0.83	0.78	181
03/28/17	0.83	0.78	180
03/29/17	0.84	0.78	180
03/30/17	0.85	0.78	181
03/31/17	0.85	0.78	180
04/01/17	0.86	0.86	181
04/02/17	0.86	0.86	181
04/03/17	0.86	0.86	183
04/04/17	0.86	0.86	184
04/05/17	0.86	0.86	184
04/06/17	0.87	0.86	181
04/07/17	0.87	0.86	181
04/08/17	0.87	0.86	181
04/09/17	0.87	0.86	181
04/10/17	0.87	0.86	181
04/11/17	0.87	0.87	181
04/12/17	0.87	0.87	183
04/13/17	0.88	0.87	182

\*Daily yield does not reflect capital gains or losses

[View Prior Month Daily Rates](#)

**LAIF Performance Report**

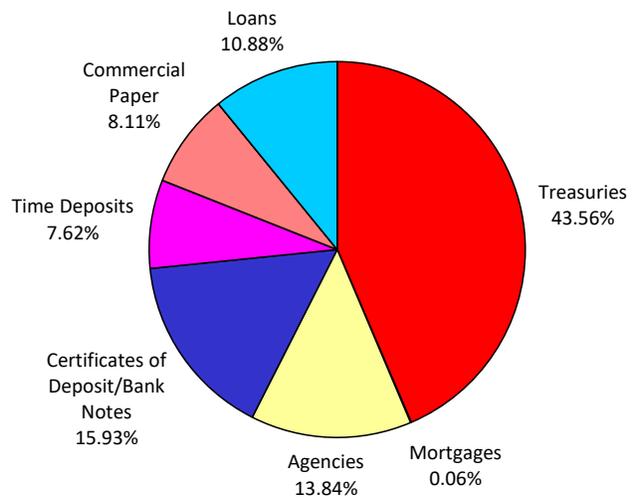
**Quarter Ending 03/31/17**

Apportionment Rate: 0.78%  
 Earnings Ratio: 0.00002126194403179  
 Fair Value Factor: 0.999175951  
     Daily: 0.85%  
 Quarter to Date: 0.78%  
 Average Life: 180

**PMIA Average Monthly Effective Yields**

**Mar 2017 0.821%**  
 Feb 2017 0.777%  
 Jan 2017 0.751%

**Pooled Money Investment Account  
Portfolio Composition  
03/31/17  
\$71.9 billion**





**State of California**  
**Pooled Money Investment Account**  
**Market Valuation**  
**3/31/2017**

Description	Carrying Cost Plus		Fair Value	Accrued Interest
	Accrued Interest	Purch. Amortized Cost		
1* United States Treasury:				
Bills	\$ 11,529,529,518.46	\$ 11,555,331,831.40	\$ 11,547,993,500.00	NA
Notes	\$ 19,784,669,253.72	\$ 19,783,508,723.77	\$ 19,749,210,500.00	\$ 33,930,754.00
1* Federal Agency:				
SBA	\$ 866,949,257.52	\$ 866,912,128.47	\$ 858,953,922.79	\$ 729,325.65
MBS-REMICs	\$ 44,788,917.08	\$ 44,788,917.08	\$ 47,053,192.13	\$ 211,005.30
Debentures	\$ 949,997,076.07	\$ 949,997,076.07	\$ 946,506,000.00	\$ 1,591,535.50
Debentures FR	\$ -	\$ -	\$ -	\$ -
Discount Notes	\$ 7,768,611,458.36	\$ 7,782,989,930.58	\$ 7,780,400,000.00	NA
GNMA	\$ -	\$ -	\$ -	\$ -
1* Supranational Debentures	\$ 299,965,313.04	\$ 299,965,313.04	\$ 298,392,500.00	\$ 492,013.50
1* Supranational Debentures FR	\$ 50,000,000.00	\$ 50,000,000.00	\$ 50,073,000.00	\$ 121,526.17
2* CDs and YCDs FR	\$ 300,000,000.00	\$ 300,000,000.00	\$ 300,000,000.00	\$ 670,902.50
2* Bank Notes	\$ 600,000,000.00	\$ 600,000,000.00	\$ 599,607,935.89	\$ 1,439,055.55
2* CDs and YCDs	\$ 10,550,000,000.00	\$ 10,550,000,000.00	\$ 10,547,089,360.14	\$ 25,231,888.90
2* Commercial Paper	\$ 5,830,869,194.46	\$ 5,839,554,041.75	\$ 5,838,495,499.98	NA
1* Corporate:				
Bonds FR	\$ -	\$ -	\$ -	\$ -
Bonds	\$ -	\$ -	\$ -	\$ -
1* Repurchase Agreements	\$ -	\$ -	\$ -	\$ -
1* Reverse Repurchase	\$ -	\$ -	\$ -	\$ -
Time Deposits	\$ 5,480,740,000.00	\$ 5,480,740,000.00	\$ 5,480,740,000.00	NA
AB 55 & GF Loans	\$ 7,824,657,000.00	\$ 7,824,657,000.00	\$ 7,824,657,000.00	NA
<b>TOTAL</b>	<b>\$ 71,880,776,988.71</b>	<b>\$ 71,928,444,962.16</b>	<b>\$ 71,869,172,410.93</b>	<b>\$ 64,418,007.07</b>

Fair Value Including Accrued Interest

\$ 71,933,590,418.00

\* Governmental Accounting Standards Board (GASB) Statement #72

Repurchase Agreements, Time Deposits, AB 55 & General Fund loans, and Reverse Repurchase agreements are carried at portfolio book value (carrying cost).

The value of each participating dollar equals the fair value divided by the amortized cost (**0.999175951**).  
 As an example: if an agency has an account balance of \$20,000,000.00, then the agency would report its participation in the LAIF valued at \$19,983,519.02 or \$20,000,000.00 x **0.999175951**.



## PAR VALUES MATURING BY DATE AND TYPE

### Maturities in Millions of Dollars

ITEM	1 day to 30 days	31 days to 60 days	61 days to 90 days	91 days to 120 days	121 days to 150 days	151 days to 180 days	181 days to 210 days	211 days to 270 days	271 days to 1 year	1 year to 2 years	2 years to 3 years	3 years to 4 years	4 years to 5 year/out
TREASURY	\$ 1,250	\$ 300	\$ 4,050	\$ 4,150	\$ 1,300	\$ 1,500	\$ 1,500	\$ 1,550	\$ 7,000	\$ 7,100	\$ 1,700		
REPO													
TDs	\$ 1,715	\$ 1,134	\$ 1,278	\$ 635	\$ 338	\$ 382							
AGENCY	\$ 2,017	\$ 1,400	\$ 500	\$ 1,400	\$ 700	\$ 1,400	\$ 700	\$ 750	\$ 627	\$ 1,281	\$ 250	\$ 50	
CP	\$ 1,850	\$ 1,900	\$ 450	\$ 700	\$ 400	\$ 350	\$ 200						
CDs + BNs	\$ 2,750	\$ 3,600	\$ 700	\$ 2,850		\$ 650	\$ 400	\$ 200	\$ 300				
CORP BND													
<b>TOTAL</b>													
\$ 65,256	\$ 9,582	\$ 8,334	\$ 6,978	\$ 9,735	\$ 2,738	\$ 4,282	\$ 2,800	\$ 2,500	\$ 7,927	\$ 8,381	\$ 1,950	\$ 50	\$ -
PERCENT	14.7%	12.8%	10.7%	14.9%	4.2%	6.6%	4.3%	3.8%	12.1%	12.8%	3.0%	0.1%	0.0%

Notes:

1. SBA Floating Rate Securities are represented at coupon change date.
2. Mortgages are represented at current book value.
3. Figures are rounded to the nearest million.
4. Does not include AB55 and General Fund loans.

# NOVATO SANITARY DISTRICT

## MEMORANDUM

**BOARD**

**MEETING DATE:** May 8, 2017

**TO:** District Board of Directors

**FROM:** Sandeep Karkal, General Manager-Chief Engineer  
Laura M. Creamer, Finance Officer

**SUBJECT:** Fiscal Year (FY) 16-17 Third Quarter Financial Report

### INTRODUCTION

This memorandum presents a summary year-to-date financial report for the District as of the FY16-17 Third Quarter ended March 31, 2017. The following items are presented as two sections herein:

1. Revenue and Expenditure Report (for the quarter ended March 31, 2017).
2. Debt Service Schedule as of March 31, 2017.
3. Operating and Capital Cash Flow for July 1, 2016 – March 31, 2017.

### 1.0 REVENUE AND EXPENDITURES REPORT

This section presents an overview of revenues and expenditures for the operating and capital funds through the third quarter of Fiscal Year 2016-17. A more detailed summary is presented in the attached tables titled “DRAFT – Revenues and Expenditures – Budget vs. Actual”. A brief discussion and analysis of items displaying variance from the final budget is also provided below, as appropriate.

### OPERATING FUND

**Table 1: OPERATING REVENUE**

	YTD Balance Received	Annual Budget	Budget Remaining	Pct. Received
<b>Total Operating Revenues</b>	\$5,872,301	\$10,108,692	\$4,236,391	58.1%

### Discussion

Overall, operating revenues are approximately 58.1% of the total budget amount with 75% of the year complete. The operating revenue accounts are within the normal range for this time of year, since the District receives its primary revenues in December and April.

**Table 2: OPERATING EXPENDITURES**

	<b>YTD Balance</b>	<b>Annual Budget</b>	<b>Budget Unused</b>	<b>Pct. Used</b>
<b>Total Operating Expenditures</b>	\$ 6,212,574	\$9,972,648	\$3,760,074	62.3%

**Discussion**

Overall, operating expenditures are at approximately 62.3% of budget, with 75% of the year complete. Variances in individual expenditure accounts are discussed below:

**Collection System (56.6%)**

General: In general, no significant variances noted for this cost center for the third quarter. Variances in individual expenditure accounts are discussed below.

Safety: 80.4% Variance on a small budget of \$3,500 - most of these safety related purchases have been made for this fiscal year. Account expected to stay within budget for the current fiscal year.

**Treatment Facilities - Contract Operations: (66.6%)**

General: In general, no significant variances noted for this cost center for the third quarter.

**Reclamation/Disposal Facilities: (80.7%)**

General: In general, no significant variances noted for this cost center for the third quarter. Variances in individual expenditure accounts are discussed below.

Sludge Disposal: 99.4%. Sludge disposal is completed for the year. Account expected to stay within budget for the current fiscal year.

Repairs & Maintenance: 82.4%. Variance is due to the seasonal nature of the reclamation facility's irrigation activities. Per review of account, no significant items noted, and account is expected to stay within budget for the current fiscal year.

Gas & Electricity: 90.4%. Significant variance, primarily from the above normal winter rainfall resulting in higher than expected run times at the drainage stations, and the account is expected to go slightly over estimated budget amount for the current fiscal year.

Water: 93.1%. Water is a reimbursable expenditure billed and paid by the rancher at the end of the fiscal year. Account expected to stay within budget for the current fiscal year.

**Laboratory/Monitoring: (57.3%)**

General: In general, no significant variances noted for this cost center for the third quarter. Variances in individual expenditure accounts are discussed below.

Permits & Fees. 118.5%. Significant variance on a small budget amount of \$3,000 – variance primarily due to the annual permit fee for the California Environmental Laboratory Accreditation Program (ELAP) increasing about \$600 from the prior fiscal year.

**Pump Stations: (61.2%)**

General: In general, no significant variances noted for this cost center for the third quarter.

**Administration and Engineering: (60.8%)**

General: In general, no significant variances noted for this cost center for the third quarter. Variances in individual expenditure accounts are discussed below.

Insurance: 100.3%. Insurance expenses are within expected parameters for this time of year, typically paid as billed in the first and second quarter of the fiscal year. Account expected to stay within budget for the current fiscal year when the District receives its annual Pooled Liability Program (PLP) dividend from CSRMA in April, which will offset the account balance.

Agency Dues: 91.1%. Agency dues paid for this fiscal year. Account expected to stay within budget for the current fiscal year.

Memberships: 86.2%. Significant variance due to nature of account; most membership fees have been paid by this time of the year. Account expected to stay within budget for the current fiscal year.

Accounting & Auditing: 90.7%. Significant variance due completion of audit for FY15-16. Account expected to stay within budget for the current fiscal year.

**AB 939 Solid Waste Programs: (47.5%)**

General: In general, no significant variances noted for this cost center for the third quarter.

**Recycled Water: (62.3%)**

General: In general, no significant variances noted for this cost center for the third quarter. Variances in individual expenditure accounts are discussed below.

**Gas & Electricity:** 726.6%. Currently, significant variance due to small budget amount (\$2,000). Note that this \$2,000 budget amount was an estimated budget amount for utilities' costs for operation of the Deer Island recycled water facility only. However, the expense as currently shown is for annual operation of the Deer Island recycled water facility as well as the Novato Treatment Plant (NTP) Recycled Water Facility. In prior years, utilities' expenses for the NTP Recycled Water Facility (RWF) were estimated based on equipment run times and usage, and budgeted and expensed within the utilities' budget for the entire NTP including the NTP RWF (i.e. under Account 61000-5). With recent software updates, Veolia staff is now able to break out utilities' costs related to the NTP RWF. Therefore, for the current budget year, the budget amount within the Recycled Water Cost Center for Account No. 68191 will be "trued-up" using Policy No. 3512: Annual Budget - Non-Personnel Related Changes to Budget Amounts, at the end of FY16-17. Going forward, in future budget years, the NTP RWF Gas & Electricity budget line item (i.e. Account No. 68191) will reflect an allocation for utilities' charges for the NTP RWF, and continue to include an allocation for the Deer Island facility. **Note also that these expenses are "pass-through costs" to the North Marin Water District (NMWD) and reimbursed as such to the District by NMWD.**

**CAPITAL FUND**

**Table 3: CAPITAL REVENUE**

Capital Revenue	YTD Balance Received	Annual Budget	Over/(Under) Budget	Pct. Received
<b>Sewer Service Charges</b>	\$4,162,871	\$7,595,952	(\$3,433,081)	54.8%
<b>Property Taxes</b>	1,289,490	1,938,000	(648,510)	66.5%
<b>Connection Charges</b>	143,015	434,400	(291,384)	32.9%
<b>Collector Sewer/Special Equalization Charges</b>	0	2,000	(2,000)	0.00%
<b>Interest</b>	25,312	25,000	312	101.3%
<b>Other Revenue <sup>(1)</sup></b>	227,891 <sup>(1)</sup>	20,000	207,891	1,139.5% <sup>(1)</sup>
<b>Total Revenue</b>	<b>\$5,848,580</b>	<b>\$10,015,352</b>	<b>(\$4,166,772)</b>	<b>58.4%</b>

(1) Includes \$225,000 for settlement of the Bayside matter - see Discussion below.

**Discussion**

Overall capital revenues are 58.4% of budget at the close of the third quarter, consistent with the District receiving the bulk of its revenue in December and April. Of note, connection charges (collected on an ongoing basis through the year) are trending significantly lower than expected, from muted development. Also, property tax revenue, which is received only twice a year (in December and April), may end being higher than anticipated, due to increased property values. In addition, the "Other Revenue" item is

significantly higher than budgeted due to the resolution of the long-standing Bayside (Hamilton area) sub-division matter, and acceptance of the Bayside sewer system by the District in consideration of a settlement amount of \$225,000 to the District from the Bayside developer.

**Table 4: CAPITAL EXPENDITURES**

	<b>YTD Balance</b>	<b>Annual Budget</b>	<b>Budget Unused</b>	<b>Pct. Used</b>
<b>Capital Expenditures</b>	\$8,526,747	\$11,734,705	(\$3,207,958)	72.7%

**Discussion**

The list of capital project accounts is shown in the attached tables. Overall expenses are 72.7% of budget. As noted in prior reports, capital work follows a different spending trajectory than normal operating expenditures. All of these accounts are expected to stay within budget over the remainder of the fiscal year.

The principal and interest accounts for repayment of the District's outstanding State Revolving Fund (SRF) loan and 2011 Certificates of Participation (COPs) are within budget for this time of year.

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**Novato Sanitary District**  
**DRAFT - Revenues & Expenditures Budget vs. Actual**  
July 2016 through March 2017

	Jul '16 - Mar 17	Budget	\$ Over Budget	% of Budget
<b>41000 · OPERATING REVENUE</b>				
41010 · Sewer Service Charges	5,303,558.42	9,208,992.00	(3,905,433.58)	57.59%
41030 · Plan Check & Inspection Fee	25.00	500.00	(475.00)	5.0%
41040 · Permit & Inspection Fee	5,170.00	6,000.00	(830.00)	86.17%
41060 · Interest Income	30,767.34	20,000.00	10,767.34	153.84%
41080 · Engineering & Admin Charges	8,361.79	165,000.00	(156,638.21)	5.07%
41090 · Non-domestic Permit Fees	11,520.56	25,000.00	(13,479.44)	46.08%
41100 · Garbage Franchise Fees	26,392.00	52,186.00	(25,794.00)	50.57%
41105 · AB 939 Collector Fees	265,600.50	354,134.00	(88,533.50)	75.0%
41107 · Oil/Bev/Tire Grants	9,375.15	59,880.00	(50,504.85)	15.66%
41130 · Ranch Income	54,369.98	70,000.00	(15,630.02)	77.67%
41135 · Recycle Water Facility Revenue	141,155.13	117,000.00	24,155.13	120.65%
41140 · Other Revenue	14,377.90	20,000.00	(5,622.10)	71.89%
41142 · Loss on disposal of assets	1,627.00	10,000.00	(8,373.00)	16.27%
<b>Total 41000 · OPERATING REVENUE</b>	<b>5,872,300.77</b>	<b>10,108,692.00</b>	<b>(4,236,391.23)</b>	<b>58.09%</b>
<b>Expense</b>				
<b>60000 · COLLECTION SYSTEM</b>				
60010 · Salaries & Wages	413,564.75	627,355.00	(213,790.25)	65.92%
60020 · Employee Benefits	187,700.69	286,293.00	(98,592.31)	65.56%
60060 · Gas, Oil & Fuel	8,988.07	28,000.00	(19,011.93)	32.1%
60085 · Safety	2,813.47	3,500.00	(686.53)	80.39%
60091 · Software Maint	18,690.50	75,000.00	(56,309.50)	24.92%
60100 · Operating Supplies	14,285.62	30,000.00	(15,714.38)	47.62%
60150 · Repairs & Maintenance	36,664.62	85,000.00	(48,335.38)	43.14%
60152 · Small Tools	914.39	2,000.00	(1,085.61)	45.72%
60153 · Outside Services	79,670.60	175,000.00	(95,329.40)	45.53%
60192 · Water	6,200.64	12,000.00	(5,799.36)	51.67%
60193 · Telephone	1,261.47	2,000.00	(738.53)	63.07%
60200 · Other(Garbage Coll)	163.56	1,000.00	(836.44)	16.36%
60201 · Permits & Fees	16,563.22	65,000.00	(48,436.78)	25.48%
<b>Total 60000 · COLLECTION SYSTEM</b>	<b>787,481.60</b>	<b>1,392,148.00</b>	<b>(604,666.40)</b>	<b>56.57%</b>
<b>61000-0 · Contract Operations</b>				
61000-1 · Fixed Fee	1,527,842.88	2,113,278.00	(585,435.12)	72.3%
61000-2 · Insurance & Bonds	6,749.18	14,000.00	(7,250.82)	48.21%
61000-3 · Major Repair/Replacement	0.00	150,000.00	(150,000.00)	0.0%
61000-4 · Water/Permits/Telephone	60,222.35	90,000.00	(29,777.65)	66.91%
61000-5 · Gas & Electricity	454,028.15	708,913.00	(254,884.85)	64.05%
<b>Total 61000-0 · Contract Operations</b>	<b>2,048,842.56</b>	<b>3,076,191.00</b>	<b>(1,027,348.44)</b>	<b>66.6%</b>
<b>63000 · RECLAMATION/DISPOSAL</b>				
63010 · Salaries & Wages	62,855.81	91,943.00	(29,087.19)	68.36%
63020 · Employee Benefits	16,093.63	36,595.00	(20,501.37)	43.98%
63060 · Gasoline & Oil	1,285.51	4,000.00	(2,714.49)	32.14%
63085 · Safety	0.00	500.00	(500.00)	0.0%

**Novato Sanitary District**  
**DRAFT - Revenues & Expenditures Budget vs. Actual**  
July 2016 through March 2017

	Jul '16 - Mar 17	Budget	\$ Over Budget	% of Budget
<b>63091 · Software Maintenance</b>	1,000.00	2,000.00	(1,000.00)	50.0%
<b>63100 · Operating Supplies</b>	1,422.44	2,000.00	(577.56)	71.12%
<b>63115 · Sludge Disposal</b>	188,818.87	190,000.00	(1,181.13)	99.38%
<b>63150 · Repairs &amp; Maintenance</b>	57,661.00	70,000.00	(12,339.00)	82.37%
<b>63152 · Small Tools</b>	68.65	500.00	(431.35)	13.73%
<b>63157 · Ditch/Dike Maintenance</b>	0.00	20,000.00	(20,000.00)	0.0%
<b>63191 · Gas &amp; Electricity</b>	85,893.87	95,000.00	(9,106.13)	90.42%
<b>63192 · Water - Reclamation</b>	2,791.54	3,000.00	(208.46)	93.05%
<b>63201 · Permits &amp; Fees</b>	2,995.40	6,000.00	(3,004.60)	49.92%
<b>Total 63000 · RECLAMATION/DISPOSAL</b>	420,886.72	521,538.00	(100,651.28)	80.7%
<b>64000 · LABORATORY/MONITORING</b>				
<b>64010 · Contract Lab Services</b>	253,688.45	368,136.00	(114,447.55)	68.91%
<b>64060 · Gasoline &amp; Oil</b>	877.14	2,500.00	(1,622.86)	35.09%
<b>64085 · Safety</b>	0.00	1,000.00	(1,000.00)	0.0%
<b>64091 · Software Maintenance</b>	0.00	4,000.00	(4,000.00)	0.0%
<b>64100 · Operating Supplies</b>	12,028.51	20,000.00	(7,971.49)	60.14%
<b>64150 · Repairs &amp; Maintenance</b>	4,963.81	25,000.00	(20,036.19)	19.86%
<b>64160 · Research &amp; Monitoring</b>	81,018.71	182,000.00	(100,981.29)	44.52%
<b>64170 · Pollution Prevention/Public Ed</b>	15,750.31	43,000.00	(27,249.69)	36.63%
<b>64201 · Permits &amp; Fees</b>	3,555.00	3,000.00	555.00	118.5%
<b>Total 64000 · LABORATORY/MONITORING</b>	371,881.93	648,636.00	(276,754.07)	57.33%
<b>65000 · PUMP STATIONS</b>				
<b>65010 · Salaries &amp; Wages</b>	225,716.31	344,528.00	(118,811.69)	65.52%
<b>65020 · Employee Benefits</b>	85,703.76	154,611.00	(68,907.24)	55.43%
<b>65060 · Gasoline &amp; Oil</b>	1,926.00	6,000.00	(4,074.00)	32.1%
<b>65085 · Safety Expenses</b>	1,236.39	2,000.00	(763.61)	61.82%
<b>65091 · Software Maintenance</b>	5,493.69	12,000.00	(6,506.31)	45.78%
<b>65100 · Operating Supplies</b>	4,030.18	10,000.00	(5,969.82)	40.3%
<b>65101 · Operating Chemicals</b>	28.26	15,000.00	(14,971.74)	0.19%
<b>65150 · Repairs &amp; Maintenance</b>	79,139.02	115,000.00	(35,860.98)	68.82%
<b>65152 · Small Tools</b>	792.74	2,000.00	(1,207.26)	39.64%
<b>65153 · Outside Services, Electrical</b>	6,915.64	35,000.00	(28,084.36)	19.76%
<b>65191 · Gas &amp; Electricity</b>	83,513.90	110,000.00	(26,486.10)	75.92%
<b>65192 · Water</b>	4,725.35	7,000.00	(2,274.65)	67.51%
<b>65193 · Telephone</b>	16,440.72	24,000.00	(7,559.28)	68.5%
<b>65201 · Permits &amp; Fees</b>	7,060.71	17,000.00	(9,939.29)	41.53%
<b>Total 65000 · PUMP STATIONS</b>	522,722.67	854,139.00	(331,416.33)	61.2%
<b>66000 · ADMIN/ENGINEERING</b>				
<b>66010 · Salaries &amp; Wages</b>	737,546.85	1,152,160.00	(414,613.15)	64.01%
<b>66020 · Employee Benefits</b>	333,403.15	473,551.00	(140,147.85)	70.41%
<b>66021 · Retiree Health Benefits</b>	129,774.48	377,348.00	(247,573.52)	34.39%
<b>66030 · Director's Fees</b>	15,975.00	38,000.00	(22,025.00)	42.04%
<b>66060 · Gasoline &amp; Oil</b>	3,668.96	10,000.00	(6,331.04)	36.69%

**Novato Sanitary District**  
**DRAFT - Revenues & Expenditures Budget vs. Actual**  
July 2016 through March 2017

	Jul '16 - Mar 17	Budget	\$ Over Budget	% of Budget
<b>66070 · Insurance</b>	150,485.85	150,000.00	485.85	100.32%
<b>66071 · Insurance Claim Expense</b>	18,442.87	50,000.00	(31,557.13)	36.89%
<b>66075 · Agency Dues</b>	56,448.75	62,000.00	(5,551.25)	91.05%
<b>66080 · Memberships</b>	8,623.60	10,000.00	(1,376.40)	86.24%
<b>66085 · Safety</b>	695.28	2,000.00	(1,304.72)	34.76%
<b>66090 · Office Expense</b>	18,575.95	27,000.00	(8,424.05)	68.8%
<b>66100 · Engineering Supplies</b>	5,787.06	10,000.00	(4,212.94)	57.87%
<b>66121 · Accounting &amp; Auditing</b>	24,499.00	27,000.00	(2,501.00)	90.74%
<b>66122 · Attorney Fees</b>	10,066.82	75,000.00	(64,933.18)	13.42%
<b>66123 · O/S Contractual</b>	123,007.09	218,000.00	(94,992.91)	56.43%
<b>66124 · IT/Misc Electrical</b>	22,681.49	45,000.00	(22,318.51)	50.4%
<b>66125 · Safety &amp; Wellness Incentive Pro</b>	3,450.00	10,000.00	(6,550.00)	34.5%
<b>66130 · Printing &amp; Publications</b>	9,039.33	22,000.00	(12,960.67)	41.09%
<b>66150 · Repairs &amp; Maintenance</b>	35,229.84	50,000.00	(14,770.16)	70.46%
<b>66170 · Travel, Meetings &amp; Training</b>	41,415.40	55,000.00	(13,584.60)	75.3%
<b>66193 · Telephone</b>	7,253.83	10,000.00	(2,746.17)	72.54%
<b>66202 · County Fees - Property Taxes</b>	15,391.41	26,000.00	(10,608.59)	59.2%
<b>66203 · County Fees - Sewer Service Chg</b>	21,600.00	42,000.00	(20,400.00)	51.43%
<b>66250 · Service Charge Sys Exp</b>	0.00	5,150.00	(5,150.00)	0.0%
<b>Total 66000 · ADMIN/ENGINEERING</b>	1,793,062.01	2,947,209.00	(1,154,146.99)	60.84%
<b>67000 · AB 939 SOLID WASTE PROGRAMS</b>				
<b>67400 · Consulting Services</b>	56,400.88	134,750.00	(78,349.12)	41.86%
<b>67500 · Household Hazardous Waste</b>	128,420.36	220,000.00	(91,579.64)	58.37%
<b>67530 · Used Oil/Beverage Cont Grant</b>	3,330.00	22,537.00	(19,207.00)	14.78%
<b>67540 · Outreach/Publicity/Education</b>	9,312.44	23,500.00	(14,187.56)	39.63%
<b>67600 · Other</b>	0.00	5,000.00	(5,000.00)	0.0%
<b>67610 · City AB 939 Admin Services</b>	0.00	10,000.00	(10,000.00)	0.0%
<b>Total 67000 · AB 939 SOLID WASTE PROGRAMS</b>	197,463.68	415,787.00	(218,323.32)	47.49%
<b>68000 · Recycled Water</b>				
<b>68010 · O &amp; M Services</b>	21,895.50	50,000.00	(28,104.50)	43.79%
<b>68100 · Operating Supplies</b>	1,611.95	2,000.00	(388.05)	80.6%
<b>68101 · Operating Chemicals</b>	15,077.57	26,000.00	(10,922.43)	57.99%
<b>68150 · Repairs &amp; Maintenance</b>	11,121.02	22,000.00	(10,878.98)	50.55%
<b>68160 · Research &amp; Monitoring</b>	5,995.00	14,000.00	(8,005.00)	42.82%
<b>68191 · Gas &amp; Electricity</b>	14,532.12	2,000.00	12,532.12	726.61%
<b>68201 · Permits &amp; Fees</b>	0.00	1,000.00	(1,000.00)	0.0%
<b>Total 68000 · Recycled Water</b>	70,233.16	117,000.00	(46,766.84)	60.03%
<b>Total Expense</b>	<b>6,212,574.33</b>	<b>9,972,648.00</b>	<b>(3,760,073.67)</b>	<b>62.3%</b>
<b>Net Ordinary Income(Loss)</b>	<b>(340,273.56)</b>	<b>136,044.00</b>	<b>(476,317.56)</b>	<b>(250.12%)</b>

**Novato Sanitary District**  
**DRAFT Revenues & Expenditures - Capital**  
 July 2016 through March 2017

	Jul '16 - Mar 17	Budget	\$ Over Budget	% of Budget
<b>Income</b>				
<b>51000 · CAPITAL IMPROVEMENT INCOME</b>				
51010 · Sewer Service Charges	4,162,871.02	7,595,952.00	(3,433,080.98)	54.8%
51015 · Property Taxes	1,289,489.74	1,938,000.00	(648,510.26)	66.54%
51020 · Connection Charges	143,015.80	434,400.00	(291,384.20)	32.92%
51030 · Collector Sewer Charges	0.00	1,000.00	(1,000.00)	0.0%
51040 · Special Equalization Charge	0.00	1,000.00	(1,000.00)	0.0%
51060 · Interest	25,312.53	25,000.00	312.53	101.25%
51070 · Other Revenue	227,890.72	20,000.00	207,890.72	1,139.45%
<b>Total 51000 · CAPITAL IMPROVEMENT INCOME</b>	<b>5,848,579.81</b>	<b>10,015,352.00</b>	<b>(4,166,772.19)</b>	<b>58.4%</b>
<b>Expense</b>				
<b>72000 · CAPITAL IMPROVEMENT PROJECTS</b>				
72403 · Pump Station Rehabilitation	0.00	50,000.00	(50,000.00)	0.0%
72508 · N. Bay Water Recycling Auth	207,344.00	440,000.00	(232,656.00)	47.12%
<b>72706 · Collection System Improv</b>				
72706-1 · Lateral Replacement Program	40,500.00	60,000.00	(19,500.00)	67.5%
72706 · Collection System Improv - Other	811,026.23	1,200,000.00	(388,973.77)	67.59%
72707 · Hamilton Wetlands/Outfall Monit	0.00	10,000.00	(10,000.00)	0.0%
72708 · Cogeneration	20,230.00	45,000.00	(24,770.00)	44.96%
72802 · Annual Sewer Adj. for City Proj	0.00	10,000.00	(10,000.00)	0.0%
72803 · Annual Collection Sys Repairs	37,543.23	200,000.00	(162,456.77)	18.77%
72804 · Annual Reclamation Fac Imp	52,355.94	100,000.00	(47,644.06)	52.36%
72805 · Annual Treatment Plnt Improv	49,338.20	100,000.00	(50,661.80)	49.34%
72806 · Annual Pump Station Improv	47,083.69	100,000.00	(52,916.31)	47.08%
72808 · Strategic Plan Update	0.00	20,000.00	(20,000.00)	0.0%
72809 · Novato Creek Watershed	0.00	10,000.00	(10,000.00)	0.0%
73003 · Admin Bldg/Maint.Bldg Upgrades	20,786.26	350,000.00	(329,213.74)	5.94%
73004 · Odor Control & NTP Landscaping	46,316.34	75,000.00	(28,683.66)	61.76%
73005 · RWF Expansion	120,272.70	1,300,000.00	(1,179,727.30)	9.25%
73006 · NTP Corrosion Control	14,246.99	180,000.00	(165,753.01)	7.92%
73090 · Vehicle Replacement	0.00	425,000.00	(425,000.00)	0.0%
<b>Total 72000 · CAPITAL IMPROVEMENT PROJECTS</b>	<b>1,467,043.58</b>	<b>4,675,000.00</b>	<b>(3,207,956.42)</b>	<b>31.38%</b>
<b>78400 · Principal and Interest</b>				
78500 · Interest - Capital Projects	2,385,942.17	2,385,943.00	(0.83)	100.0%
78501 · Principal - Capital Projects	4,673,761.52	4,673,762.00	(0.48)	100.0%
<b>Total 78400 · Principal and Interest</b>	<b>7,059,703.69</b>	<b>7,059,705.00</b>	<b>(1.31)</b>	<b>100.0%</b>
<b>Total Expense</b>	<b>8,526,747.27</b>	<b>11,734,705.00</b>	<b>(3,207,957.73)</b>	<b>72.66%</b>
<b>Net Ordinary Income</b>	<b>(2,678,167.46)</b>	<b>(1,719,353.00)</b>	<b>(958,814.46)</b>	<b>155.77%</b>

**Novato Sanitary District  
State Revolving Fund Loan Payable  
and  
COP Bond Payable Balances**

**2.0 Debt Service Schedule as of March 31, 2017**

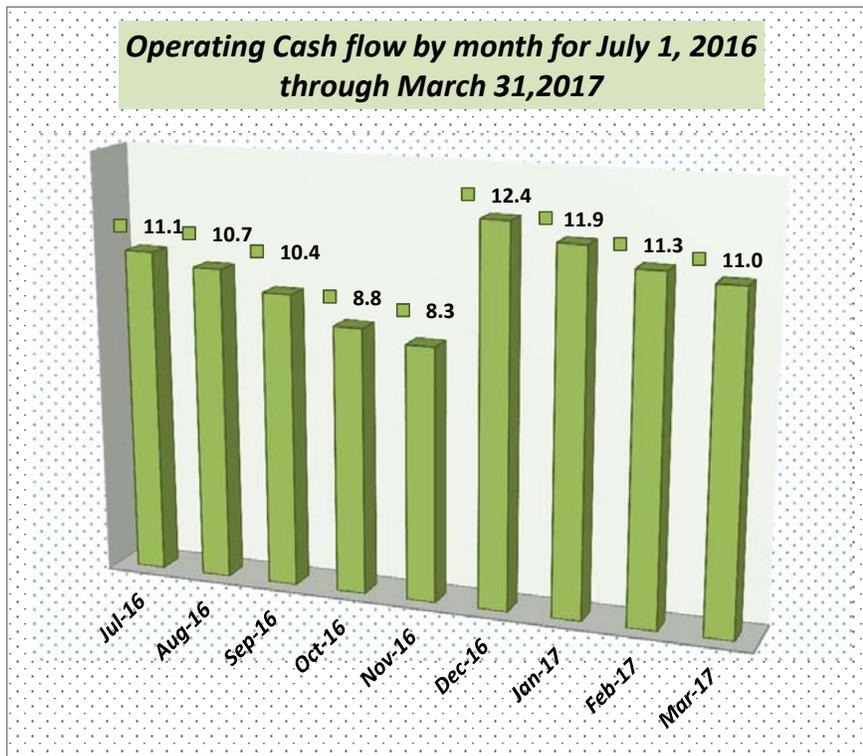
	<b><u>State Revolving Fund Loan</u></b>		
		<b>Principal</b>	<b>Interest</b>
	<b>SRF Loan Payable 6/30/16.....</b>	67,091,444	
	Principal Payment 2016-17	(3,768,761)	
	Interest payments 2016-17		(1,610,195)
	<b>SRF Loan Balance/Interest Paid 3/31/17.....</b>	<b>63,322,683</b>	<b>(1,610,195)</b>
	<b><u>COP Bond Financing Issued October 2011</u></b>		
	<b>COP Payable Balance 6/30/16.....</b>	18,380,000	
	Principal Payment 2016-17	(905,000)	
	Interest payments 2016-17		(387,874)
			(387,874)
	<b>COP Payable Balance/Interest Paid 3/31/17.....</b>	<b>17,475,000</b>	<b>(775,748)</b>
	Note:Principal and Interest payment for SRF Loan Payable paid for fiscal year.		
	Principal and Interest payment for COP Bond Payable paid for fiscal year.		

### 3.0 OPERATING AND CAPITAL CASH FLOW

Operating:  
**Cash Flow For Novato Sanitary District**  
**July 1, 2016 - March 31, 2017**  
**Dated: May 8, 2017**

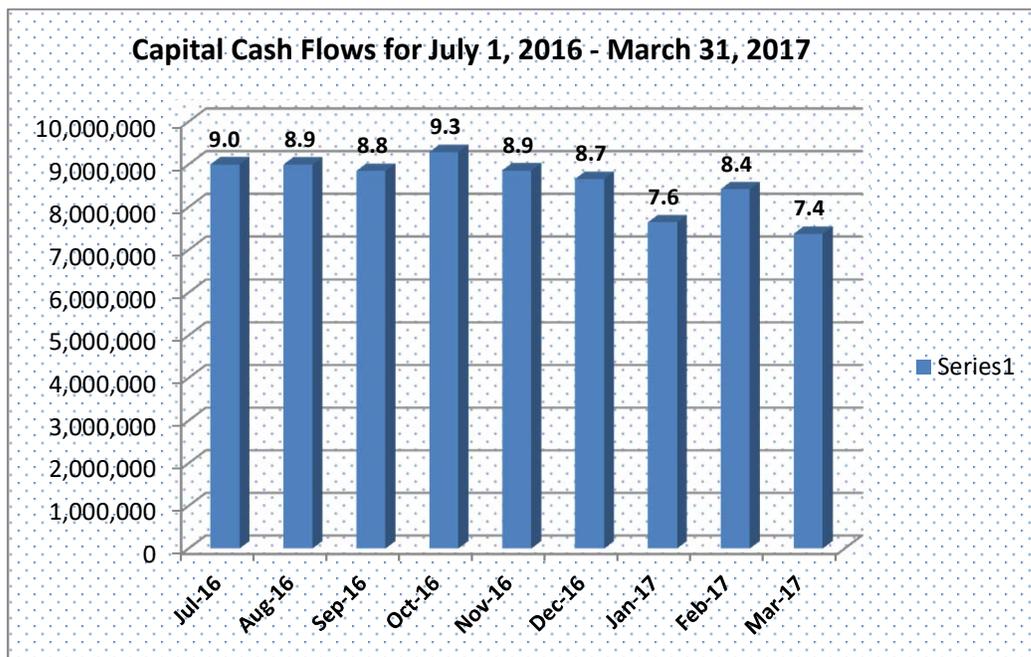
Month Earned	Operating Revenue	Monthly Operating Expenditures	Cash Balance
			* \$ 11,452,761
Jul-16	\$ 27,853	\$ 752,224	10,728,390
Aug-16	117,540	516,110	10,329,820
Sep-16	26,058	673,323	9,682,555
Oct-16	86,271	984,512	8,784,314
Nov-16	243,366	639,351	8,388,329
Dec-16	4,948,786	858,091	12,479,024
Jan-17	166,448	743,015	11,902,457
Feb-17	11,603	636,463	11,277,597
Mar-17	368,425	641,293	11,004,729

Note: Cash balances at year end split 55/45 - Operating/Capital based on split sewer service charges.  
 \* Beginning balance adjusted for accrual vs cash basis differences.



**Capital:**  
**Cash Flow For Novato Sanitary District**  
**July 1, 2016 - March 31, 2017**  
**Dated: May 8, 2017**

Month Earned	Monthly Operating Expenditures	Debt Service	Capital Revenue	Cash Balance
Jul-16	\$ 261,238	\$ 387,874	\$ 6,426	\$ 9,646,171
Aug-16	167,496		159,328	9,003,485
Sep-16	176,966		21,781	8,995,317
Oct-16	96,314		392,343	8,848,300
Nov-16	31,307		44,755	9,291,346
Dec-16	414,242	5,378,956	5,163,391	8,861,748
Jan-17	49,468	1,292,874	128,227	8,661,539
Feb-17	275,957		36,013	7,647,633
Mar-17	383,998		113,175	8,421,595
				7,376,810



# NOVATO SANITARY DISTRICT BOARD AGENDA ITEM SUMMARY

<b>TITLE:</b> Consent Calendar: District Statement of Investment Policy – Policy 3120: Investment of Public Funds	<b>MEETING DATE:</b> May 8, 2017  <b>AGENDA ITEM NO.:</b> 5.e.
<b>RECOMMENDED ACTION:</b> Ratify District Statement of Investment Policy, Policy 3120 - Investment of Public Funds.	
<b>SUMMARY AND DISCUSSION:</b>  The District Board periodically reviews and adopts or ratifies the District's Statement of Investment Policy in accordance with Government Code Section 53600. The policy was adopted in its current form as Policy 3120 – Investment of Public Funds, in December 2012, and updated in March 2014.  There is no proposed change to the Policy at this time. A copy of the Policy is attached. It is recommended that the Board ratify the District's current Statement of Investment Policy – Policy 3120: Investment of Public Funds.	
<b>ATTACHMENTS:</b> 1. District Statement of Investment Policy, Policy 3120 - Investment of Public Funds.	
<b>STRATEGIC PLAN INFORMATION:</b> This item addresses Goal 4 (Well Planned Finances with a Long-Range Outlook) of the latest Strategic Plan Update.	
<b>DEPT. MGR.:</b> lc, ssk	<b>GENERAL MANAGER:</b> SSK

# Novato Sanitary District

## POLICY HANDBOOK

**POLICY TITLE:** Investment of District Funds  
**POLICY NUMBER:** 3120  
**ADOPTED/REVISED:** December 10, 2012; March 24, 2014

### 3120.1 PREMISE

The legislature of the State of California has declared that the deposit and investment of public funds by local officials and local agencies is an issue of statewide concern (California Government Code (CGC) 53600.6 and 53630.1)

CGC Sections 5921 and 53601, et seq., allow the legislative body of a local agency to invest surplus monies not required for the immediate necessities of the local agency; and,

The fiscal officer of a local agency is required to annually prepare and submit a statement of investment policy and such policy, and any changes thereto, is to be considered by the local agency's legislative body at a public meeting (CGC 53646(a))

For these reasons, and to ensure prudent and responsible management of the public's funds, it is the policy of the Novato Sanitary District (District) to invest funds in a manner which will provide the highest investment return with the maximum security while meeting the daily cash flow demands of the District and conforming to all statutes governing the investment of District funds.

### 3120.2 SCOPE

This investment policy applies to all financial assets of Novato Sanitary District, including Operating Funds, Capital Improvement Funds and Bond Funds.

**3120.2.1 Regular Warrants Account:** As cash is received, it is deposited in the District's Money Market Checking Account with Westamerica Bank. Cash on hand is reviewed daily and all inactive or reserve funds above the minimum balance are wire transferred periodically to the State Local Agency Investment Fund (LAIF), or invested locally in certificates of deposit. When the District writes checks, for whatever purpose, funds are withdrawn from LAIF to cover the checks written.

**3120.2.2 Payroll Account:** The District's payroll is prepared in-house. All pay checks and pay vouchers (for direct deposit) are processed through the District's Payroll Account with Westamerica Bank. After the checks and vouchers are reconciled, funds to cover payroll are transferred from the Operating Account to the Payroll Account.

**3120.2.3 Petty Cash Account:** The District maintains a Petty Cash account with a balance not to exceed \$1,000.00. This account is for small purchases.

3120  
Adopted 12/10/12  
Revised 03/24/14

**3120.2.4 Capital Projects Account:** This account is used to track capital project expenditures throughout the year. Any excess balance above the minimum balance is wire transferred to LAIF. When the District writes checks for project expenses funds are withdrawn from LAIF to cover the checks written. Funds are transferred from the regular warrants account after this account has been funded by LAIF, for operating and project expenses.

**3120.2.5 ARRA Grant Project Account:** This account is established to receive grant funds under the American Reinvestment and Recovery Act for partial financing of the District's Recycled Water Project. The project is part of the regional recycled water project administered by the North Bay Water Reuse Authority.

**3120.2.6 Local Agency Investment Account:** Operating, Cash flow, and Capital reserves are invested in the Local Agency Investment Fund (LAIF) that is regulated by California Government Code Section 16429 under the oversight of the Treasurer of the State of California. The balance is available for withdrawal on demand.

**3120.2.7 Certificates of Participation (COP) Bond Fund:** The District must maintain the unspent proceeds of the COP with trustees or fiscal agents under the terms of the debt issue. The COP proceeds are administered by the Bank of New York Mellon and are invested with LAIF.

**3120.2.8 Excluded investments:** Funds not included in the policy include deferred compensation funds since the assets of the plan are held for the exclusive benefit of plan participants and their beneficiaries and the individual plan participants are responsible for the investment of these accounts.

### **3120.3 PRUDENCE**

Investments shall be made with judgment and care, under circumstances then prevailing, which persons of prudence, discretion and intelligence exercise in the management of their own affairs; not for speculation, but for investment, considering the probable safety of their capital as well as the probable income to be derived. The standard of prudence to be used by investment officials shall be the "prudent investor" standard as stated in CGC Section 53600.3 and shall be applied in the context of managing an overall portfolio. Investment officers acting in accordance with written procedures and the investment policy and exercising due diligence shall be relieved of personal responsibility for an individual security's credit risk or market price changes, provided deviations from expectations are reported in a timely fashion and appropriate action is taken to control adverse developments.

### **3120.4 OBJECTIVES**

As specified in CGC Section 53600.5, when investing, reinvesting, purchasing, acquiring, exchanging, selling and managing public funds, the primary objectives, in priority order, of the investment activities shall be:

**3120.4.1 Safety:** Safety of principal is the foremost objective of the investment program. Investments of the District shall be undertaken in a manner that seeks to ensure the preservation of capital in the overall portfolio. To attain this objective, diversification is required in order that potential losses on individual securities do not exceed the income generated from the remainder of the portfolio.

**3120.4.2 Liquidity:** The investment portfolio will remain sufficiently liquid to enable the District to meet all operating requirements which might be reasonably anticipated.

**3120.4.3 Return on Investments:** The investment portfolio shall be designed with the objective of attaining a market rate of return throughout budgetary and economic cycles, taking into account the

investment risk constraints and the cash flow characteristics of the portfolio.

### **3120.5 DELEGATION OF AUTHORITY**

Authority to manage the investment program is derived from CGC Sections 53600, et seq. Management responsibility for the investment program is hereby delegated to the Treasurer, Sandeep S. Karkal, who shall establish written procedures for the operation of the investment program consistent with this investment policy. Such procedures shall include explicit delegation of authority to persons responsible for investment transactions. The following employees are authorized to telephone instructions for deposits and withdrawals from the District bank account to the State Treasurer and vice versa:

Sandeep S. Karkal, Manager-Engineer, Treasurer  
Laura M. Creamer, Finance Officer

No person may engage in an investment transaction except as provided under the terms of this policy and the procedures established by the Treasurer. The Treasurer shall be responsible for all transactions undertaken and shall establish a system of controls to regulate the activities of subordinate officials. Under the provisions of CGC 53600.3, the Treasurer is a trustee and a fiduciary subject to the prudent investor standard. The District maintains a public officials' surety bond in the amount of \$200,000.

### **3120.6 ETHICS AND CONFLICTS OF INTEREST**

Officers and employees involved in the investment process shall refrain from personal business activity that could conflict with the proper execution of the investment program, or which could impair their ability to make impartial investment decisions.

### **3120.7 AUTHORIZED FINANCIAL INSTITUTIONS AND DEALERS**

The Treasurer will maintain a list of financial institutions, selected on the basis of credit worthiness, financial strength, experience and minimal capitalization authorized to provide investment services. In addition, a list will also be maintained of approved security broker/dealers selected by credit worthiness who are authorized to provide investment and financial advisory services in the State of California. No public deposit shall be made except in a qualified public depository as established by state laws.

For brokers/dealers of government securities and other investments, the Treasurer shall select only broker/dealers who are licensed and in good standing with the California Department of Securities, the Securities and Exchange Commission, the National Association of Securities Dealers or other applicable self-regulatory organizations.

Before engaging in investment transactions with a broker/dealer, the Treasurer shall have received from said firm a signed Certification Form. This form shall attest that the individual responsible for the District's account with that firm has reviewed the District's Investment Policy and that the firm understands the policy and intends to present investment recommendations and transactions to the District that are appropriate under the terms and conditions of the Investment Policy.

### **3120.8 AUTHORIZED AND SUITABLE**

It is the practice of the District to invest inactive operating and capital improvement funds only with the State Treasurer's Local Agency Investment Fund and/or with local banks and savings and loans. *Prohibited Investments.* Under the provisions of CGC Section 53601.6 and 53631.5, the District shall not invest any funds covered by this Investment Policy in inverse floaters, range notes, interest-only strips derived from mortgage pools or any investment that may result in a zero interest accrual if held to

maturity.

### **3120.9 COLLATERALIZATION**

All certificates of deposit must be collateralized by U.S. Treasury Obligations. Collateral must be held by a third party trustee and valued on a monthly basis. The percentage of collateralization on repurchase and reverse repurchase agreements will adhere to the amount required under CGC Section 53601(i)(2).

### **3120.10 SAFEKEEPING AND CUSTODY**

All security transactions entered into by the District shall be conducted on delivery-versus-payment (DVP) basis. All securities purchased or acquired shall be delivered to the District by book entry, physical delivery or by third party custodial agreement as required by CGC Section 53601.

### **3120.11 DIVERSIFICATION**

The District will diversify its investments by security type and institution. It is the policy of the District to remit money not required for immediate needs to LAIF for purposes of investment. Assets in the pooled money account are diversified to eliminate the risk of loss resulting from over concentration of assets in a specific maturity, a specific issuer or a specific class of securities.

### **3120.12 REPORTING**

In accordance with CGC Section 53646(b)(1), Treasurer shall submit to each member of the Board of Directors a quarterly investment report. The report shall include a complete description of the portfolio, the type of investments, the issuers, maturity dates, par values and the current market values of each component of the portfolio, including funds managed for the District by third party contracted managers. The report will also include the source of the portfolio valuation. As specified in CGC Section 53646(e), if all funds are placed in LAIF, FDIC-insured accounts and/or in a county investment pool, the foregoing report elements may be replaced by copies of the latest statements from such institutions.

The report must also include a certification that (1) all investment actions executed since the last report have been made in full compliance with the Investment Policy and, (2) the District will meet its expenditure obligations for the next six months as required by CGC Section 53646(b)(2) and (3) respectively. The Treasurer shall maintain a complete and timely record of all investment transactions.

### **3120.13 INVESTMENT POLICY REVIEW**

The Policy shall be reviewed on an annual basis, and modifications must be approved by the Board of Directors.

# NOVATO SANITARY DISTRICT BOARD AGENDA ITEM SUMMARY

<b>TITLE: Consent Calendar: Collection System Maintenance, 2017 Root Control Treatment - Account No. 60153 (Outside Services)</b>	<b>MEETING DATE: May 8, 2017</b>  <b>AGENDA ITEM NO.: 5.f.</b>
<b>RECOMMENDED ACTION: Approve a contract in the not-to-exceed amount of \$75,000 with Duke's Root Control, Inc., (Duke's), and authorize the General Manager-Chief Engineer to execute it.</b>	
<b>SUMMARY AND DISCUSSION:</b>  <p>An important part of the District's annual collection system maintenance activities is to control and abate tree roots that intrude into its sewers. If left unchecked, these roots can grow within the sewers to where they can impede or completely block flow in the sewers, either by themselves or in combination with grease, rags, and debris build-up, and potentially result in sanitary sewer overflows (SSOs).</p> <p>Based on maintenance history records, staff has identified approximately 50,000 feet of sewer mains ranging in size from 6 inch to 15 inch, and 15 manholes that will benefit from root abatement this year. Duke's can provide root abatement services using a chemical root control foaming agent to control this problem. Staff has verified that the use of this chemical will not affect the District's ability to meet its discharge permit requirements. Duke's has performed this work for the District in previous years.</p> <p>Staff has negotiated a scope of services with Duke's on a time-and-materials basis in the not-to-exceed amount of \$75,000 to accomplish this work. The unit costs negotiated are identical to the costs negotiated last year, (i.e. \$1.09/ft. for 6" and 8" pipe, \$1.76/ft. for 10", \$1.92/ft. for 12", \$2.73 for 15" pipe and \$125.00 per manhole). Staff therefore recommends that the Board approve a contract with Duke's in the not-to-exceed amount of \$75,000, and authorize the General Manager-Chief Engineer to execute it.</p>	
<b>STRATEGIC PLAN INFORMATION:</b> This item addresses Goal 1 (Operational Excellence), and Goal 2 (Reliable and Efficient Facilities), of the latest Strategic Plan Update.	
<b>BUDGET INFORMATION:</b> This work will be funded from Account No. 60153 - Outside Services. The FY16-17 budget amount for this account is \$175,000. As of April 6, 2017, the budget balance for this account is \$94,129, and there are no other known commitments or related expenditures for Account No. 60153 at this time.	
<b>DEPT. MGR.:</b> DD, SRK	<b>GENERAL MANAGER:</b> SSK

# NOVATO SANITARY DISTRICT BOARD AGENDA ITEM SUMMARY

**TITLE:** Wastewater Operations Report, April 2017.

**MEETING DATE:** May 8, 2017

**AGENDA ITEM NO.:** 6.a.

**RECOMMENDED ACTION:** Receive Wastewater Operations Report for April 2017.

**SUMMARY AND DISCUSSION:**

The April 2017 Wastewater Operations Report incorporating operations reports for wastewater treatment operations, collection system operations, and the reclamation facilities is attached.

District and Veolia staff will be present at the meeting to provide overviews of the reports for their operational areas, and be available to discuss the reports or respond to any questions.

**ATTACHMENTS:** 1. Wastewater Operations Report for the month of April 2017.

**STRATEGIC PLAN INFORMATION:** This item addresses Goal 1 (Operational Excellence) and Goal 2 (Reliable and Efficient Facilities) of the latest Strategic Plan Update.

**DEPT. MGR.:** JB (Veolia), SRK, DD, EB

**GENERAL MANAGER:** SSK



May 3, 2017

Mr. Sandeep Karkal  
General Manager – Chief Engineer  
Novato Sanitary District  
500 Davidson Street  
Novato, CA 94545

**Subject: Veolia Water Operations Report – April 2017**

Dear Mr. Karkal:

I am pleased to provide the Monthly Operation report for April 2017.

As always, please give me a call at 707-208-4491 should you have any questions.

Best regards,

A handwritten signature in blue ink, appearing to read "John Bailey".

John Bailey  
Project Manager, Veolia



MONTHLY OPERATIONS REPORT  
April 2017

Prepared for

NOVATO SANITARY DISTRICT (NSD)  
WASTEWATER TREATMENT PLANT  
500 Davidson Street  
Novato, CA 94945

Prepared by

Veolia Water West Operating Services, Inc. (VWWOS)

**TABLE OF CONTENTS**

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- A: TREATMENT PLANT PERFORMANCE SUMMARY
- B: SAFETY AND TRAINING
- C: OPERATIONS AND MAINTENANCE STATUS / REVIEW
- D: LABORATORY ACTIVITIES SUMMARY
- E: ADMINISTRATION
- F: ODORS & LANDSCAPING
- G: MISCELLANEOUS

ATTACHMENTS

- 1) Photos
  - 2) Laboratory Data
  - 3) Recycled Water Report
  - 4) Annual Performance Graphs
  - 5) Process Control Data / Graphs
  - 6) Customer Notifications (Odor / Noise)
  - 7) Jerome Meter Readings and Locations
  - 8) Effluent / Outfall (tributary) Leak
  - 9) Laboratory Proficiency Testing – Certificate of Excellence
-

**A: TREATMENT PLANT PERFORMANCE SUMMARY: April 2017:**

Parameter	Value		Limit	
	Ave	Max	#1	#2
Flow, MGD (monthly ave/max)	5.97	11.53	N/A	N/A
Max Peak Hour, MGD – 3/24/17 : 1320 - 1420 Hours	N/A	~14.5	N/A	N/A
Rainfall Inches (monthly total / peak day – 3/20/17)	2.95	1.37	N/A	N/A
<b>Influent</b>				
BOD <sub>5</sub> , lb/day (month ave/max)	10,935	15,552	N/A	N/A
TSS, lb/day (monthly ave/max)	9,537	13,608	N/A	N/A
<b>Effluent</b>				
BOD <sub>5</sub> , mg/L (monthly ave/max weekly ave)	<5	6	30	45
TSS, mg/L (monthly ave/max weekly ave)	<4	4	30	45
BOD <sub>5</sub> - % Removal, Minimum	98	N/A	85	N/A
TSS - % Removal, Minimum	98	N/A	85	N/A
Ammonia, mg/L – (monthly ave/daily max)	0.71	0.71	5.9	21
pH, su (min / max)	6.8	7.0	6.0	9.0
Enterococcus, MPN/100 ml (30 day geo mean)	4.5	N/A	35	N/A
Fecal Coliform, MPN/100 ml (30 day median)	N/A	N/A	140	N/A
Fecal Coliform, MPN/100 ml (90 <sup>th</sup> percentile)	N/A	N/A	430	N/A
<b>Total Permit Exceedances (NPDES)</b>	0			

**Title 22 - Recycled Water Production and Quality**

Description	Units	Value	Limit
Volume Produced	Million Gallons	0.749	N/A
Average Turbidity	NTU	1.1	2.0
Turbidity > 5 NTU (in 24 hour)	Minutes	0	72
Minimum CT (disinfection)	mg-min/L	>450	450 minimum
Minimum Dissolved Oxygen (DO)	mg/L	8.56	2 mg/L minimum
Maximum Total Coliform	MPN/100 ml	<1.8	240
Maximum Total Coliform 2 Samples 30 d	MPN/100 ml	<1.8	23
Total Coliform 7 Sample Median	MPN/100 ml	<1.8	2.2

**Discussion of Violations / Excursions**

- Bay Discharge (NPDES) – None
- Recycled Water – No Production / Demand

**Other**

- Leak on Effluent / Outfall Line – See Attachment 8



**B: SAFETY AND TRAINING:**

- Monthly plant safety inspections for Novato WWTP and Ignacio Transfer Pump Station completed
- Five Minute Tailgate training is held daily with all staff.
- No safety incidents for the month of March
- Accident Free: 6/1/10 – 4/30/17: 2,532 days
- Monthly Safety Topics and Training:
  - Confined Space Training

**C: OPERATIONS & MAINTENANCE STATUS / REVIEW:****Key events for the period:****Novato**

- Routine rounds, readings and maintenance
- Semi-Annual HVAC Service
- Annual diesel fuel tank sampling on all diesel fuel tanks/day tanks
- Filtered and polished diesel fuel in main diesel fuel tank
- Annual Jerome Meter calibration/service
- Replaced flare solenoid valve for pilot light

**Equipment Out of Service – Due to Planned Servicing, Maintenance, or Replacement**

- Aeration Basin #1 & #3 (standby)
- Primary Clarifier #1 (standby)

**Ignacio Transfer Pump Station**

- Routine rounds, readings and maintenance
- Annual diesel fuel tank sampling
- Filtered and polished diesel fuel in main diesel fuel tank
- Installed new eyewash at newly installed sodium hypochlorite tank

**Equipment Out of Service – Due to Planned Servicing, Maintenance, or Replacement**

- None

**Recycled Water Plant (RWP)**

- Startup of RWP

**Equipment Out of Service – Due to Planned Servicing, Maintenance, or Replacement**

- None

**Sludge Lagoons (and Reclamation Area)**

- Performed routine rounds and inspection



**D: LABORATORY ACTIVITIES SUMMARY:****Discharge to Bay****Wildlife Pond**

Samples and weekly/monthly observations at the Wildlife pond were taken according to the WDR (Order No. 92-065).

**Total Coliforms**

When effluent is discharged to the Bay, there is no requirement for Total Coliform.

**Enterococcus**

When effluent is discharged to the Bay, the bacteriological requirement is for *Enterococcus*. Three samples were analyzed each week in April and all were well under the regulatory limits.

**Fecal Coliforms**

Fecal Coliform sampling is required once per quarter during Bay discharge. The quarterly sample was analyzed in March for the March through May Quarter, with the results well below the regulatory limit.

**Whole Effluent Toxicity Testing**

Quarterly Acute and Chronic Toxicity is required during Bay Discharge. Testing began on April 5, 2017. Both analyses were performed by Aqua Science in Davis, CA. Acute Toxicity testing results yielded 100% survival. The Chronic Toxicity test results for survival and growth were very good at <1.0 TUc each.

**PCBs (40 Congeners)**

Samples were sampled and sent to Frontier Analytical April 6, 2017. There were no results above the method (reporting) limit, but there is no effluent limit for PCBs. These PCB Congeners are analyzed quarterly during bay discharge.

**Proficiency Testing**

Proficiency testing was conducted in April and we achieved 100% acceptable data in the study (Certificate of Excellence, see Attachment 9). This was a collaboration between Kurt Hawkyard, Liz Falejczyk and Jessica Bena from North Marin Water district. Enterococcus and Dissolved Oxygen proficiency testing will be performed in May as it was not available in this April study.

**E: ADMINISTRATION:**

- March Electronic Self-Monitoring Report (SMR) submitted on April 29, 2017
- March Electronic Discharge Monitoring Report (DMR) submitted on April 29, 2017

**F: ODORS & LANDSCAPING:**

- No contacts from neighbors during the month.
- Jerome meter (H<sub>2</sub>S) readings performed in neighborhood and within treatment plant.
- All readings in neighborhood were at the minimum detection threshold of the Jerome meter.
- Sodium Hypochlorite tank for Ignacio Transfer Pump Station was commissioned and is in service.

**G: MISCELLANEOUS**

- Process Control Management Plan (PCMP) meetings held weekly.

**Veolia Support Staff On/Off Site (Various Times)**

John O'Hare (Veolia Corporate)

Technical Support, Pretreatment & Laboratory

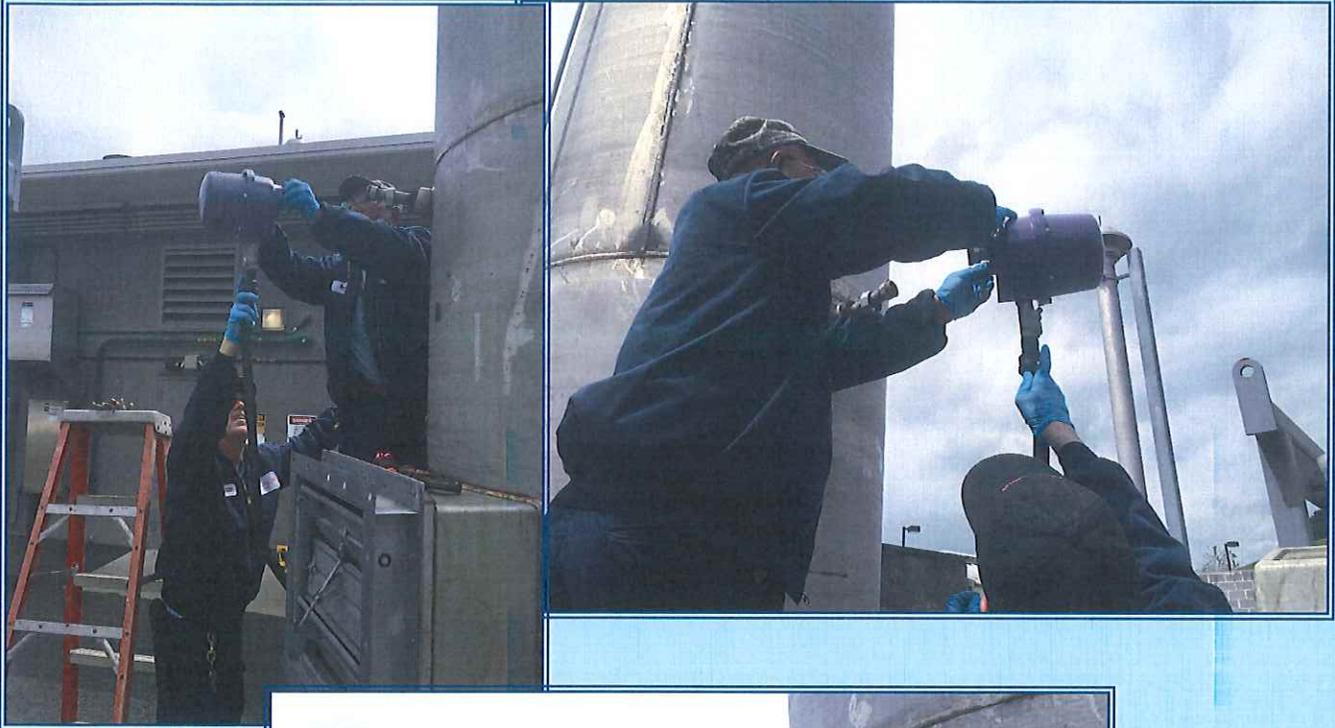
Dennis Flosi, Veolia Richmond

Instrumentation and Controls Specialist, Troubleshoot Flare Issue



# ***1) PHOTOS***

BIOGAS FLARE MAINTENANCE  
APRIL 2017



Top – Preston Ingram and Alejo Cuntapay remove Flame Sensor for cleaning  
Bottom - Brian Exberger & Alejo cleaning Flame Sensor

NSD / NMWD EPA VIDEO CASE STUDY – DROUGHT RESPONSE  
APRIL 2017



Top Left – Production Crew sets up for interview with Sandeep Karkal  
Top Right – Exposed Recycled Water Filter in operation  
Bottom Left – Alejo & Brian install safety railing around open filter bay  
Bottom Right – Manny Arias cleaning filter basin

## ***2) LABORATORY DATA***

Novato Sanitary District  
BOD/TSS Report



April, 2017

Date	Flow MGD	Influent				Effluent				BOD % Removal	TSS % Removal
		BOD		TSS		BOD		TSS			
		mg/l	lb/d	mg/l	lb/d	mg/l	lb/d	mg/l	lb/d	PERCENT	PERCENT
04/01/17	5.84										
04/02/17	5.30										
04/03/17	5.37										
04/04/17	4.61										
04/05/17	4.73	200	7,890	180	7,101	<5	<197	4	158	97.5	97.8
04/06/17	8.71					<5	<363	4	291		
04/07/17	11.53										
04/08/17	10.76										
04/09/17	8.17										
04/10/17	6.90										
04/11/17	6.66	280	15,552	245	13,608	<5	<278	<3	<167	98.2	98.8
04/12/17	6.07										
04/13/17	6.17										
04/14/17	5.81										
04/15/17	5.71										
04/16/17	5.96										
04/17/17	6.09	240	12,190	226	11,479	6	305	4	203	97.5	98.2
04/18/17	5.60										
04/19/17	5.73										
04/20/17	5.57										
04/21/17	5.25										
04/22/17	4.95										
04/23/17	5.00										
04/24/17	4.79										
04/25/17	4.86	200	8,106	147	5,958	6	243	4	162	97.0	97.3
04/26/17	4.57										
04/27/17	4.65										
04/28/17	4.54										
04/29/17	4.47										
04/30/17	4.75										
<b>Weekly Averages</b>											
04/01/17	Week 1	180	10,088	177	9,920	5	280	3	168		
04/08/17	Week 2	200	7,890	180	7,101	5	280	4	224		
04/15/17	Week 3	280	15,552	245	13,608	5	278	3	167		
04/22/17	Week 4	240	12,190	226	11,479	6	305	4	203		
04/29/17	Week 5	200	8,106	147	5,958	6	243	4	162		
<b>Monthly</b>											
Minimum	4.47	200	7,890	147	5,958	<5	<197	<3	158	97	97
Maximum	11.53	280	15,552	245	13,608	6	<363	4	291	98	99
Total	179.12										
Average	5.97	230	10,935	200	9,537	<5	<277	<4	<196	98	98

Novato Sanitary District  
Conventional Pollutants Report



April, 2017

Date	INFLUENT - A001			Effluent - E002							
	Flow Total	pH	Ammonia	Coliform / Bacteria			pH	Ammonia	Oil & Grease	Temp	Rainfall
				Fecal	Entero	Total					
	MGD	su	mg/L	MPN/100 mL			su	mg/L	mg/L	Deg C	Inches
04/01/17	5.84										0.00
04/02/17	5.30										0.00
04/03/17	5.37						6.9			18.9	0.00
04/04/17	4.61					3.0	6.9			18.8	0.00
04/05/17	4.73					2.0	6.8			19.1	0.00
04/06/17	8.71					7.3	7.0	0.71	<1.4	18.5	1.37
04/07/17	11.53						6.8			17.8	0.77
04/08/17	10.76										0.19
04/09/17	8.17										0.00
04/10/17	6.90						6.9			18.5	0.00
04/11/17	6.66					1.0	7.0			18.2	0.00
04/12/17	6.07	7.4					7.0			18.7	0.10
04/13/17	6.17					2.0	7.0			18.6	0.07
04/14/17	5.81					23.8	7.0			18.3	0.00
04/15/17	5.71										0.00
04/16/17	5.96										0.15
04/17/17	6.09					4.1	6.9			19.0	0.16
04/18/17	5.60						6.8			19.0	0.02
04/19/17	5.73					6.3	6.9			19.4	0.10
04/20/17	5.57					8.4	7.0			19.5	0.01
04/21/17	5.25	7.4					6.9			19.9	0.00
04/22/17	4.95										0.00
04/23/17	5.00										0.00
04/24/17	4.79						7.0			19.7	0.00
04/25/17	4.86					4.1	7.0			19.3	0.00
04/26/17	4.57					7.5	6.9			19.8	0.01
04/27/17	4.65					5.2	6.9			19.5	0.00
04/28/17	4.54	7.5					6.9			19.8	0.00
04/29/17	4.47										0.00
04/30/17	4.75										0.00
<b>Monthly</b>											
Minimum	4.47	7.4				1.0	6.8	0.71		17.8	0.00
Maximum	11.53	7.5				23.8	7.0	0.71	<1.4	19.9	1.37
Total	179.12										2.95
Average	5.97	7.4					6.9	0.71	<1.4	19.0	0.10
Geo Mean						4.5					

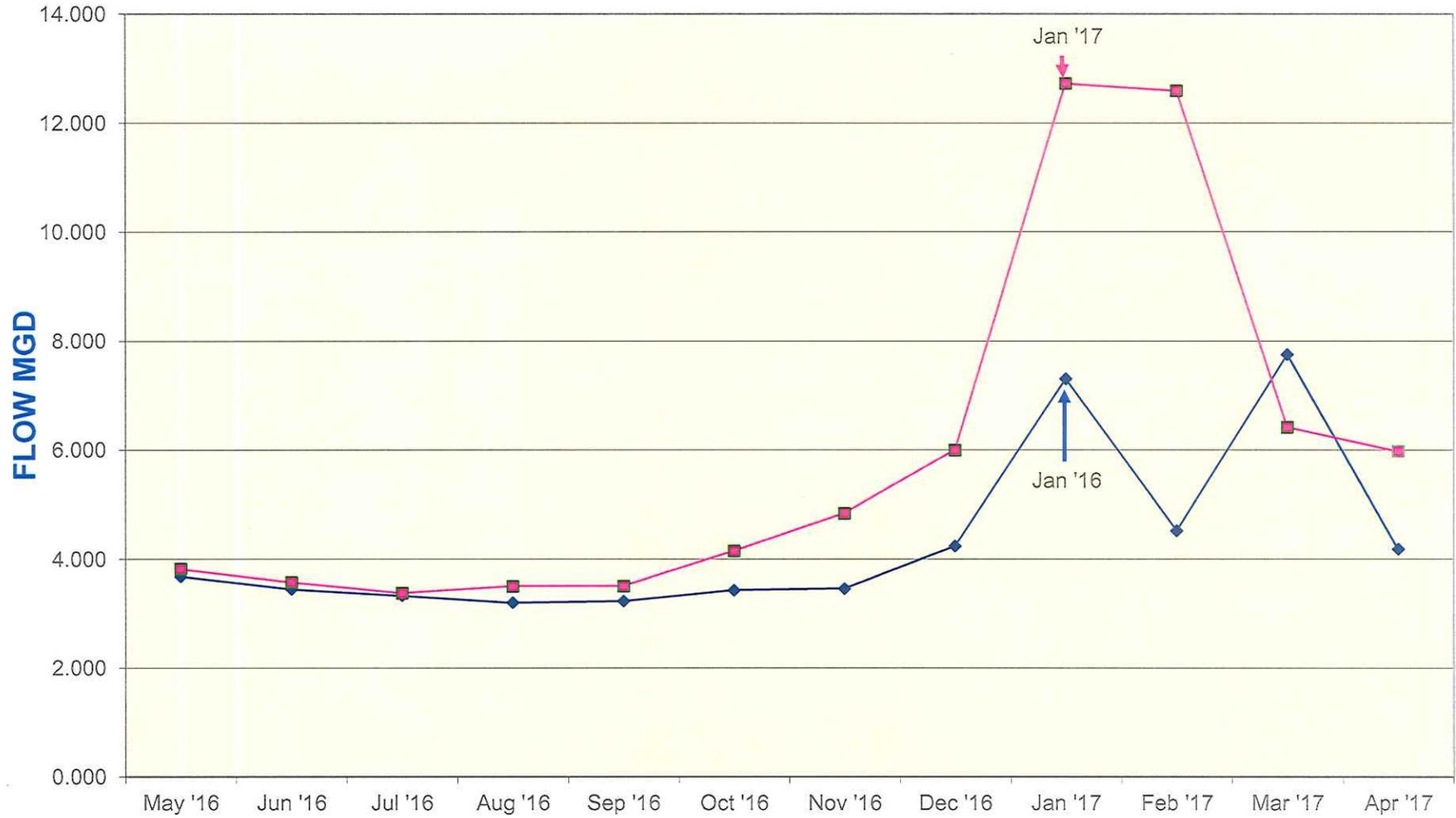
### **3) *RECYCLED WATER REPORT***

# NOVATO SANITARY DISTRICT RECYCLED WATER COMPLIANCE SUMMARY REPORT

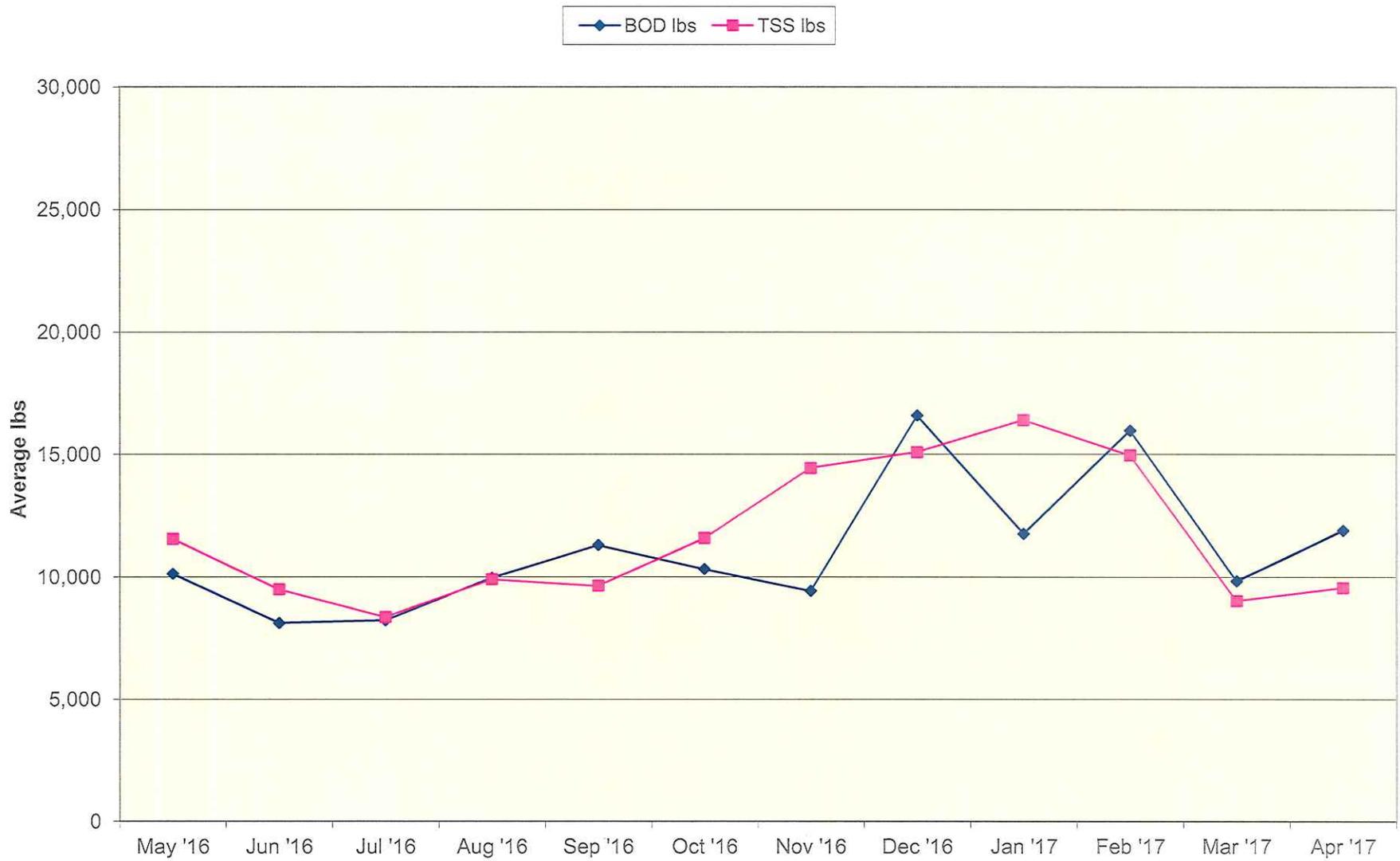
Date	Filter Influent Flow	Recycled Water Flow to Plum St.	Recycled Water Banked	Banked Water To Plum Street Tank	Potable Water To Plum St Tank	Recycled Water Influent Turbidity Max	Recycled Water Influent Turbidity Ave.	Minutes Over 5 Turbidity	Filter Effluent 24 Hr Average Turbidity	Recycled Water Inf Chlorine Dose	Filter Effluent Dissolved Oxygen	Filter Effluent Total Coliform	Chlorint Contact Time
	MGD	MGD	MG	MGD	NTU	NTU	(m)	NTU	(mg/l)	(mg/l)	MPN/100m	Minutes	
4/1/2017	0.750												
4/2/2017	0.670	0.265						0	1.2				
4/3/2017	0.160							0	1.2				
4/4/2017	0.000												
4/5/2017													
4/6/2017													
4/7/2017													
4/8/2017													
4/9/2017													
4/10/2017													
4/11/2017													
4/12/2017													
4/13/2017													
4/14/2017													
4/15/2017													
4/16/2017													
4/17/2017													
4/18/2017													
4/19/2017													
4/20/2017	0.820												
4/21/2017	0.170	0.120						0	1.1				
4/22/2017													
4/23/2017													
4/24/2017													
4/25/2017	0.740												
4/26/2017	0.850												
4/27/2017													
4/28/2017													
4/29/2017													
4/30/2017	0.900	0.364						0	1.0				
<b>Total</b>	<b>5.060</b>	<b>0.749</b>											
<b>Minimum</b>	<b>0.000</b>	<b>0.120</b>						<b>0</b>	<b>1.0</b>				
<b>Maximum</b>	<b>0.900</b>	<b>0.364</b>						<b>0</b>	<b>1.2</b>				
<b>Average</b>	<b>0.562</b>	<b>0.250</b>						<b>0</b>	<b>1.1</b>				

## **4) ANNUAL COMPLIANCE SUMMARY – GRAPHS**

## WASTEWATER INFLUENT FLOW COMPARISON



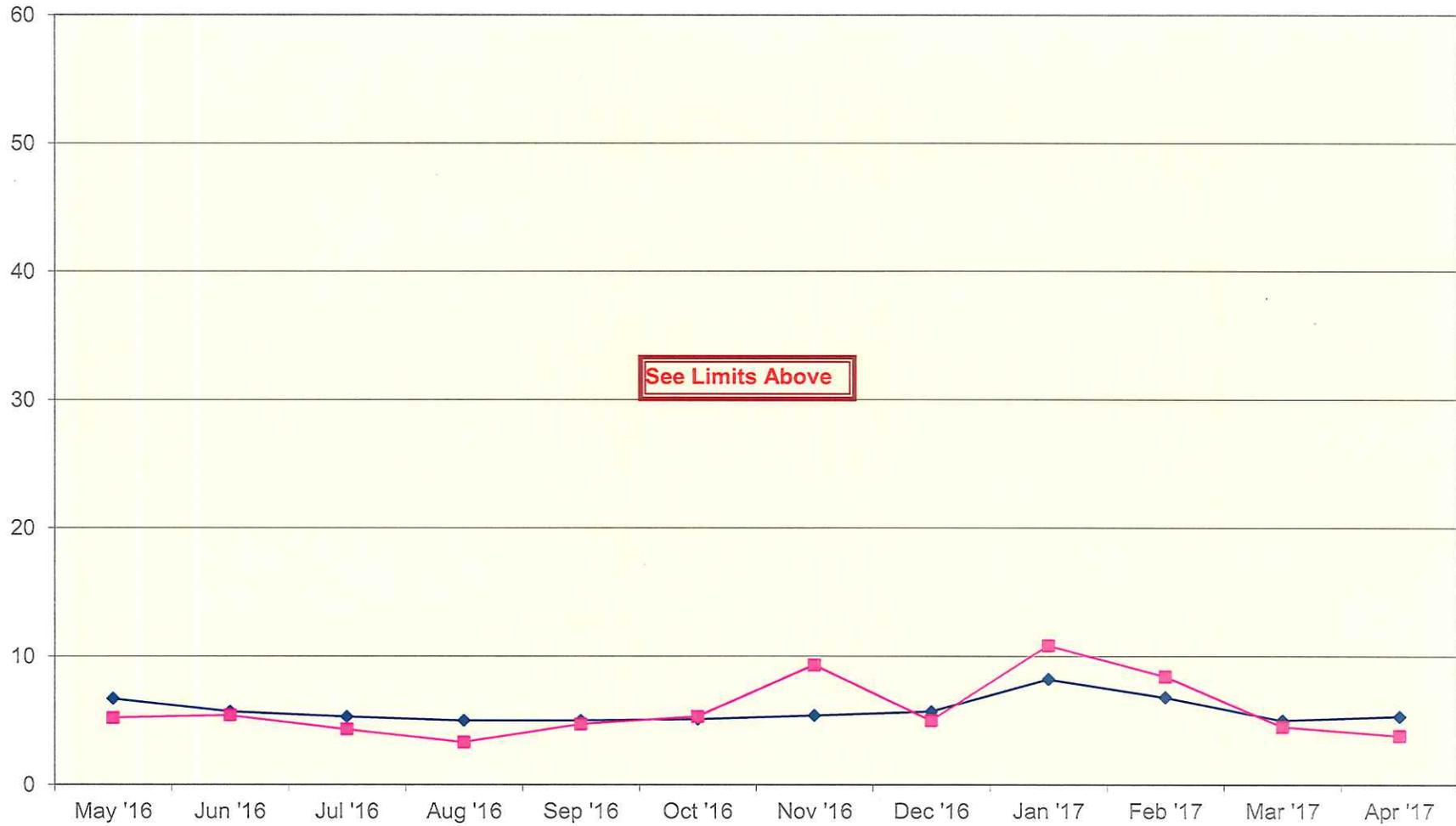
### Influent Load BOD / TSS lbs



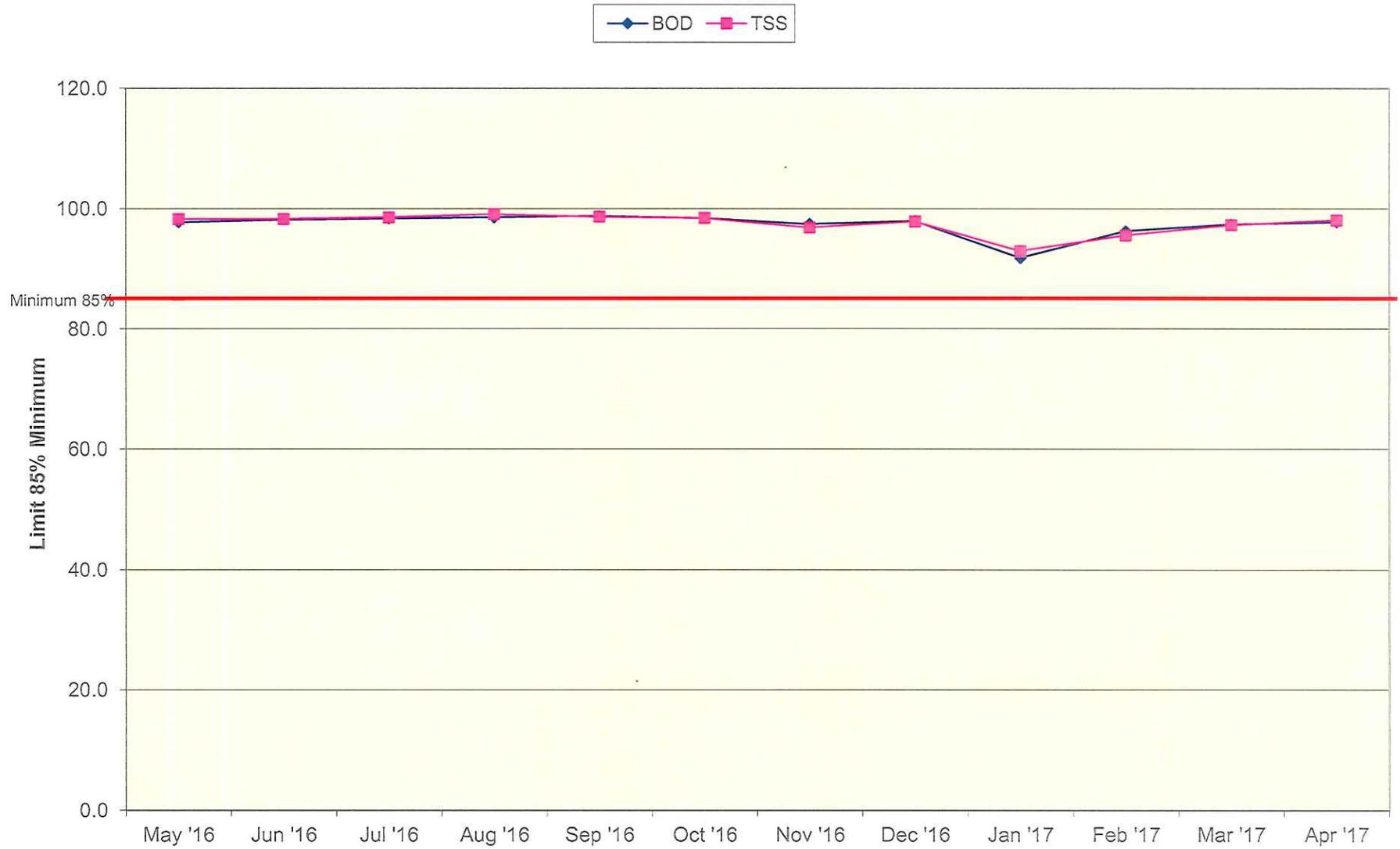
## Effluent BOD / TSS Concentration

**NPDES LIMITS WET SEASON**  
**BOD & TSS - 30 mg/L Monthly Ave, 45 mg/L Weekly Ave**  
 NPDES LIMITS DRY SEASON  
 BOD - 15 mg/L Monthly Ave, 30 mg/L Weekly Ave  
 TSS - 10 mg/L Monthly Ave, 20 mg/L Weekly Ave  
 WDR (Waste Discharge Requirements) RECLAMATION  
 BOD - 40 mg/L

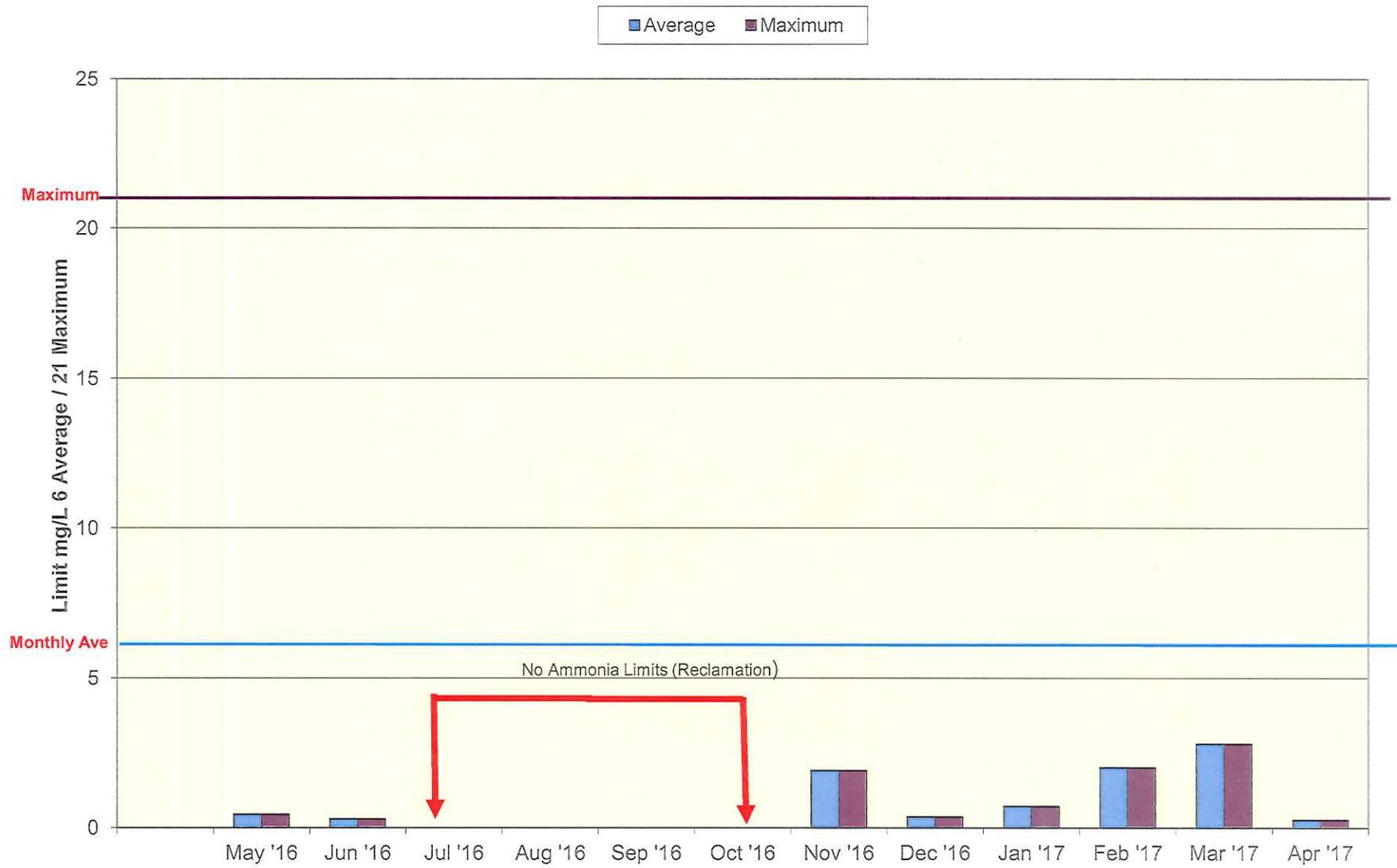
◆ BOD    ■ TSS



### BOD / TSS Percent Removal

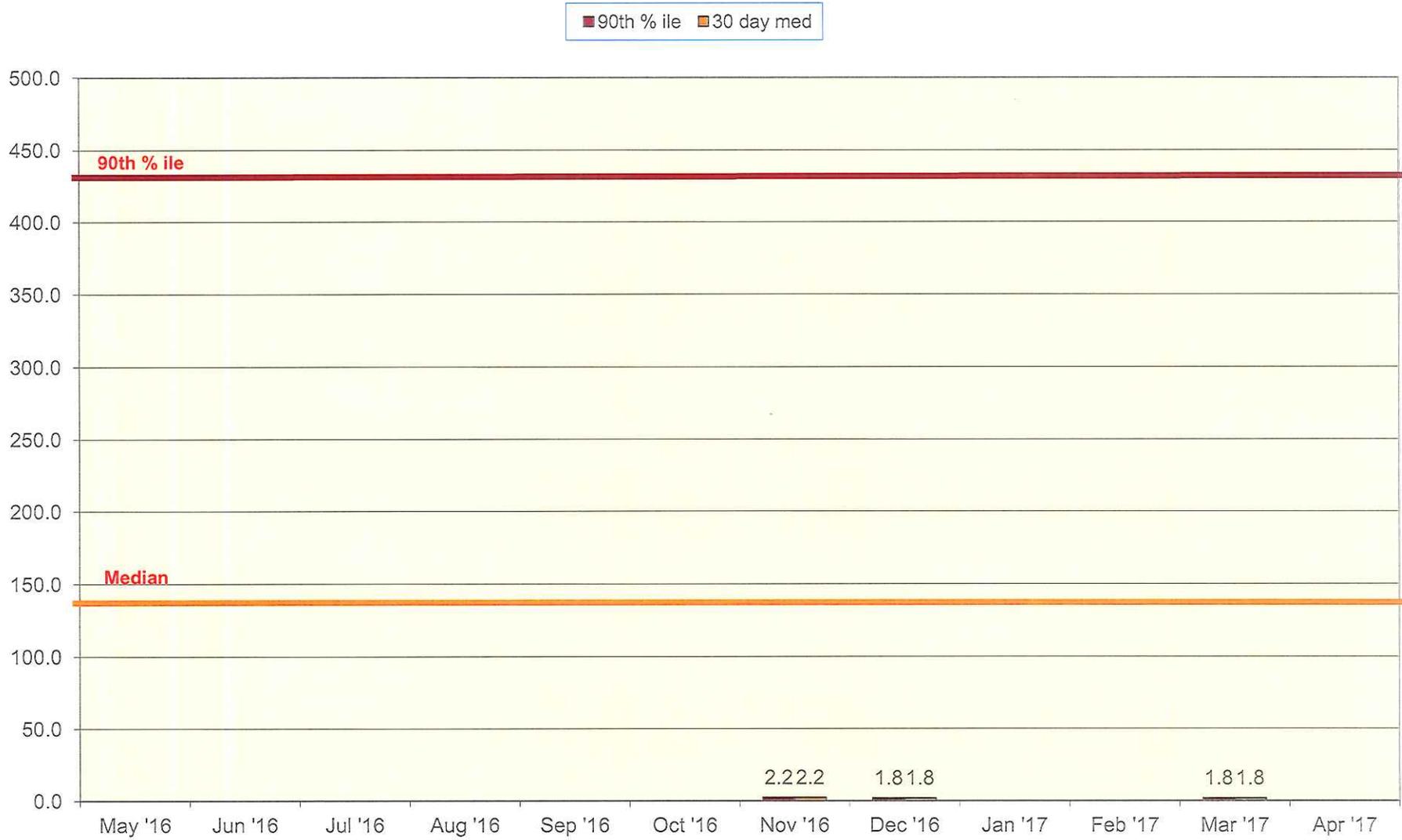


# Effluent Ammonia



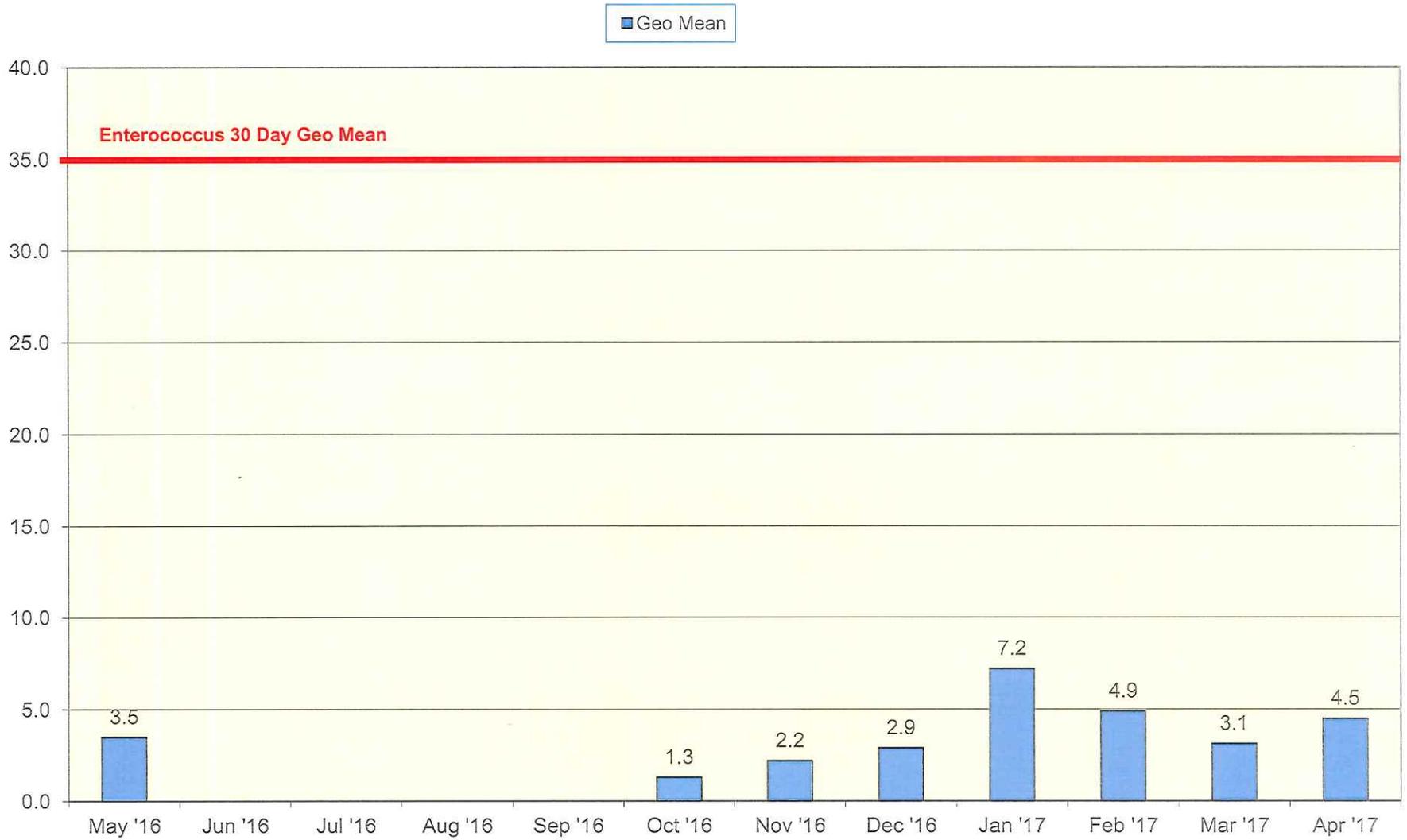
# Disinfection - Fecal Coliform

LIMITS - NPDES  
Fecal 140 mpn monthly median  
Fecal 430 mpn 90th percentile 30 day

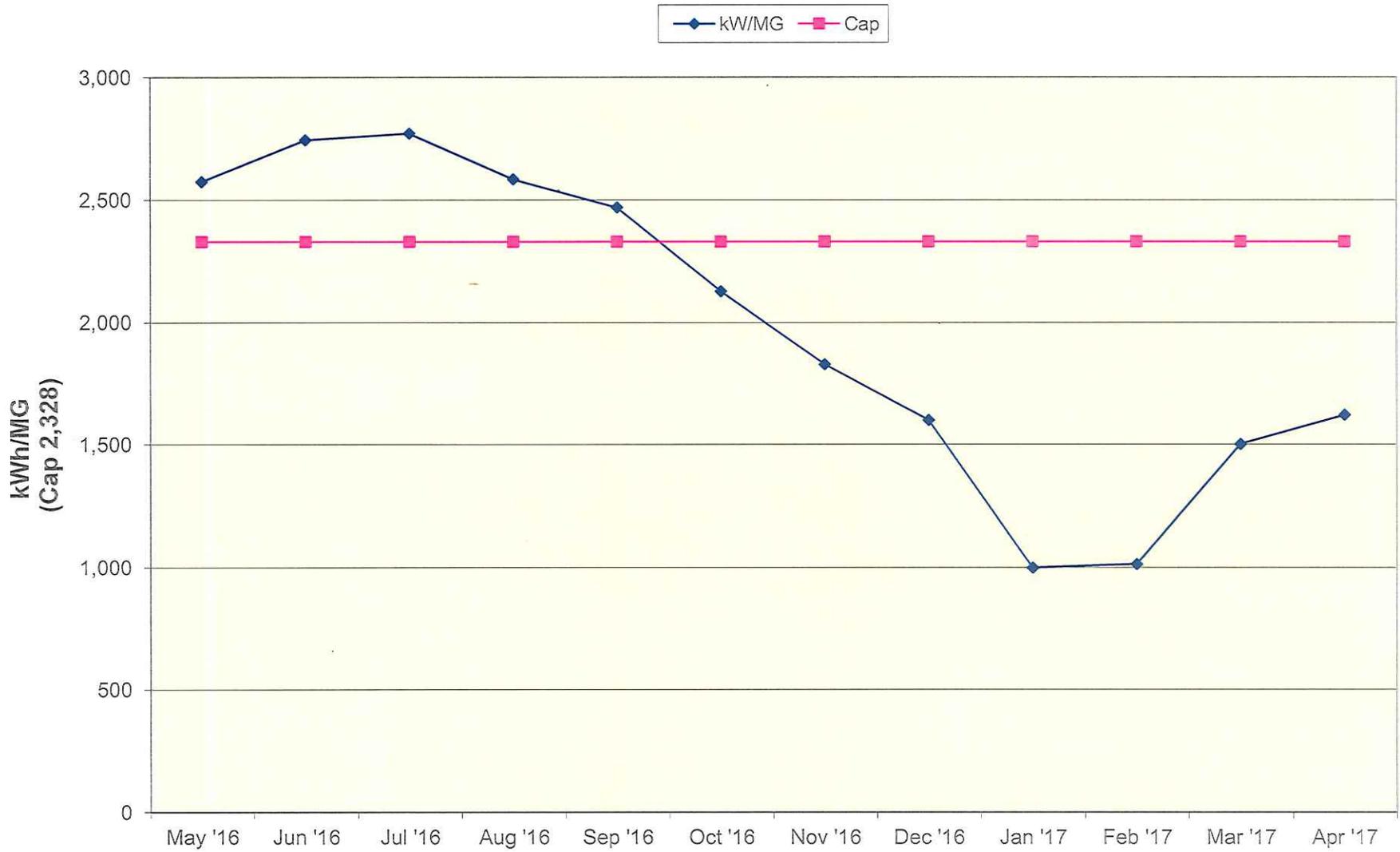


# Disinfection - Enterococcus

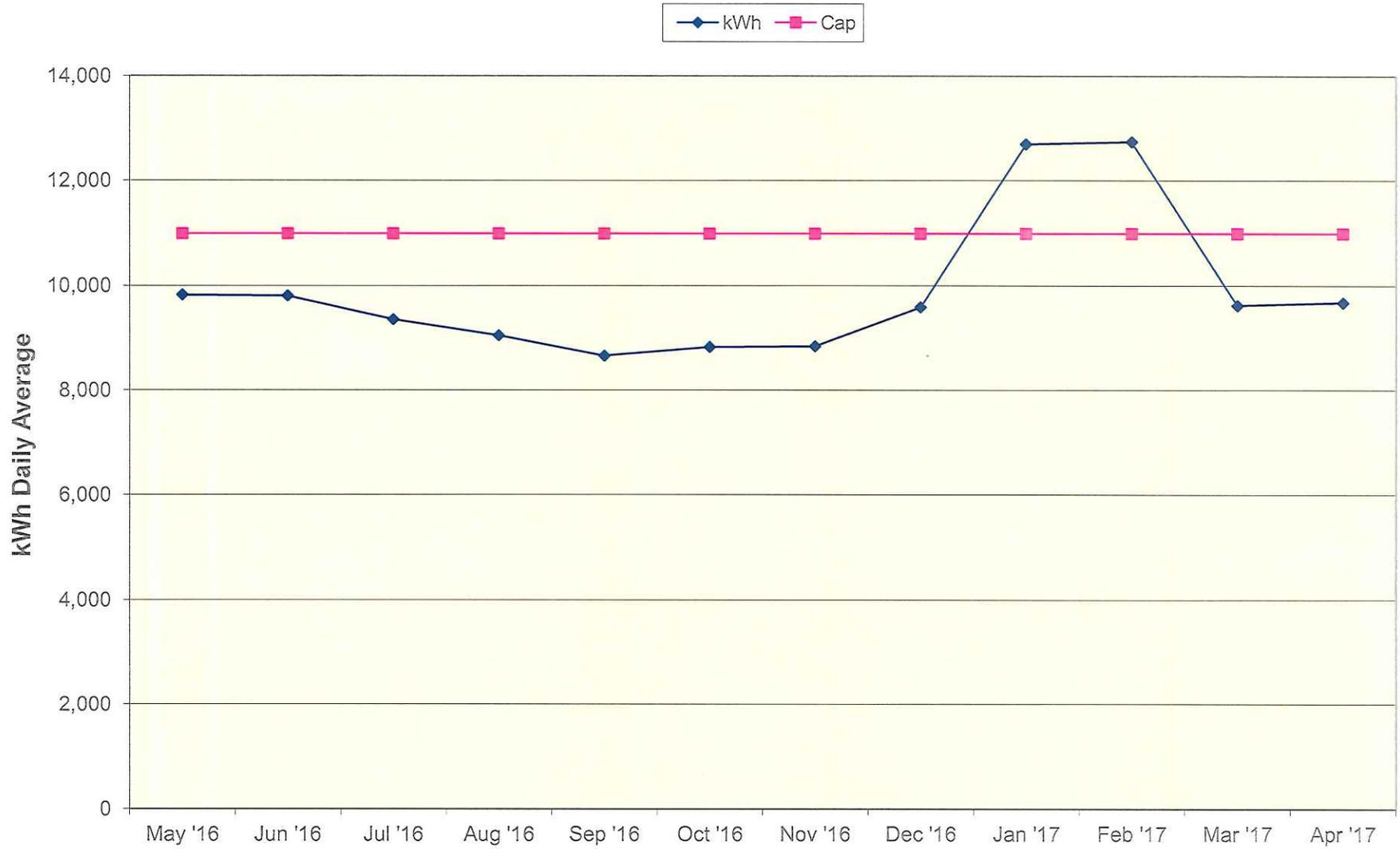
LIMITS - NPDES  
Entero 30 day geo mean 35 mpn /100ml



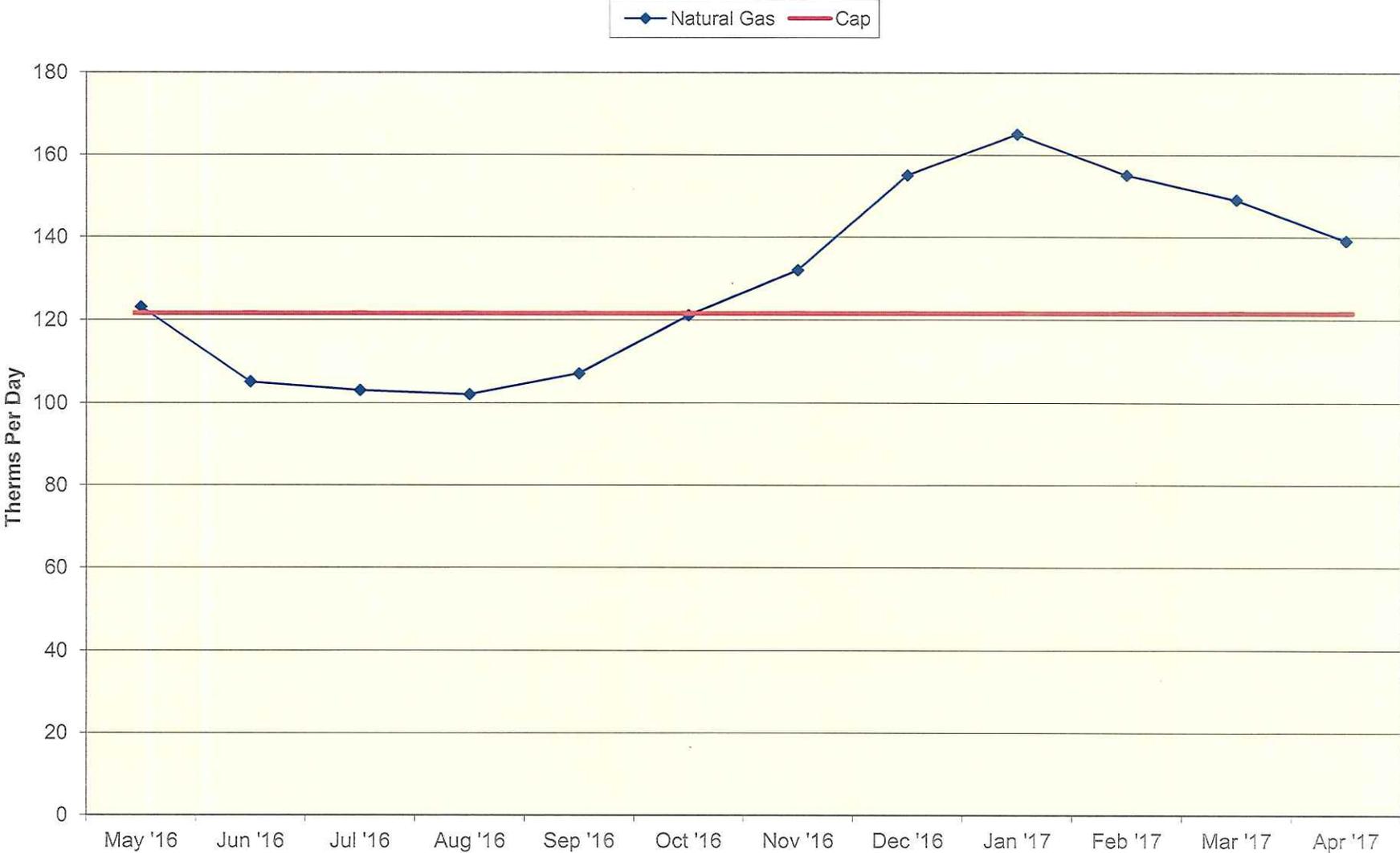
### Energy kWh/MG



# Energy kWh

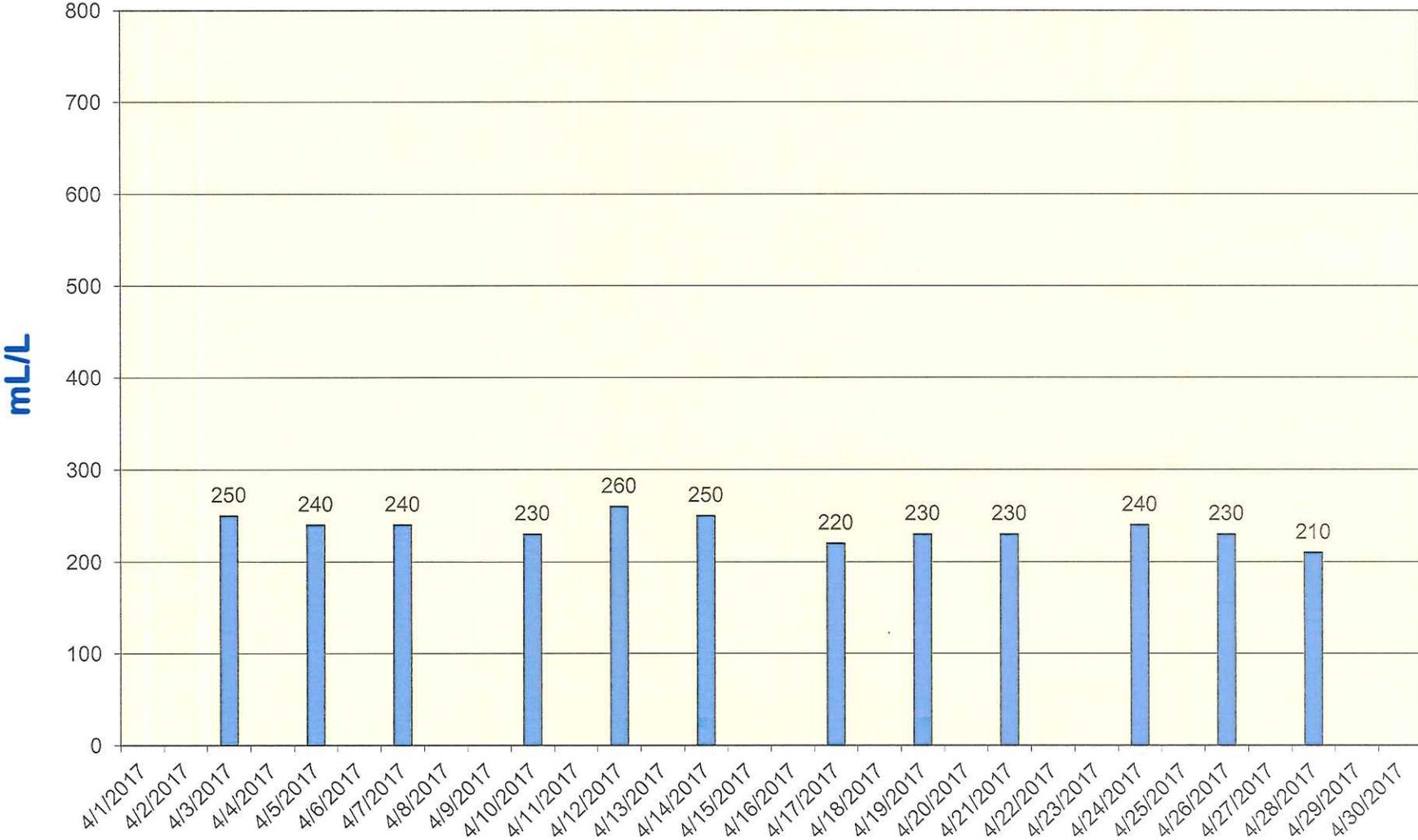


### Natural Gas Use

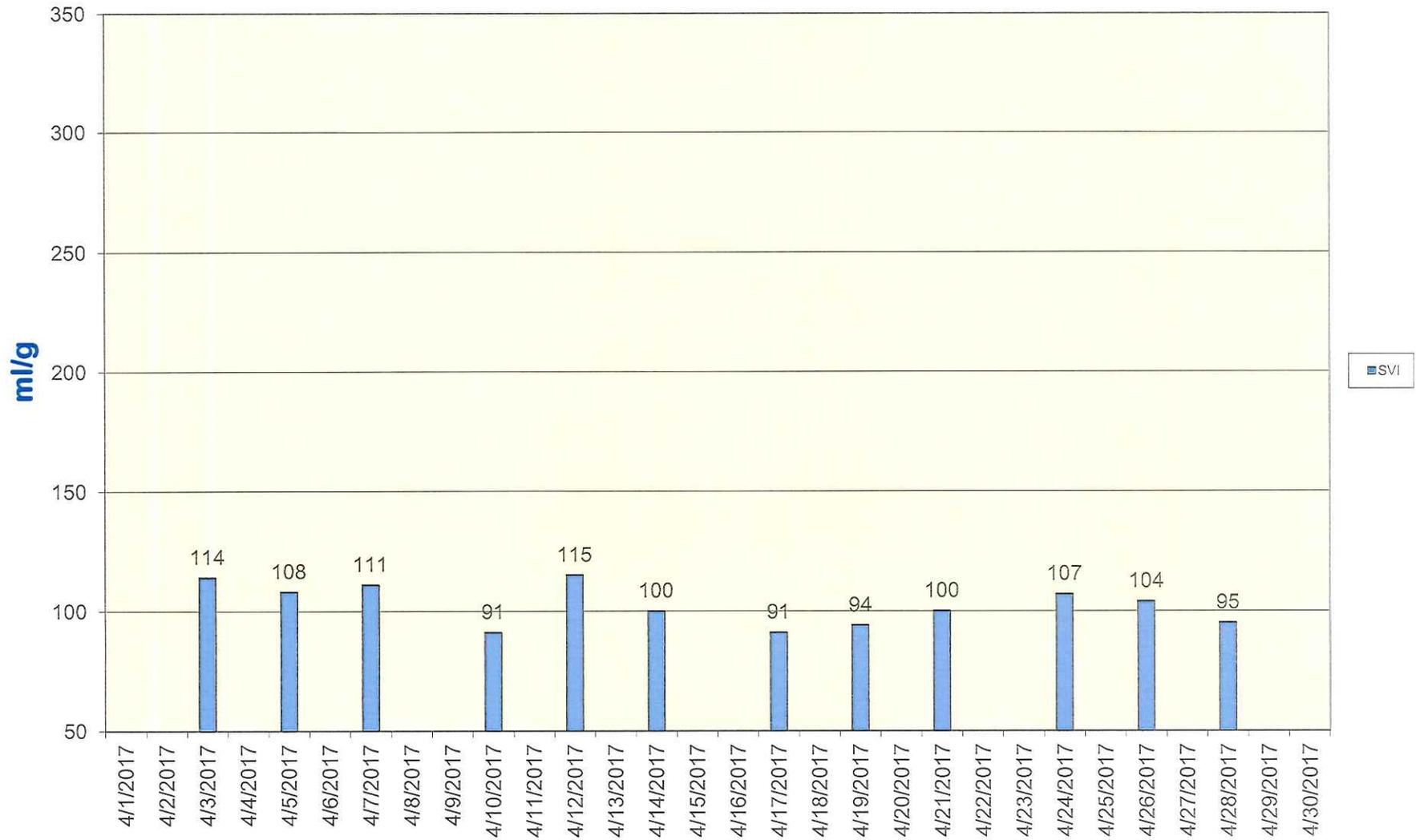


## ***5) PROCESS CONTROL DATA / GRAPHS***

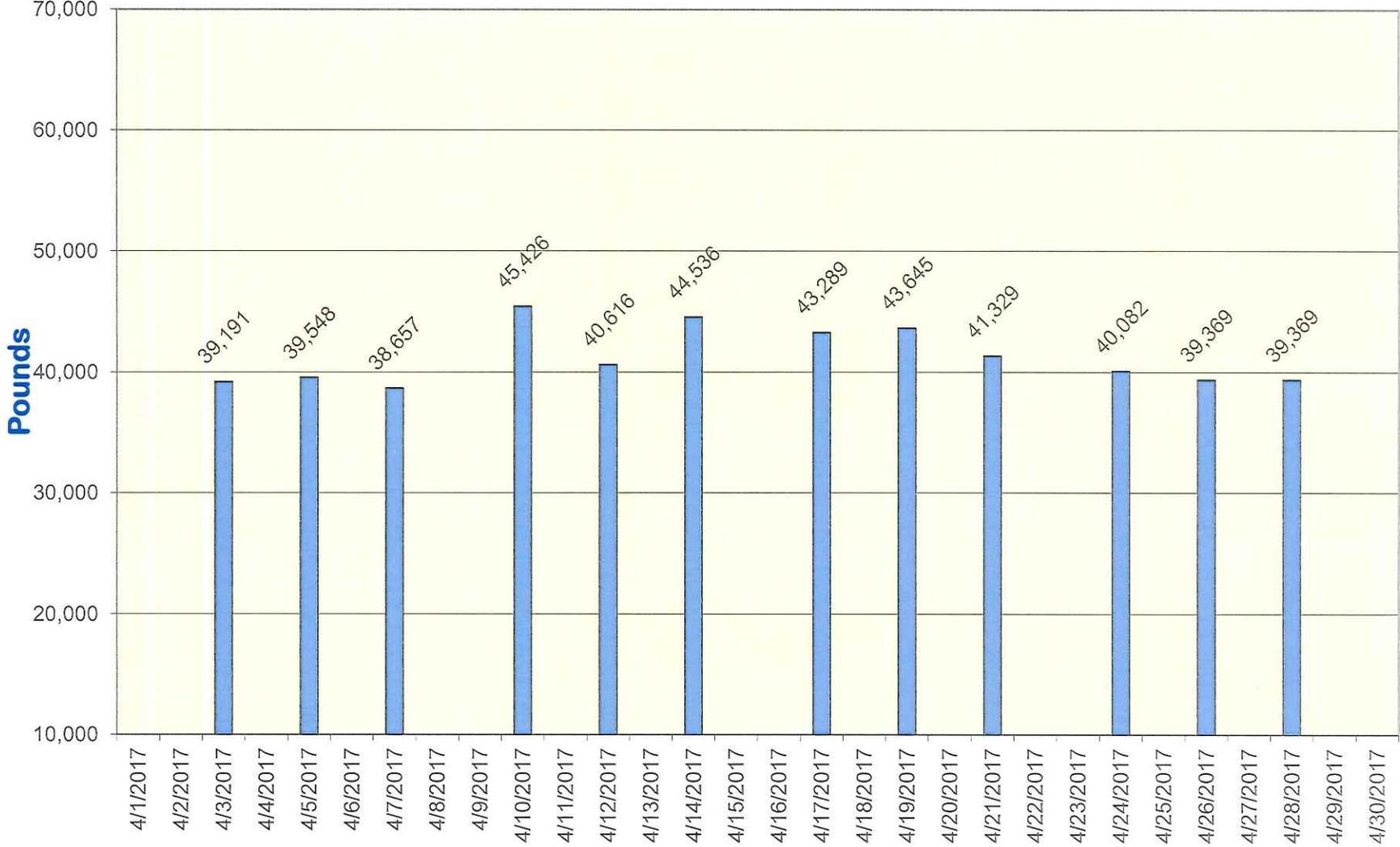
# Settleability



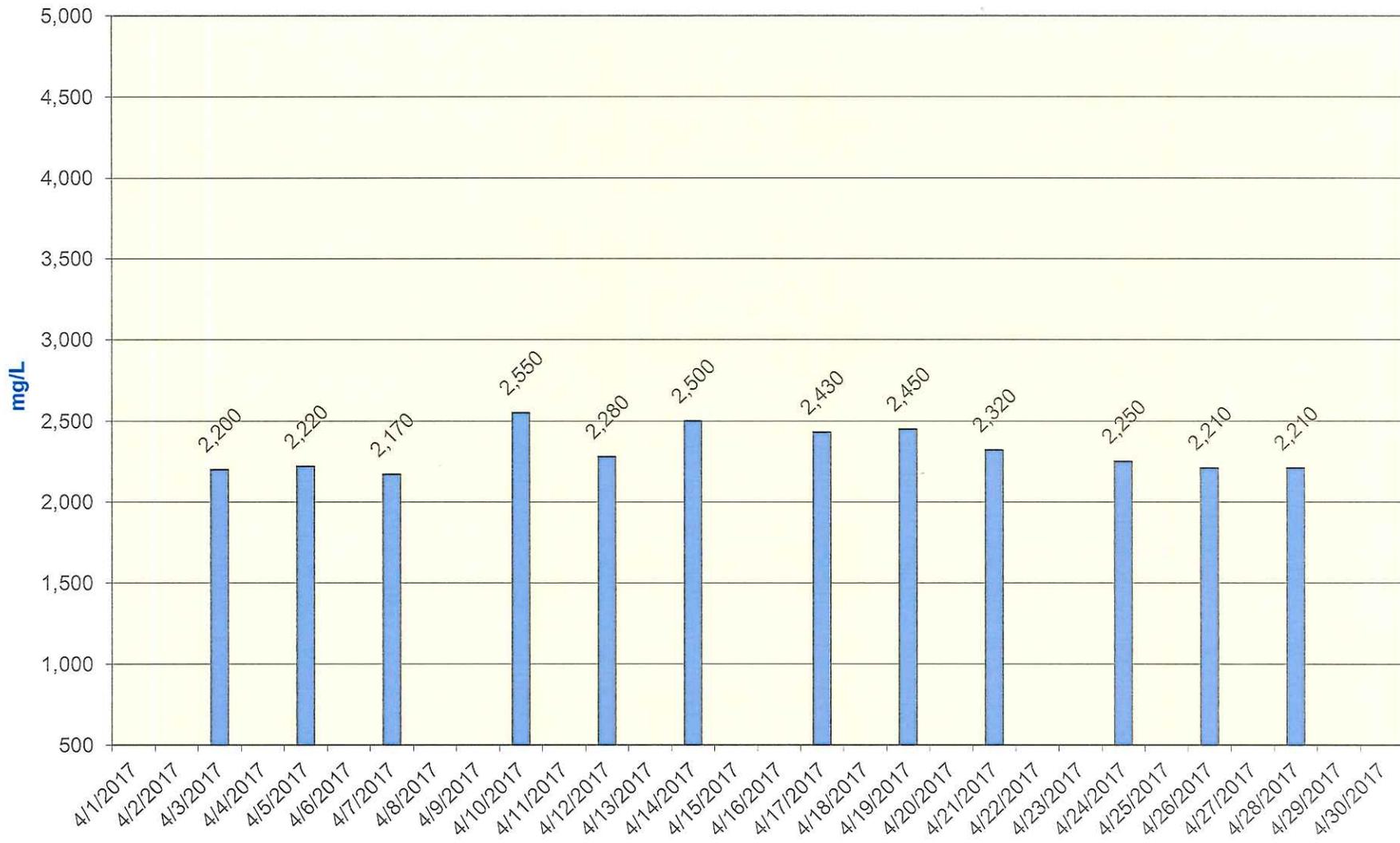
## Sludge Volume Index



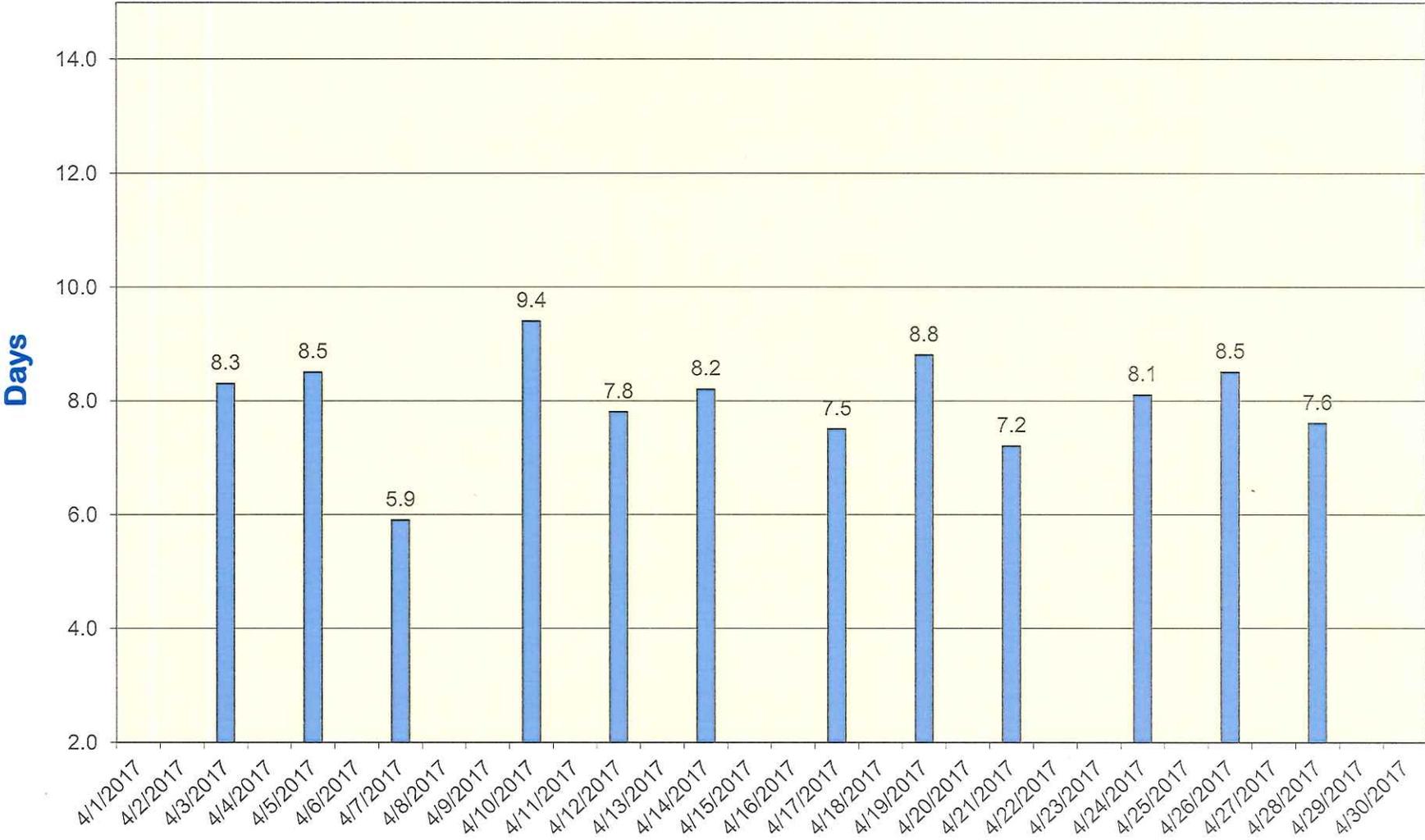
# MLSS Inventory



### MLSS Concentration



# Mean Cell Residence Time

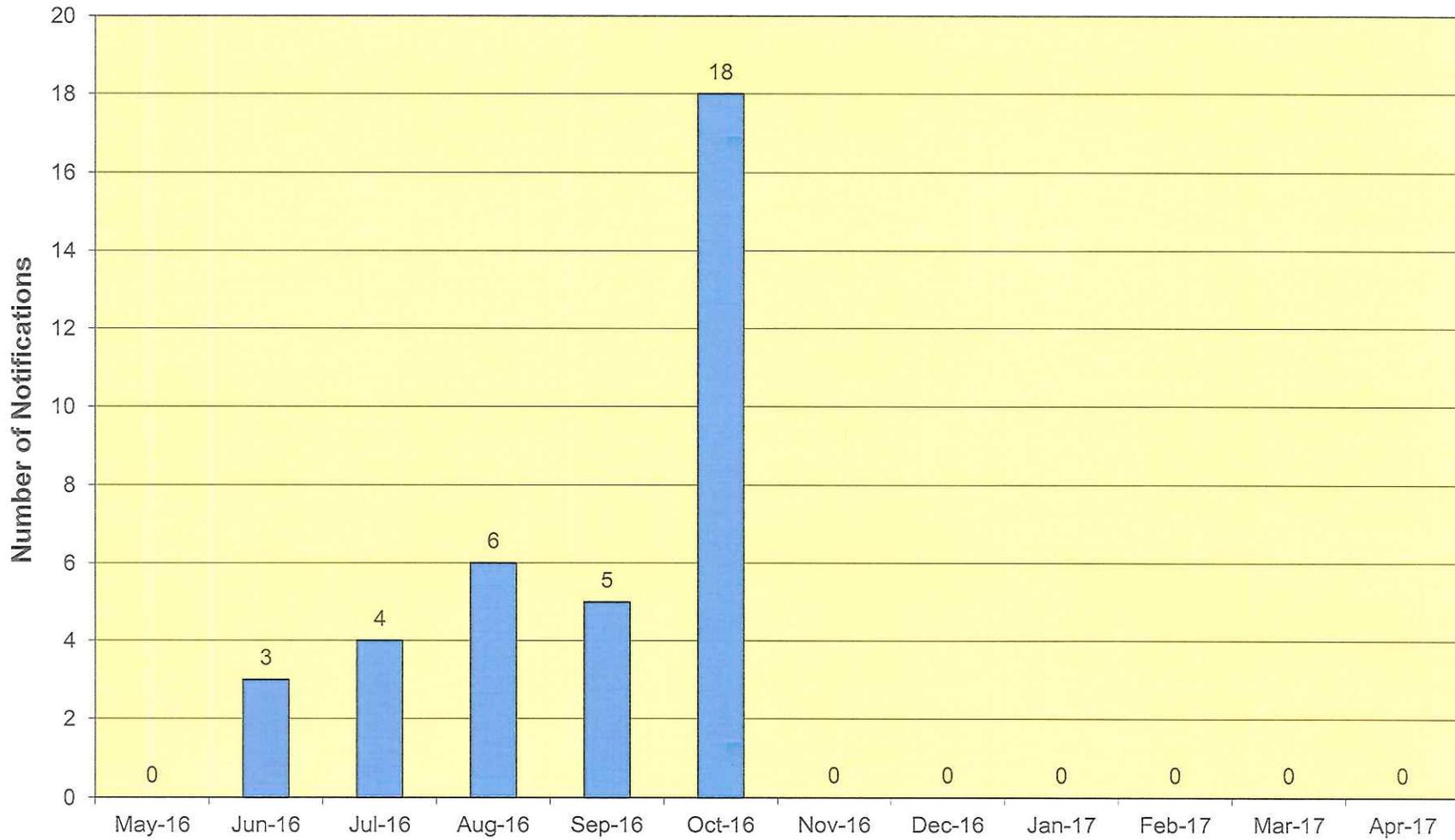


## Process Control Data

	Influent Flow	Settleability	MLSS Concentration	MLSS Inventory	F:M Ratio	MCRT	SVI
4/1/2017	5.84						
4/2/2017	5.30						
4/3/2017	5.37	250	2,200	39,191		8.3	114
4/4/2017	4.61						
4/5/2017	4.73	240	2,220	39,548	0.18	8.5	108
4/6/2017	8.71						
4/7/2017	11.53	240	2,170	38,657		5.9	111
4/8/2017	10.76						
4/9/2017	8.17						
4/10/2017	6.90	230	2,550	45,426		9.4	91
4/11/2017	6.66						
4/12/2017	6.07	260	2,280	40,616		7.8	115
4/13/2017	6.17						
4/14/2017	5.81	250	2,500	44,536		8.2	100
4/15/2017	5.71						
4/16/2017	5.96						
4/17/2017	6.09	220	2,430	43,289		7.5	91
4/18/2017	5.60						
4/19/2017	5.73	230	2,450	43,645		8.8	94
4/20/2017	5.57						
4/21/2017	5.25	230	2,320	41,329		7.2	100
4/22/2017	4.95						
4/23/2017	5.00						
4/24/2017	4.79	240	2,250	40,082		8.1	107
4/25/2017	4.86						
4/26/2017	4.57	230	2,210	39,369		8.5	104
4/27/2017	4.65						
4/28/2017	4.54	210	2,210	39,369		7.6	95
4/29/2017	4.47						
4/30/2017	4.75						
Minimum	4.47	210	2,170	38,657	0.18	5.9	91
Maximum	11.53	260	2,550	45,426	0.18	9.4	115
Total	179.12						
Average	5.97	236	2,316	41,255	0.18	8.0	103

## ***6) NEIGHBORHOOD CONTACTS***

## Neighborhood Contacts Received

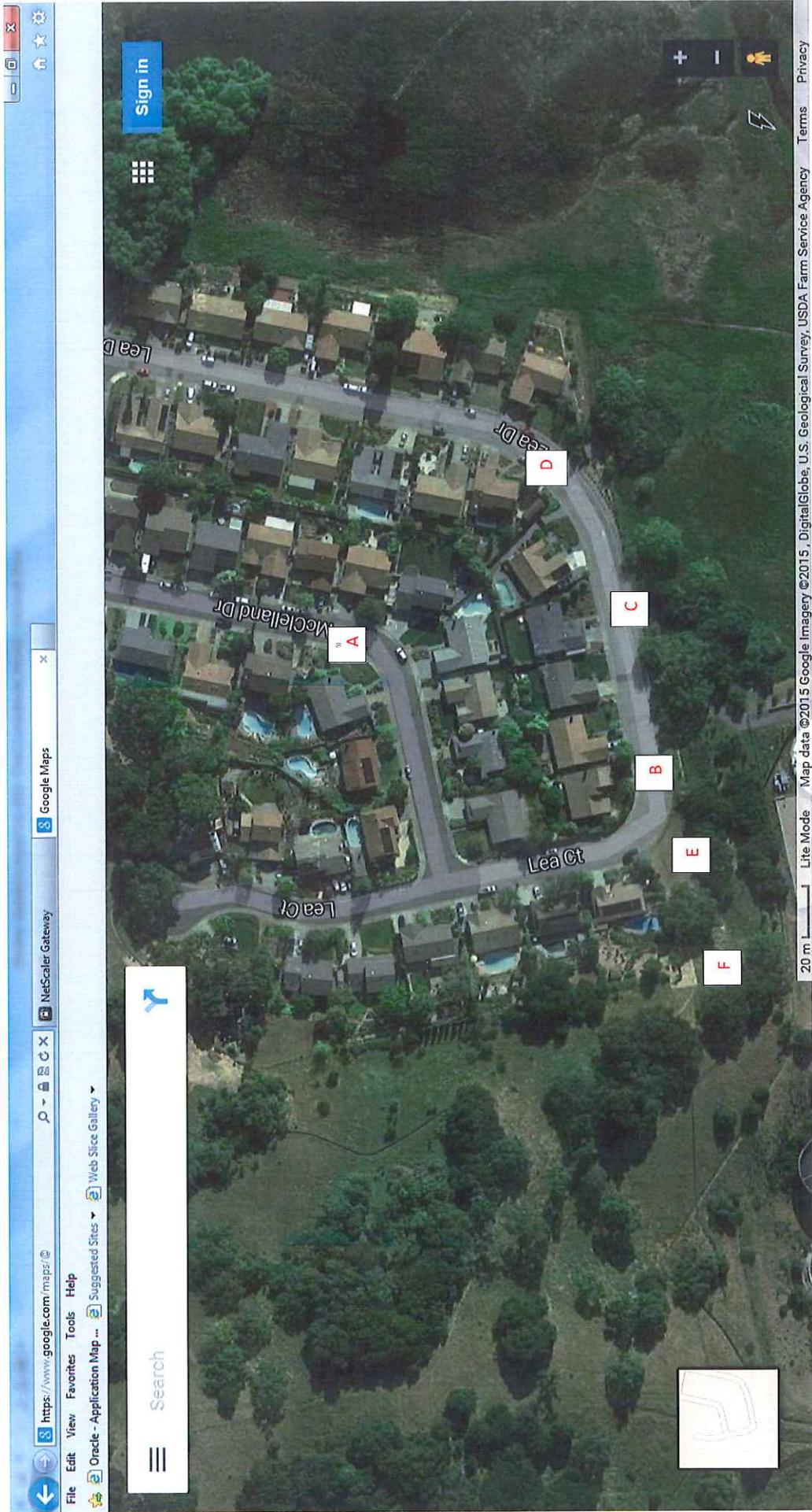


## ***7) JEROME METER READINGS & LOCATIONS***

JEROME METER READINGS - APRIL 2017

Sample Location	Min	Max	Ave	NOTES / COMMENTS
A: McLelland	0.000	0.000	0.0000	Neighborhood
B: Lea 1	0.000	0.000	0.0000	Neighborhood
C: Lea 2	0.000	0.000	0.0000	Neighborhood
D: Lea 3	0.000	0.000	0.0000	Neighborhood
E: Lea 4	0.000	0.000	0.0000	Neighborhood
F: Lea 5	0.000	0.000	0.0000	Neighborhood

# NEIGHBORHOOD JEROME METER LOCATIONS – LEA AND McCLELLAND



## ***8) EFFLUENT / OUTFALL – TRIBUTARY LEAK***



## ATTACHMENT 8

### LEAK OF TREATED EFFLUENT

#### Background:

On Tuesday, April 25, 2017, at 0817 hours, Novato Sanitary District Field Services Manager Steve Krauthem was notified of a "leak" near Junction Box #4 (JB4).

JB4 is a concrete box located about 1,000 feet east of the Ignacio Transfer Pump Station (the site of the former or decommissioned Ignacio Treatment Plant or ITP). The box serves as a transition junction structure for the District's Bay outfall pipe. It was originally designed to receive flow from the Novato Treatment Plant (NTP) through a 54-inch pipe on its north side, and flow from the now-decommissioned ITP through a 27-inch pipe on its west side, with the combined flow exiting towards the Bay through the 54-inch outfall pipe on the south side of the box. When the ITP was decommissioned, the 27-inch line was retained in inactive status instead of being decommissioned, with the thought that it could be re-purposed in the future to potentially provide a source of recycled water to the ITP site. Also, the original design did not provide for positive isolation between the 54-inch and 27-inch pipes, and flow from the 54-inch NTP pipe can enter the inactive 27-inch pipe while exiting through the 54-inch outfall. The leak was discovered on this inactive 27-inch Ignacio effluent pipe.

#### Regulatory Notification:

District and Veolia staff responded promptly to the site of the leak, and determined the potential cause (discussed below). Notification to the Regional Water Quality Control Board was made at 0855 hours with a follow-up (update) call at 1100 hours. We were advised to include a summary report with the April Self-Monitoring Report.

#### Potential Cause of Leak:

Upon inspection, the inactive 27-inch pipe was found to be in good condition. However, the above normal winter rains, flooding, and subsequent levee washout that occurred had potentially destabilized the pipe. The leak likely occurred at destabilized bell and spigot joint(s) over an approximately 60-70 ft length.

As noted above, there is no positive isolation between the 54-inch and 27-inch pipes in JB4, and flow from the 54-inch NTP pipe can enter the inactive 27-inch pipe while exiting through the 54-inch outfall, creating a back-and-forth "sloshing" effect within the 27-inch pipe. This effect may be exacerbated at certain times such as when the NTP flow is being pumped during high flow conditions, and the combination of this effect and the destabilization of the pipe joint likely led to the leak.

#### Corrective Action:

The District retained a construction contractor (Ghilotti Brothers, Inc. or GBI) to perform emergency repairs. GBI representatives responded to the location to determine equipment and staffing requirements. GBI was on site Wednesday morning (4/26) to re-route any leak from entering Arroyo San Jose to the adjacent pasture, and repair options were discussed. The selected option was to isolate the 27-inch pipeline from JB4 by installing a permanent concrete plug in it adjacent to JB4.

On Friday, April 28<sup>th</sup> GBI exposed the 27-inch pipeline and made preparations for the isolation work for

Monday, May 1<sup>st</sup>. Work was completed Monday morning (May 1<sup>st</sup>), and the 27-inch pipe was permanently isolated with a combination of a temporary inflatable air plug and a permanent concrete plug to prevent future leaks. The inflatable air plug was required as flow into the 27-inch pipe from JB4 could not be completely stopped to place the permanent concrete plug. District and Veolia staff will monitor the air plug and remove it in the dry weather non-discharge season if required.

Volume of Leak:

Less than 1,000 gallons to Arroyo San Jose, estimated from the time of initial notification until flow from the leak was rerouted to the pasture. It is important to emphasize that the leaked water is high quality final effluent from an advanced secondary treatment plant.

Conclusion:

Although the inactive 27-inch pipeline may have had some potential future value as a possible source for recycled water, it was determined that the risk of a failure outweighed this potential benefit. The connection could be reestablished at some point if needed. The concrete plug should provide a reliable fix and future leaks are not anticipated.



**9) LABORATORY PROFICIENCY TESTING  
CERTIFICATE OF EXCELLENCE**

## CERTIFICATE OF EXCELLENCE

In recognition of the quality of your laboratory in proficiency testing for  
WP-266

Novato Sanitary District Laboratory

is issued this certificate of achievement by ERA. This laboratory has been recognized as a Laboratory of Excellence for achieving 100% acceptable data in this study which included 1061 participating laboratories. This achievement is a demonstration of the superior quality of the laboratory in evaluation of the standards listed below.

Demand	Hardness
Minerals	pH
Simple Nutrients	Total Residual Chlorine
Turbidity	WasteWatR™ Coliform MicrobE™
WasteWatR™ Coliform MicrobE™ - SM 9221	



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Patrick Larson  
Quality Officer

N593601



# Novato Sanitary District Wastewater Operations - Collection System Operations Report April 2017

## 1.0 General:

An equivalent of about seven (7) full time employees (FTE) worked in the Collection System Department (Collections) during the month. The breakdown of staff time for the month in terms of equivalent full-time employee hours utilized, works out approximately as follows:

- 1.5 FTE field workers for sewer maintenance (main line cleaning)
- 1.1 FTE field workers for pump stations' maintenance
- 0.5 FTE field workers for closed circuit television (CCTV) work
- 1.5 FTE field workers for time spent on data input, training, service calls, overflow response, or any other activity that does not directly relate to main line cleaning, CCTV work, pump station maintenance, or special activities (e.g. smoke testing of mainlines), and
- An equivalent of 2.4 FTE field workers for vacation, holiday or sick leave.

## 2.0 Collection System Maintenance:

Performance metrics for the department are presented in the attached graphs showing the length of line cleaned/month, footage cleaned/hour worked, overflows/month, and the CCTV footage achieved. A brief discussion is also provided below.

### Line Cleaning Performance

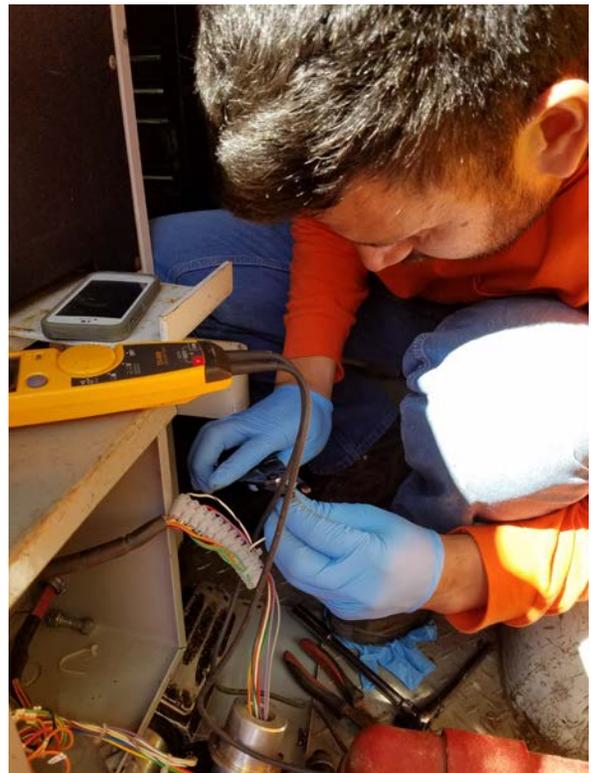
The sewer system ICOM3 Computerized Maintenance Management System (CMMS) generated 281 work orders for the month. Collections staff completed 281 work orders, leaving zero work orders outstanding. The 281 maintenance work orders completed resulted in 56,955 feet of sewer pipelines cleaned by staff.

### CCTV Performance:

The District's CCTV van was in the field for six working days in April and televised 47 line segments, totaling 8,727 feet of sewer main inspected. Staff also conducted 7 sewer main inspections, totaling 749 feet, using the push camera.

### CCTV Findings:

- Infrastructure related: CCTV work did not identify any areas that require immediate spot repairs.
- O&M related: CCTV work did not identify any area that would require a change in sewer line maintenance operations.



Troubleshooting CCTV Issues

## 3.0 Pump Station Maintenance:

Collections staff conducted 211 lift station inspections this month, of which 91 inspections were generated through the District's JobsCal Plus CMMS system. There are two (2) outstanding work orders for the month - zero correctives

**Novato Sanitary District  
Wastewater Operations - Collection System Operations Report  
April 2017**

and two (2) preventives. A Collection Systems (Pump Stations) Work Order Statistics summary is attached.

**4.0 Air Relief/Vacuum Valves (ARVs):**

Staff completed maintenance inspections on four (4) air relief/vacuum valves.

**5.0 Safety and Training:**

General: Collections Department staff attended four (4) safety tailgate meetings in April.

Collections Department staff assisted safety staff Dale Thrasher and Katy Thelen with a safety assessment of all District pump stations.

Specialized training: Two staff members attended the Annual CWEA State Conference in Palm Springs.

The Collection Systems Superintendent participated in a webinar presented by the California Sanitation Risk Management Authority, "Standard Operating Procedure and Lockout/Tagout Procedure Development Made Easy".

Safety performance: There were no lost time accidents this month, for a total of 2,240 accident free days since the last lost time accident.



**Pump Station Check Valve Maintenance**

**6.0 Miscellaneous Projects:**

An outside contractor continued work this month to install a new Air Relief/Vacuum Valve Vault in place of a junction manhole on the Dry Weather Force Main for the East Hamilton Pump Station. The project, located on the high point of the force main on Hamilton Parkway at Sunny Cove Drive, is nearing completion. The project has been delayed due to parts unavailability, including the specified cast iron cover for the structure.

**7.0 Standard Operating Procedures (SOPs):**

Collections staff created one new SOP draft for jump starting a vehicle battery.

Collections Department staff will be field testing the "SmartSOP" mobile app developed by DKF Solutions with support from CSRMA. The app is intended to make generating SOPs easier with the potential to create drafts on site while in the field.

**8.0 Sanitary Sewer Overflows (SSOs):**

There were zero (0) sanitary sewer overflows in April.

\*\*\*\*\*

Novato Sanitary District  
Collection System Monthly Report For April 2017 (as of April 30, 2017)

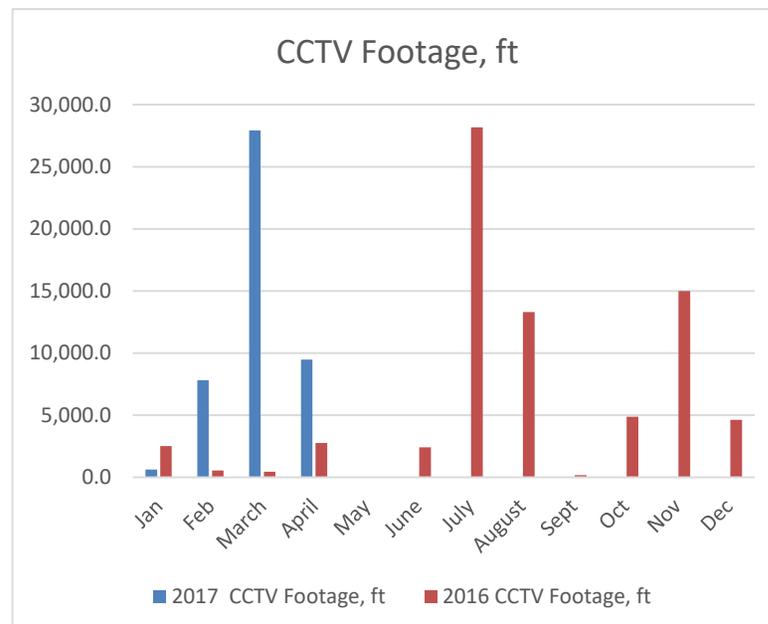
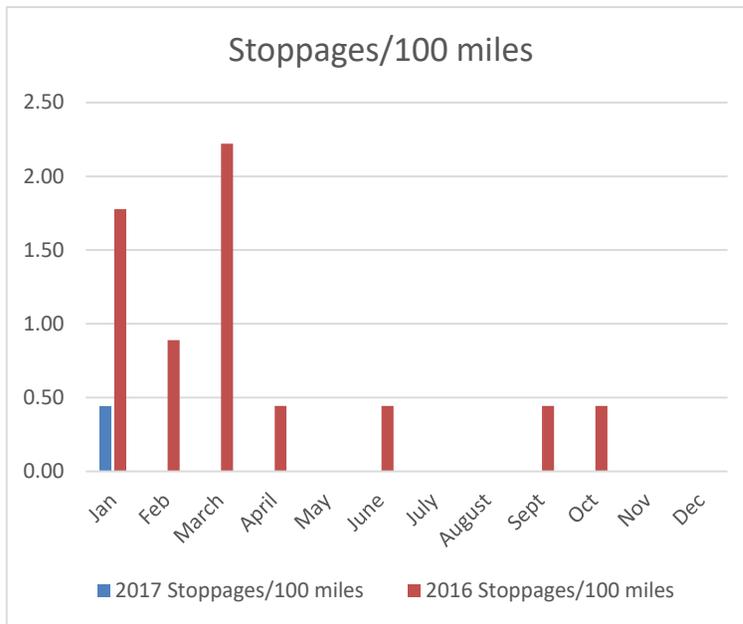
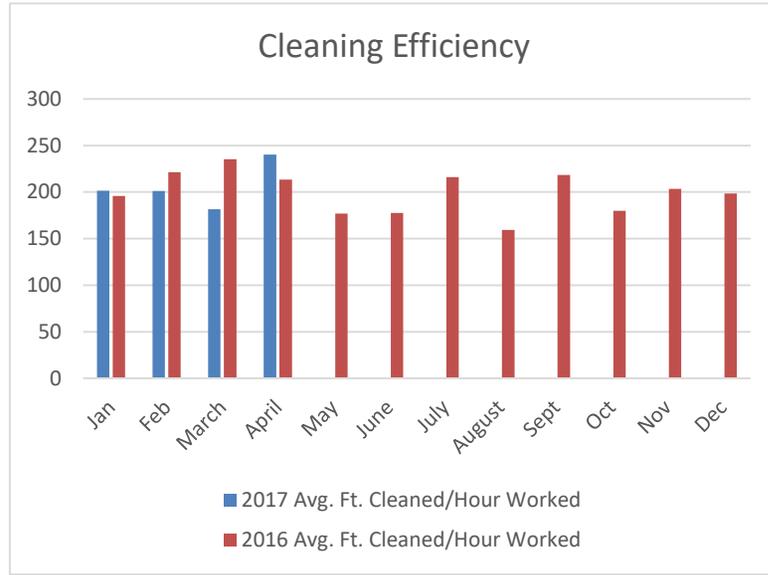
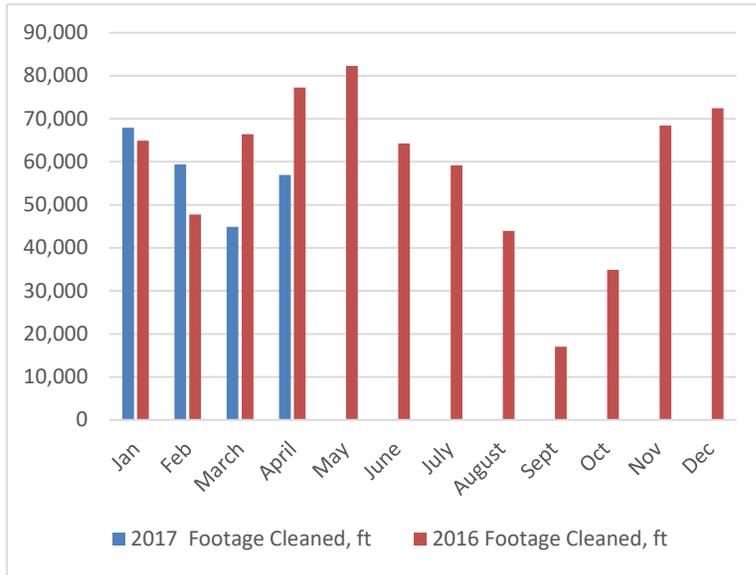
	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	Total Year to Date	Average Year to Date
<b>A. Employee Hours Worked</b>														
Number of FTEs (main line cleaning), hrs.	1.9	1.8	1.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.5
Number of FTEs (other)	2.0	1.7	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.6
Number of FTEs (CCTV)	0.0	0.4	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	0.2
Total, FTEs	3.9	3.9	4.3	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	1.3
Regular Time Worked, (main line cleaning), hrs	337	295	247	237										
Regular Time Worked on Other, hrs (1)	360	270	362	247										
Regular Time Worked on CCTV (2)	2	57	182	75										
Total Regular time, worked, hrs	699	622	791	559	0	0	0	0	0	0	0	0	2,671	223
Total Vacation/Sick Leave/Holiday, hrs	359	295	254	391									1,299	325
Vacation/Sick Leave/Holiday, FTEs	2.0	1.8	1.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.7	0.6
Overtime Worked on Coll. Sys., hrs	0	0	0	0									0	0
Overtime Worked on Other, hrs (1)	74	11	4	4									93	23
Overtime Worked on CCTV (2)	0	5	0	0									5	1
Total Overtime, hrs	74	16	4	4	NA	NA	NA	NA	NA	NA	NA	NA	98	25
<b>B. Productivity</b>														
<b>1. Line Cleaning</b>														
Rodder Work Orders generated	39	28	6	15									88	22
Rodder 3208 ft. cleaned	8,884	5,385	1,145	3,310									18,724	4,681
Rodder - outside services, ft cleaned	0	0	0	0									0	0
Flusher Work Orders generated	277	278	214	266									1,035	259
Truck 3205V ft. cleaned	8,395	12,037	512	776									21,720	5,430
Truck 3206V ft. cleaned	50,644	41,951	43,188	52,869									188,652	47,163
Flusher - outside services, ft. cleaned	0	0	0	0									0	0
Total Footage cleaned(3)	67,923	59,373	44,845	56,955	NA	NA	NA	NA	NA	NA	NA	NA	229,096	57,274
Work Orders completed	316	306	220	281									1,123	281
Work Orders backlog	0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
<b>2. Closed Circuit Television (CCTV)</b>														
Camera Work Orders generated	0	0	0	0									0	0
CCTV Truck 3126T, ft. videoed	0	7,055	27,927	8,727									43,709	10,927
CCTV (hand cam), ft. videoed	612	757	0	749									2,118	0
CCTV Inspection - outside services, ft. videoed	0	0	0	0									0	0
Total CCTV footage(3)	612	7,812	27,927	9,476	NA	NA	NA	NA	NA	NA	NA	NA	45,827	0
<b>C. Sanitary Sewer Overflows (SSOs)</b>														
Minor (Category III)	1	0	0	0									1	NA
Major (Category II)	1	0	0	0									1	NA
Major (Category I)	0	0	0	0									0	NA
Overflow Gallons	90	0	0	0									90	NA
Volume Recovered	0	0	0	0									0	NA
Percent Recovered	0%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0%	NA
<b>D. Service Calls (non-SSO related)</b>														
Service calls, normal hours, #	9	9	6	3									21	7
Normal hours S.C. response time, mins (avg.)	10	12	18	15									55	14
Service Callouts, after hours, #	0	1	0	0									1	0
After Hours S.C. response time, mins (avg.)	NA	30	NA	NA									30	30
<b>E. Benchmarks</b>														
Average Ft. Cleaned/Hour Worked	202	201	182	240	NA	NA	NA	NA	NA	NA	NA	NA	NA	206
Total Stoppages/100 Miles	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	NA
Average spill response time (mins)	0	0	0	0									NA	0
Callouts/100 Miles	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Overtime hours/100 Miles	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0
Overflow Gallons/100 Miles	39	0	0	0	0	0	0	0	0	0	0	-	39	3

(1)This category includes time spent on: Data input, Training, Service Calls, Overflow Response, as well as any other activity that does not directly relate to main line cleaning or CCTV work.

(2)This category separates time spent on CCTV from other Collection System maintenance activities.

(3) Does not include outside services (tracked separately)

# Collection System: 2017 & 2016 Graphs



**Novato Sanitary District**  
**Pump Station Monthly Report For April 2017 (as of April 30, 2017)**

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	Total Year to Date	Average Year to Date
<b>Employee Hours Worked</b>	218	239	276	205	0	0	0	0	0	0	0	0	938	
Number of Employees (FTEs)	1.2	1.3	1.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.4
Regular Time Worked on Pump Sta	190	203	235	172									800	
Overtime Worked on Pump Sta	28	36	41	33									138	
After Hours Callouts	3	3	6	4									16	
Average Callout response time (mins)	23	28	30	13									94	24
<b>Work Orders</b>														
Number generated in month	99	95	87	91									372	93
Number closed in month	99	95	87	91									372	93
Backlog	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**PUMP STATIONS  
WORK ORDER STATISTICS  
April 1, 2017-April 30, 2017**

	<b>Open Work Orders Due Prior to 4/1/2017</b>	<b>Open Work Orders 4/1/2017-4/30/2017</b>	<b>Total Open Work Orders</b>
Preventive	2	91	93
Corrective	0	0	0
Total	2	91	93

	<b>Closed Work Orders 4/1/2017 - 4/30/2017</b>
Preventive	91
Corrective	0
Total	91

<b>Total Outstanding Work Orders as of 4/30/2017</b>	<b>2</b>
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# NOVATO SANITARY DISTRICT

## Wastewater Operations - Reclamation Facilities Report April 2017

### 1.0 Summary:

The rancher began cutting pasture grass on Site 7 and completed annual weed abatement work in Parcel 28 this month. Staff completed mowing along the roadways on all Sites. Both Drainage Pump Stations continue to pump accumulated storm water from all Sites.

### 2.0 Ranch Operations:

The rancher began cutting pasture grass in Site 7, Parcel 8 on April 30<sup>th</sup>. This is a late start due to the lingering rainy season.

Weed mitigation was completed in Parcel 8 on Site 2. This was the only Parcel treated due to wet conditions elsewhere. This will be the only Parcel harvested on Site 2 due to the stunted grass growth from long term flooding in the other Parcels.

Drainage Pump Station No. 3 pumped 57.81 MG of storm water and Drainage Pump Station No. 7 pumped 64.49 MG of storm water this month.

Staff mowed the center and edges of most of the roadways throughout the Reclamation Sites. This will have to be completed again due to accelerated growth from an abnormally wet winter.

The backflow device on the water service for the Irrigation Pump Station/Site 3 was replaced after a Eucalyptus tree fell on it and crushed it.

### 3.0 Irrigation Parcels:

There were no irrigation activities this month.

As mentioned in prior reports, the electrical breaker for the valve actuators in Site 7 tripped earlier this year and the cause will be investigated once the pasture grass is cut & baled.

### 4.0 Irrigation Pump Station:

The Irrigation Storage Ponds level remained the same through the month.

### 5.0 Sludge Handling & Disposal:

There were no sludge handling activities this month.

**NOVATO SANITARY DISTRICT**  
**Reclamation Facility - Monthly Statistics for Calendar Year 2017, as of April 2017**

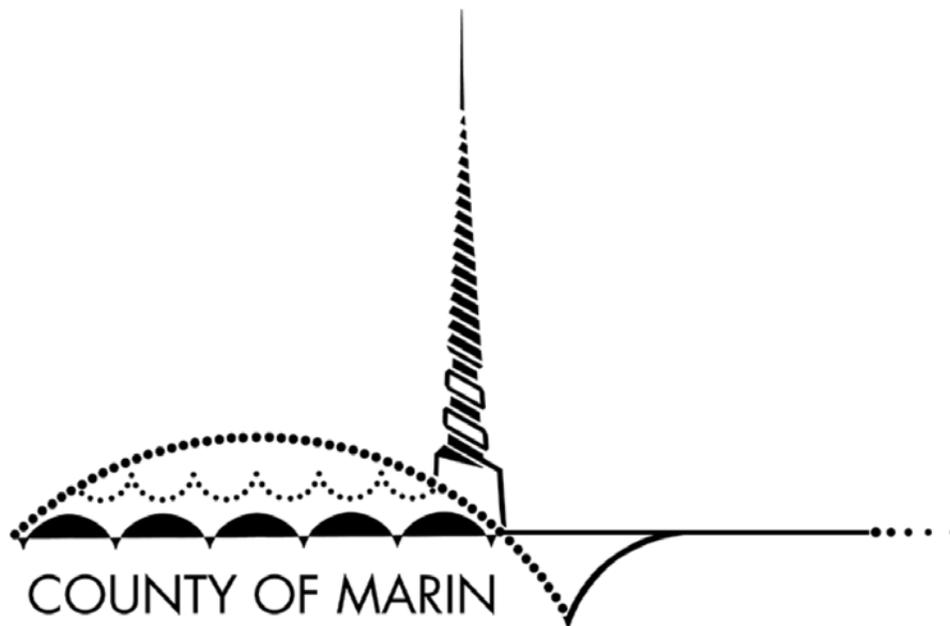
	January	February	March	April	May	June	July	August	September	October	November	December	Total Year to Date	Annualized Monthly Average
<b>Irrigation Pump Station</b>														
Plant flow to ponds (MG)		0	0	0	0								-	0.00
Irrigation (MG)		0	0	0.0	0								-	0.00
Irrigation Pump 1 Hours													-	0.00
Irrigation Pump 2 Hours													-	0.00
Irrigation Pump 3 Hours													-	0.00
Washdown Water Pump Hours													-	0.00
Wildlife Feed Pump Hours		0	0	0	0								-	0.00
Water Circulated through Wildlife Pond (MG)		0	0	0	0	0	0	0	0	0	0	0	-	0.00
Strainer No. 1 Hours													-	0.00
Strainer No. 2 Hours													-	0.00
Pond 1 Gauge @ Beginning of Month	8.1	9.5	9.4	9										
Pond 1 Gauge @ End of Month	9.5	9.4	9	9										
Pond 1 Gallons Stored @ End of Month(MG)	74	73	70	70										
Pond 2 Gauge @ Beginning of Month	8.1	9.5	9.4	9										
Pond 2 Gauge @ End of Month	9.5	9.4	9	9										
Pond 2 Gallons Stored @ End of Month(MG)	95	94	90	90										
Total Irrigation Water Stored	169	167	160	160	0	0	0	0	0	0	0	0		
<b>Drainage Pump Station No. 3</b>														
Drainage Pump No. 1 Hours	427.9	315.2	312.9	0										
Drainage Pump No. 2 Hours	69.3	123.5	0	0										
Drainage Pump No. 3 Hours	226.5	0	70.8	192.7										
Total Gallons Stormwater Pumped (MG)	217.11	131.61	115.11	57.81	0	0	0	0	0	0	0	0	521.64	43.47
<b>Drainage Pump Station No. 7</b>														
Drainage Pump No. 1 Hours	50.6	230.1	117.8	0										
Drainage Pump No. 2 Hours	380.8	532.8	0	0										
Drainage Pump No. 3 Hours	345.9	0	0	143.3										
Total Gallons Stormwater Pumped (MG)	349.79	343	53	64.49	0	0	0	0	0	0	0	0	810.59	67.55

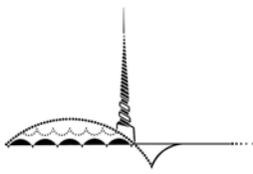
2016-2017 MARIN COUNTY CIVIL GRAND JURY

# Overcoming Barriers to Housing Affordability

Report Date: April 6, 2017

Public Release Date: April 12, 2017





## Overcoming Barriers to Housing Affordability

### SUMMARY

Marin is an expensive place to live, not only for low-income residents but also the average wage earner. This report offers solutions to improve housing affordability for all households. The residents of Marin experience the results of the high cost of housing in many ways, including the fact that our roadways are congested with the cars of commuters, the financial strain that high housing costs put on low and moderate income households, problems caused by homeless living on the streets, and the likelihood that our children will have to leave the county to find someplace where they can afford a home.

The Grand Jury researched how communities (both inside and outside of Marin County) have addressed key problems of housing affordability that could be applied throughout Marin:

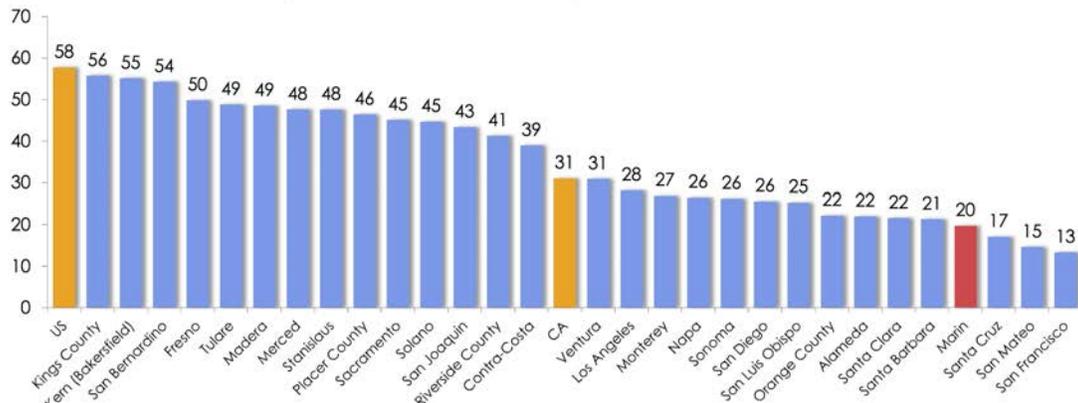
- **Community resistance** forms a barrier to virtually any new development in Marin. Vocal opposition serves to constrain the actions of civic leadership. Attempts to satisfy the needs of the developer and the needs of the community simultaneously are often ineffective. We highlight several examples where proactive involvement of the community with planners and developers has been successful in creating projects that are win-wins. We suggest that efforts to create early discussions between these parties will help to overcome this barrier.
- **It is expensive to build in Marin.** The high cost of land and construction form a formidable barrier to affordability, particularly in the case of low-income affordable housing. No one solution will completely overcome this barrier, but a creative approach to address some construction fees will make Marin more attractive for development.
- Developers cite **the planning process** in Marin as a clear barrier to progress. Regulatory delay becomes burdensome when developing low-income affordable housing. We suggest that models exist where successful early cooperation between developers, and planners, and neighborhoods has made the planning process more efficient. These models could easily be adopted across Marin's communities.
- **While housing affordability is a countywide problem, each of the 11 towns and cities of Marin and the County have their own approach to the problem.** Municipalities should coordinate available resources to develop low-income affordable housing that would benefit all of the citizens of Marin. This effort would be best coordinated through a central Housing Coordinator.

A problem as complicated as housing affordability is not easily solved and it will not be solved overnight. However, our research suggests that it should be possible to make incremental changes that will overcome some of the barriers to affordability. These changes form the recommendations made in this report.

## BACKGROUND

Scarcely a week goes by without housing prices being featured in local news. According to the California Association of Realtors, only 20% of households in Marin County could purchase a median-priced home in the fourth quarter of 2016. The chart below indicates that Marin is one of the least affordable counties even in the extremely expensive Bay Area.

2016-Q4: % able to purchase median-priced home



From: "[Housing Affordability in CA: by County.](#)" California Association of Realtors. Accessed on 8 Mar. 2017.

In this report, *housing affordability* refers to the measure of whether a typical household can afford to purchase or rent a typical home. The U.S. Department of Housing and Urban Development (HUD) guidelines suggest that housing is affordable if it requires less than 30% of household income. The latest HUD estimate for median household income in Marin County is \$107,720.<sup>1</sup>

This is a distinctly different concept from *affordable housing*. Affordable housing is subsidized by the government and available for occupancy by households that meet income thresholds specified by HUD, which defines "low income" as earning less than 50% of median household income.

Why is affordability a problem? Housing is too expensive for middle-income and lower-income households that include many of our public employees, retail employees and maintenance workers.<sup>2</sup> Spending too much of a household's monthly budget on housing impacts a family's ability to buy other basic needs: food, clothing, transportation, insurance, utilities, etc. The U.S. Census Bureau's Center for Economic Studies<sup>3</sup> reports that as of 2014, over 61,000 workers commuted into Marin each day, adding to the traffic problems that we see on our roads. The high cost of housing also increases the number of homeless on our streets, creates difficulties for senior citizens on fixed incomes keeping up with increasing rents, and challenges the most

<sup>1</sup> "[FY 2017 Income Limits Documentation System.](#)" Economic and Market Analysis Division, HUD. Accessed March 2017.

<sup>2</sup> "[County Of Marin: Workforce Housing.](#)" [video] The County of Marin. 14 May 2014.

<sup>3</sup> "[On The Map.](#)" The United States Census Bureau.

vulnerable segments of our population. Housing is unavailable as well for our next generation, resulting in an increasingly older population.

There are many benefits of creating a more affordable housing infrastructure. Environmental benefits will accrue if commutes can be shortened. Social benefits from increased diversity in our population will enrich our lives. Economic benefits will include an increased property tax base from new housing, as well as an increase in sales taxes if workers live here and shop here, rather than taking their dollars elsewhere.

The Grand Jury wrote this report in an effort to document the genesis of the Marin housing problem, understand the barriers, and offer some solutions that have worked elsewhere. We are under no illusion that there are quick or simple fixes. A problem that has taken decades to develop will not disappear overnight. However, we do suggest that it is time to address this problem in new ways.

## METHODOLOGY

The Grand Jury recognized that the investigation of the barriers to housing affordability would require a broad approach. Accordingly, the Grand Jury pursued the following:

- Conducted research into the physical and economic demographics of Marin County, including: population and economic/financial data, land use policies/constraints, housing supply/demand/cost characteristics and transportation infrastructure.
- Interviewed County department managers and staff associated with planning and approval of housing projects in Marin.
- Distributed a questionnaire to planning staff of the County and the 11 cities and towns of Marin seeking information regarding their low-income affordable housing policies, processes and fees.
- Reviewed Comprehensive Annual Financial Reports (CAFRs) of the County, cities and towns with a focus on expenditures for low-income affordable housing development.
- Interviewed people in various capacities who are involved in developing market rate and low-income affordable housing within and outside the County.
- Conducted research into Federal, California, County and municipal laws and regulations applicable to real estate development and low-income affordable housing (including housing elements and *Plan Bay Area*<sup>4</sup>).

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<sup>4</sup> [“Plan Bay Area 2040.”](#) *Plan Bay Area*.

- Researched issues and interviewed people from advocacy groups in support of developing low-income affordable housing throughout the county.
- Issued questionnaires to advocacy groups in opposition to the development of high-density housing and low-income affordable housing.
- Researched published papers and books by the advocacy groups cited above.
- Conducted research into conflict resolution strategies, programs and best practices.
- Researched successful approaches to reconciling the positions of housing developers and opponents of developments.
- Reviewed the history of recent low-income affordable housing projects with attention to the processes, costs, development time frames and community acceptance.
- Obtained local utility district connection fee estimates.

## DISCUSSION

California's Legislative Analyst Office 2015 report *California's High Housing Costs: Causes and Consequences*<sup>5</sup> lists significant factors why coastal areas (like Marin) have not built enough housing, including community resistance to such new housing, environmental reviews that can be used to stop or limit housing development, and limited vacant developable land. The goal of this Marin County Civil Grand Jury report is to showcase proven solutions to affordability barriers. These solutions could be implemented separately. However, since many of the barriers are interconnected we believe that by integrating them together into civic practices, our citizens will see long-term improvements in housing affordability.

In this report, the Grand Jury focused on these specific barriers:

- Community Resistance
- Too Expensive to Build
- Planning Process
- Low-Income Affordable Housing Faces Unique Challenges
- Myths & Perceptions

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<sup>5</sup> ["California's High Housing Costs: Causes and Consequences."](#) California Legislative Analyst's Office.

## Barrier: Community Resistance

If you show up at a planning hearing to complain about a proposed project in your neighborhood, your single voice is unlikely to matter. Therefore, you decide to form a coalition with your neighbors. The coalition would hold meetings, write letters, make phone calls, post signs, and demand the local officials *do something*. This is democracy in action.

What if a proposed project is upsetting: a high-density housing project (that will *add* to traffic), a homeless shelter (that will bring in *undesirable* people), a flood detention basin (that *might* cause local flooding), or a low-income housing development (that will *decrease* property values)? The coalition might agree that the project is for the “greater good,” but is not appropriate for the neighborhood. To protect yourselves from the “big guys,” you might hire the services of a lawyer to find a way to stop or slow down this project (“level the playing field”). In Marin County, these reactions are common for civic projects.<sup>6</sup>

**Solution: Regular Developer Meetings.** Before developers formally file plans for housing developments, they should meet with the local planning staff to anticipate likely challenges. Planning departments advise developers on regulatory issues, but often what frustrates planning approval are “the neighbors.” Planners can advise the developer on “hot button” issues they are likely to face before they set the formal public planning process in motion.

**Example:** Since 2012, the City of Petaluma has conducted weekly Development Review Committee meetings to brainstorm with developers. In attendance are a number of city departments including fire, building, planning, public works, water resources and conservation, code enforcement, economic development, and housing. City staff advise developers of what potential issues could be controversial and suggest ways to adjust the project scope to minimize issues. These might include proactive meetings with neighborhoods or increasing the scope of formal planning notices. Developers appreciate this streamlined approach that saves both time and money. The City staff benefit from an improved collaborative environment.

**Solution: Community Outreach.** The issue of where to place a civic project has been well studied for over 40 years and is referred to as “Facility Siting” (see Appendix A: Facility Siting). Nimbyism (“Not In My Backyard”) is the understandable reaction of a community to a poor public planning process and lack of trust in government. By proactively reaching out to the entire community, using “plain speak,” and with no hidden agenda, facilitators can help all the parties talk out the issues at outreach meetings with the goal that people will arrive at an agreeable understanding.

**Example:** In 2007, Homeward Bound of Marin was getting ready to design *The Next Key Center* (32 affordable studio apartments and room to grow their culinary program) on a parcel of the decommissioned Hamilton base in Novato. Before they started the formal planning process, they did a major outreach effort to their surrounding neighbors. Rather than holding large meetings, they chose to meet one-on-one with the neighbors. They shared their plans (“We’re thinking of...”), asked the neighbors about their concerns (“What do you think?”), and tried to address these concerns in their plan. Their goal was to ensure that everyone had a chance to be heard so that their public planning hearings would be well supported. Their new facility opened in November 2008.

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<sup>6</sup> Spotswood, Dick. [“It’s hard to get anything done in our county.”](#) *Marin IJ*. 27 Sep. 2016.

**Example:** In 2003, the Citizens Advisory Committee released to Mill Valley City Council the *Miller Avenue Precise Plan*,<sup>7</sup> which detailed the “year-long process to examine the future of Miller Avenue in terms of land use and street character, traffic and circulation, market and economics, and implementation and sustainability.”<sup>8</sup> In May 2007, City Planners conducted two community workshops to get feedback on possible improvements. Soon after, a nine-person steering committee founded the *Friends of Mill Valley* as a reaction when “...the committee's outline became, in effect, a draft plan because of a need to get the plan moving ahead.”<sup>9</sup> City Council was “baffled by the growing opposition.”<sup>10</sup> *Friends of Mill Valley* held a series of town meetings to discuss long-term policy changes (affecting land use and residential properties) that were proceeding without sufficient public input. After four years of planning, the project was now at a standstill. In response to community pressure, a Design Advisory Committee (with liaisons from City Council, Planning Commission, and five citizen experts) was formed by the City of Mill Valley in 2009, and during the next two years resulted in numerous workshops, focus groups, and extensive committee meetings. In 2011, the *Miller Avenue Streetscape Plan* was adopted by City Council<sup>11</sup> and groundbreaking on the project began on June 13, 2016.<sup>12</sup>

**Solution: Specific Plans.** In Marin County it is not uncommon to have a developer purchase a parcel, create a development plan, file the plan with the planning department, and because of community resistance, have their project slowed down, scaled back, or simply die. Such delays and uncertainty are expensive for the developers. The result is that developers choose to build in less “risky” counties. Municipalities are then planned piecemeal, on an individual parcel basis. If a community adopted a *Specific Plan*, many of these problems would disappear. A Specific Plan is a comprehensive planning and zoning document for a defined geographic region.<sup>13</sup> The upfront work of creating the plan allows citizens to work together to define a specific community vision and have the municipality establish the detailed land use and design regulations. Developers wishing to build on a parcel in the Specific Plan would be able to move forward secure in the knowledge that extensive work to create building plans and construction documents would not be wasted.

**Example:** In 2011, Redwood City adopted the Downtown Precise Plan,<sup>14</sup> designed to rejuvenate the city’s downtown area. It provided a blueprint for development of the city’s downtown through 2030, and as amended includes: plans for retail uses, building placement (including building heights and sizes), and housing development (including low-income affordable housing). To date over 2,336 new housing units have been approved or constructed (213 of which are affordable).<sup>15</sup>

The most frequent criticism of new projects in Marin is additional traffic congestion. With traffic on major roads at or nearly-at capacity during commute hours, even having a few additional cars on the road could make a bad situation intolerable. Traffic is a real problem, and in many locations congestion serves as an insurmountable barrier to new construction. While the subject

<sup>7</sup> “Historical Information - Streetscape Plan Meetings and Documents (2003-2011).” *City of Mill Valley*.

<sup>8</sup> “Miller Avenue Precise Plan.” *City of Mill Valley*, 3 Feb. 2003

<sup>9</sup> Speich, Don. “Citizen brigade, Mill Valley council clash on vision for city.” *Marin IJ*, 28 May 2007

<sup>10</sup> Ibid.

<sup>11</sup> “[Miller Avenue Streetscape Plan \(adopted 2011\)](#).” *City of Mill Valley*.

<sup>12</sup> “[Miller Avenue Streetscape Plan: History & Background](#).” *City of Mill Valley*.

<sup>13</sup> “[The Planner’s Guide to Specific Plans](#).” *Governor’s Office of Planning and Research*.

<sup>14</sup> “[Downtown Precise Plan](#).” *Redwood City*.

<sup>15</sup> Silverfarb, Bill. “[Redwood City allows for more affordable housing](#).” *The Daily Journal*. 2016 May 2016.

of transportation infrastructure is sufficiently complex to warrant its own Grand Jury report, we believe that careful study of traffic, and a creative approach to local conditions can serve as a starting point towards mitigating the effects of new construction.

**Solution: Reduce School-Related Commute Hours Traffic.** School-related traffic is a significant component of commute traffic. Displacing cars with school buses will reduce traffic congestion during school transit hours.

**Example: Coordinated Countywide Student Transportation Study.** To address congestion caused by parents ferrying their children to and from schools the Marin Transportation Authority and the Marin County Office of Education cooperated in a study of widespread adoption of school busing in the county in 2015.<sup>16</sup> The study concluded that while the geographic features of Marin make large scale busing difficult in some residential areas, the majority of county schools would benefit from extended bus service.

While the funding of a comprehensive school bus program is significant, costs are substantially less than those required by increasing road capacity. The recent adoption of a subsidized school bus program in Tiburon is an excellent example of the benefits. An article in the Marin Independent Journal<sup>17</sup> noted a 40% reduction in commute-hour traffic after the implementation of a voluntary bus program by the Reed Union School District.

**Solution: Concentrate on Local Traffic Congestion Issues.** Not all congestion issues are a result of California Highway 101 commute traffic. Investigating local road congestion could also have significant benefits. Changing local traffic flow is less expensive than costly new road construction.

**Example: Mill Valley Traffic and Congestion Reduction Advisory Task Force.** In 2015, the City of Mill Valley studied traffic capacity<sup>18</sup> with a goal of restoring transit times in the city's two main arteries – Blithedale Avenue and the Almonte Boulevard/Shoreline Highway – to that of 2012-2013.

The study noted a number of projects that contributed to reductions in traffic, including a pilot school bus program (as noted above), staggering of school hours, and retiming of traffic lights at critical intersections. Mill Valley, County and state agencies met, shared traffic data, and quickly resolved jurisdictional issues.

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<sup>16</sup> [“Coordinated Countywide Student Transportation Study.”](#) *Marin Transit*. Nov. 2015.

<sup>17</sup> Krawitt, Carl. [“Marin Voice: Tiburon Peninsula school buses are worth the investment.”](#) *Marin IJ*. 18 Jul. 2016.

<sup>18</sup> [“Traffic Task Force Subcommittee Meeting - City Concludes Traffic Task Force, Sends Detailed Report to Council.”](#) *City of Mill Valley*.

## Barrier: Too Expensive to Build

Long heralded for its strong environmental stewardship, Marin County has designated 80% of its land for either open space or agricultural use.<sup>19</sup> Because residents did not want to compromise Marin's natural beauty and small-town character, municipalities have enacted low-density zoning laws. The limited amount of suitable vacant land for housing has caused parcel prices to dramatically increase. Zoning regulations hamper developers, who would normally build more units on such expensive land to maximize their return on investment. While these constraints are particularly severe in the case of developers wishing to build housing that is affordable to low- and moderate-income families, they are significant for any housing construction.

**Solution: Stimulate Public-Private Partnerships.** In 1945, the California Legislature gave local governments the power to form a redevelopment agency (RDA) to revitalize a deteriorated area. While most of this initial funding came from the Federal government, it allowed local governments to issue bonds and attract private investment. In 1952, Proposition 18 established a new financing structure, which allowed local governments to redistribute property tax revenue for the project area. However, it was not until legislation was passed in the late 1970s (Senate Bill 90 and Proposition 13) that RDAs became widespread because of loosened definitions of "deteriorated" and increased funding choices; this in turn caused public-sponsored construction to grow dramatically (which required that 15 percent of all new housing in an RDA be affordable to low- and moderate-income residents). RDAs grew so much in number (and size) that by 2008, they received 12 percent of state property tax revenue, and were putting other government programs in jeopardy.<sup>20</sup> By 2012, the RDAs were dissolved, and the successor agencies (usually local governments) were assigned the responsibility of paying off the RDAs' debt. During their existence, RDAs built over 100,000 units of housing.<sup>21</sup>

The Low-Income Housing Tax Credit (LIHTC) currently gives local governments the ability to issue tax credits to private investors for "the acquisition, rehabilitation, or new construction of rental housing targeted to lower-income households."<sup>22</sup> Since 1995, over 107,000 units of low-income housing were created.

**Example:** In 2011, the Dublin (California) Housing Authority, Housing Authority of the County of Alameda (HACA), affordable housing developer Eden Housing, and for-profit homebuilder KB Home were able to revitalize 150 units of old public housing and convert them into a vibrant, mixed-use, mixed-income community (130 affordable family rentals, 50 affordable seniors' rentals, 184 market-rate homes, and 14 below-market-rate homes). The Urban Land Institute awarded this project the 2014 winner of the "Jack Kemp Excellence in Affordable & Workforce Housing Awards."<sup>23</sup>

**Example:** In 2013, ROEM Development Corporation, the City of Mountain View, Google, and Citi Community Capital built Franklin Street Family Apartments with 51 units for households earning up to 50% of the area's median income.<sup>24</sup>

<sup>19</sup> "[Marin At a Glance 2015 Annual Report](#)." *County of Marin*.

<sup>20</sup> "[Redevelopment Agencies in California: History, Benefits, Excesses, and Closure](#)." *U.S. Department of Housing and Urban Development/Office of Policy Development and Research*.

<sup>21</sup> "[Spotlight on Redevelopment](#)." *Seifel Consulting, Inc.*

<sup>22</sup> "[Low-Income Housing Tax Credits](#)." *Office of Policy Development and Research (PD&R) U.S. Department of Housing and Urban Development*. 15 May 2016.

<sup>23</sup> Johnson, Alison. "[2014 Jack Kemp Award Winners and Finalists](#)." *Urban Land Institute*. 23 Oct. 2014.

<sup>24</sup> "[Public-Private Partnership Funds Affordable Housing near Transit](#)." *Office of Policy Development and Research (PD&R) Edge Magazine*.

**Solution: Junior Accessory Dwelling Units.** Effective January 2017, Assembly Bill 2299<sup>25</sup> and Senate Bill 1069<sup>26</sup> amended state law to make it easier for homeowners to create legal accessory dwelling unit (ADU) rentals on their property: reducing minimum lot sizes, reducing utility connection fees, and reducing parking requirements. Furthermore, Assembly Bill 2406<sup>27</sup> established a new type of second unit called a “junior accessory dwelling unit” – created by adding an “efficiency kitchen” (no gas or 220 volt appliance) to an existing underutilized bedroom (maximum 500 square feet).

**Example:** In 2014, Novato City Council adopted Ordinance 1595 amending its zoning code to allow for junior accessory dwelling units (JADUs) and reduced their development fee. Based on Novato’s request, local sanitary and water districts eliminated their connection fees for JADUs, and the Novato Fire Marshall waived sprinkler and fire separation requirements. The result saves homeowners wishing to create a JADU over \$40,000 in fees.<sup>28</sup> In 2016, Novato received applications for and approved two junior accessory dwelling units. In 2017, the Marin Community Foundation awarded Lilypad a \$200,000 grant to help homeowners turn spare bedrooms or other spaces into accessory dwelling units.<sup>29</sup>

**Solution: School Districts’ Teacher Housing.** California Senator Mark Leno authored the Teacher Housing Act of 2016 (Senate Bill 1413) that was signed into law by Governor Brown on September 27, 2016. This bill provides that “a school district may establish and implement programs that address the housing needs of teachers and school district employees who face challenges in securing affordable housing. To the extent feasible, the school district may establish and implement programs that, among other things, do the following: (a) Leverage federal, state, and local public, private, and nonprofit programs and fiscal resources available to housing developers, (b) Promote public and private partnerships, (c) Foster innovative financing opportunities.”<sup>30</sup> Before this bill was passed, taxpayer funds could not be used for restricted (school staff only) housing.

The nonprofit and nonpartisan Learning Policy Institute’s report *Solving the Teacher Shortage*<sup>31</sup> agreed that “lack of affordable housing is one reason teachers leave the profession or leave districts with high costs of living.” Because of teacher turnover, school districts have to continually invest in recruitment, since new teachers cannot afford to live in Marin County. Providing subsidized housing for teachers will give school district administration another tool to attract top-quality staff.

**Example:** In 2002, the Santa Clara Unified School District built Casa Del Maestro (“House of the Teacher”) on land it owned (and is now operated and managed by the nonprofit Santa Clara Teacher Housing Foundation) using no taxpayer funds. With a typical monthly rent of \$1,500 for a two bedroom unit in the complex (compared to an average market rent of \$3,134<sup>32</sup>), the school district has seen teacher turnover drop to below average.<sup>33</sup>

<sup>25</sup> [“AB-2299 Land use: housing: 2nd units. \(2015-2016\).” California Legislative Information.](#)

<sup>26</sup> [“SB-1069 Land use: zoning. \(2015-2016\).” California Legislative Information.](#)

<sup>27</sup> [“AB-2406 Housing: junior accessory dwelling units. \(2015-2016\).” California Legislative Information.](#)

<sup>28</sup> [“Junior Accessory Dwelling Units.” League of California Cities.](#)

<sup>29</sup> Mara, Janis. [“Lilypad gets grant to help Marin homeowners create in-law units.” Marin IJ.](#) 7 Feb. 2017.

<sup>30</sup> [“Teacher Housing Act of 2016 \[53570 - 53574\].” California Legislative Information.](#)

<sup>31</sup> [“Solving the Teacher Shortage.” Learning Policy Institute.](#)

<sup>32</sup> [“Rent trend data in Santa Clara, California.” Rent Jungle.](#) Accessed Jan 11, 2017

<sup>33</sup> [“How one Bay Area school district is making sure teachers aren’t priced out.” KALW Public Radio.](#)

**Example:** Beginning in 2005, the San Mateo Community College District created two housing developments for faculty and staff. “The District is able to build first class, market rate housing and offer below-market rents because 1) it owns the land (land costs do not need to be included in the cost of ownership or operations); 2) it financed the project with a tax-exempt issue; 3) the property is property-tax exempt; and 4) the District does not have a profit motive. Rents from the project are set at a level that is sufficient to pay back all costs of construction, financing, maintenance and operations and fund a long-term capital reserve.”<sup>34</sup>

**Solution: Identify Underutilized Parcels.** “Marin County has an abundance of many things: hiking trails, water views and great farm-to-table food. But try buying a vacant lot here and you’ll discover what we lack most. Simply put: We have no lots.”<sup>35</sup> California State Law “mandates that local governments adequately plan to meet the existing and projected housing needs of all economic segments of the community.”<sup>36</sup> This plan is referred to as a *Housing Element*. Contained in the housing element is a land inventory that includes both vacant and underutilized parcels that may be considered development opportunities. Before a housing element is finalized, the public is invited to comment.<sup>37</sup> In Marin, because of fears of showcasing growth opportunities, citizens often request that many vacant and underutilized parcels be removed from the Housing Element’s land inventory.

Rather than depend upon a highly politicized process, it would be more transparent for the County to prepare a publicly available and easily obtainable map of all incorporated and unincorporated vacant and underutilized parcels in Marin.

**Example:** As part of the development of the 2012-2035 Portland Plan, the City of Portland, Oregon’s Bureau of Planning & Sustainability released the *Development Capacity Analysis geographic information systems (GIS) model*.<sup>38</sup> The model was used to create the Buildable Lands Inventory (BLI),<sup>39</sup> which was used to provide data to address their “big” questions.<sup>40</sup> As a result, “permitting continues to exceed production levels, offering an indicator that the city may continue to see growth in the number of new housing units added to the city stock in 2016 and 2017.”<sup>41</sup>

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<sup>34</sup> “[Staff Housing Development](#).” *San Mateo Community College District*.

<sup>35</sup> Hilgers, Laura. “[Not a Lot of Lots](#).” *Marin Magazine*. April 2014.

<sup>36</sup> “[Housing Elements and Regional Housing Need Allocation](#).” *California Department of Housing and Community Development*.

<sup>37</sup> “[Marin County - List of sites to be evaluated in the SEIR for the 2007-2014 and 2014-2022 Housing Element planning periods](#).” *County of Marin*.

<sup>38</sup> “[Development Capacity Analysis GIS model](#).” *City of Portland*.

<sup>39</sup> “[Buildable Lands Inventory \(BLI\)](#).” *City of Portland*.

<sup>40</sup> “[The Portland Plan](#).” *City of Portland, Oregon*.

<sup>41</sup> “[State of Housing Report in Portland](#).” *Portland Housing Bureau*. December 2016.

## Barrier: Planning Process

The planning process in Marin cities and towns is unpredictable and time-consuming. A developer faces different regulations in every municipality. In addition, developers in every city, town, and the unincorporated County face the costs of compliance with the California Environmental Quality Act (CEQA) that may require extensive environmental reviews as well as time consuming public comment. As stated in a report issued by the McKinsey Global Institute entitled *A Tool Kit to Close California's Housing Gap*,<sup>42</sup> “the statute has come under scrutiny for enabling any opponent to a project ... to delay or block the project by threatening a lawsuit under CEQA. Generally speaking, if a project opponent files a CEQA lawsuit, the project cannot commence until the litigation is resolved in favor of the government and the project sponsor. This can delay projects by months or years, and adds substantial risk to the entitlement process.”

Approvals for new housing can take anywhere from six months to over three years depending upon the complexity of the project and public opposition. Long delays in the approval process can lead to lost opportunities and high costs for land holding, architectural planning, and legal expenses. McKinsey's report estimates that such costs can account for 30% of the total cost of a housing unit.

**Solution: Regular Developer Meetings.** As mentioned previously in “Barrier: Community Resistance,” arranging regularly scheduled meetings with developers, city or county planning officials, advocacy groups and the general public would better allow all interested parties to offer their input during each stage of the process.

**Solution: Improved Noticing.** Planning departments comply with legal noticing requirements for development projects. However, these notices are often filled with confusing legal terms that the average resident might not understand and instead choose to ignore. Later, when the project has moved to an advanced stage, a resident might hear rumors about the project and become angry that they were not adequately informed. Using *plain speak* and increasing noticing to a wider radius (than the minimum requirements) would lead to a more informed community much earlier in the process and fewer delays by opposition later.

**Example:** A few examples of municipal planning notices are showcased in Appendix B: Municipal Planning Notices. The Tiburon and Marin County notices are printed with small single-spaced type and filled with legal jargon. From Tiburon's: “The Planning Division is recommending a Mitigated Negative Declaration be adopted for the project pursuant to section 21080 of...” If a resident makes it through the first three paragraphs of the letter without his eyes glazing over, he might discover that written comments on the Draft Mitigated Negative Declaration/Initial Study will be accepted until 5:30pm. This type of language makes little sense to ordinary residents outside of planning commission circles. A better example might be the card circulated by Mill Valley that has the meeting date, location, and project contact in bold typeface at the top of the card, followed by a brief description of the project. It concludes with instructions for interested parties on submitting comments, relevant meeting dates and sources for further information. All relevant details are presented in very clear, precise and simple language.

**Solution: Community Outreach.** As previously discussed, developers should reach out to neighbors and other interested parties from the very beginning of the planning process, address concerns and incorporate suggestions whenever possible. By involving the public from the

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<sup>42</sup> “[A Tool Kit To Close California's Housing Gap: 3.5 Million Homes By 2025.](#)” McKinsey Global Institute.

outset, many objections can be resolved in open dialogue. Meetings should be held as often as necessary until everyone's opinions have been heard. It is difficult to find examples of good community outreach for Marin projects. The same public concerns, however, exist in other Bay Area locations. In Napa, objections are often seen to the construction of new wineries. An example of how to reach out to the community in a positive way is seen in the following:

**Example:** Constructing a new winery in Napa County evokes strong neighborhood reactions. “Questions from neighboring residents, growers and vintners about impacts on groundwater, traffic and rural character in the form of opposing public-hearing comments and letters as well as appeals of approvals have led the county Board of Supervisors over the past several months to call for better analysis of current conditions and community input.”<sup>43</sup> In 2016, Beau Vigne Winery did an extensive outreach before its hearing, resulting in “a show of support that the Planning Commission seldom sees in often-contentious winery times.”<sup>44</sup>

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<sup>43</sup> Quackenbush, Jeff. “[Counties grapple with winery outreach directly to consumers.](#)” *North Bay Business Journal*. 12 May 2015.

<sup>44</sup> Eberling, Barry. “[New Napa winery wins planner praise for neighborhood outreach.](#)” *Napa Valley Register*. 8 Sep. 2016.

## Barrier: Low-Income Affordable Housing Faces Unique Challenges

The current approach to planning low-cost affordable housing in Marin County is fragmented and lacks coordination. Each municipality has its own community development agency (CDA) that is focused on specific goals and priorities identified within its own boundaries. In addition, Marin County has a CDA that serves only the unincorporated areas of Marin. No single agency is tasked with the coordination and facilitation of solutions to housing-related issues that affect the entire region. For example, affordable housing that addresses the needs of the most vulnerable portion of Marin's population is administered by a combination of the Marin Housing Authority, Marin County Health and Human Services and a wide range of non-profit operators in locations scattered among the County, cities and towns. Section 8 housing vouchers provide federal funding to supplement housing costs for low-income families. The long waiting list for these vouchers is a clear indicator of unmet demand for additional subsidized affordable housing. Individually, each of the municipalities and the County has its own plan to address low-income affordable housing, but these plans have been ineffective at solving the problem.

Economic barriers add to the difficulty of constructing new housing and protecting existing low-income housing stock. The cost of buildable property is a major consideration, but in addition, developers face high costs for permits, energy and water hookups, and legal expenses. Complex requirements for environmental review and transportation infrastructure limitations are also complicating factors. Developers are economically motivated to look to areas with fewer restrictions and less uncertainty than in Marin County.

**Solution: In-Lieu Housing Fee Pooling.** Many communities require that developers of multi-unit housing set aside a percentage of units as affordable housing. Of the 12 jurisdictions in Marin (11 incorporated municipalities plus the unincorporated county) 7 allow the payment of housing fees in-lieu of building affordable housing units. These funds are then deposited in an account to be spent to increase the supply of housing (generally to be affordable to low and moderate-income residents). Outside of the City of Novato very little of this money has been expended for affordable housing, and for most of the jurisdictions, the account balances are too low to be useful (for a fund overview, see Appendix C: Affordable Housing In-Lieu Fees). Pooling these funds, with central administration at the County level, would best leverage the power of this money to stimulate the construction of affordable housing.

**Solution: In-Lieu Housing Fee Recalculation.** *“The Board of Supervisors concur that the in-lieu fees fail to generate sufficient revenue to support the amount of affordable housing needed in Marin County.”*<sup>45</sup> The City of San Rafael reported, *“our experience shows that accepting fees in lieu of providing units in developments under construction does not result in an increase in the number of affordable units.”*<sup>46</sup> If the goal of in-lieu housing fees is to stabilize and increase the amount of low-income affordable housing in the County, then there are insufficient in-lieu fund account balances to achieve this. Therefore, either local governments need to either not allow the payment of in-lieu housing fees (so low-income affordable housing is created) or in-lieu fees need to reflect the true cost of developing such housing.

**Example:** In 2016, the City of Pasadena commissioned the *Affordable Housing In Lieu Fee Analysis* study<sup>47</sup> in support of an inclusionary housing ordinance.<sup>48</sup> By analyzing the

<sup>45</sup> [Marin County Board of Supervisors response to 2002-03 “Financing Affordable Housing” Grand Jury report](#), 16 Sep. 2003.

<sup>46</sup> [City of San Rafael response to 2002-03 “Financing Affordable Housing” Grand Jury report](#), 30 Jun. 2003,

<sup>47</sup> [“Pasadena Affordable Housing In Lieu Fee Analysis.”](#) David Paul Rosen & Associates.

<sup>48</sup> [“Inclusionary Housing Ordinance.”](#) City of Pasadena.

rental housing affordability gap and predicting likely numbers of new construction, they were able to calculate a truer value for an in-lieu housing fee.

**Solution: Fast-track Low-income Affordable Housing Applications.** Low-income affordable housing developers face many obstacles that add costs to their projects. Giving priority to the processing of their applications through the various planning departments would be an easy way to shorten the timeline to construction and thus reduce cost. Several of Marin’s communities have procedures in place for fast-tracking. The County of Marin proposes to implement fast-tracking for unincorporated areas in 2017. Tiburon gives “highest processing priority” to affordable housing projects, and San Rafael reports that it has some policies in place “that encourage streamlined approaches of projects that qualify as affordable housing.” San Anselmo offers expedited processing for secondary units but not multifamily construction. Other Marin towns and cities do not have such provisions in place. Each of the towns and cities of Marin should implement fast-tracking of affordable housing projects, bringing these projects to the top of the planning review queue.

**Example:** Below-market-rate projects are fast-tracked through the City of Petaluma’s approval process. All processing time limits required by state law are adhered to.<sup>49</sup>

**Solution: Community Outreach.** Often community fears of the local impact of low-income affordable housing turn into vocal demonstrations. Contributing to these fears are perceptions of the impact of affordable housing on neighborhoods, for example the belief that affordable housing developments will drive down property values and attract undesirable residents. As noted in our section on planning process above, an aggressive program of involvement of nearby stakeholders should alleviate unsupported fears, and will allow developers and homeowners to work together to ensure that development works to benefit the community.

**Example: Oma Village.** Homeward Bound of Marin has recently opened Oma Village, a development of 14 units in Novato intended for residence by families that are leaving homelessness. Before entering into the planning review process, Homeward Bound contacted nearby residents individually to explain what they hoped to do. By carefully explaining the criteria for approval of applicants, and by making some changes to their architectural drawings to meet neighborhood concerns, they were able to smoothly move through planning review and begin construction of the Village.

**Solution: Reduce Costs Of Utility Connections.** Sewer, water, electricity, and gas connections add significantly to the cost of any new development (see Appendix D: Utility Connection Fee Estimates). Developers of market-rate housing are able to recoup these fees upon successful completion of a profitable project. These fees burden developers that follow a mission to provide low-cost affordable housing. Waiving or reducing connection fees would provide a major incentive to the developers of low-cost affordable housing.

**Example:** The City of Santa Cruz’s (California) municipal code allows for waivers of many development fees if they will assist in providing residential units that are affordable to low and very-low income households.<sup>50</sup> The fees eligible for waivers include: sewer and water connection fees, planning application and plan-check fees, building permit and plan-check fees, park land and open space dedication in-lieu fees, and fire fees.

<sup>49</sup> [“Housing Element 2015-2023.”](#) *City of Petaluma.*

<sup>50</sup> [“Chapter 24.16 Affordable Housing Provisions.”](#) *Santa Cruz Municipal Code.*

## Barrier: Myths & Perceptions

*“The great enemy of truth is very often not the lie – deliberate, contrived and dishonest – but the myth – persistent, persuasive and unrealistic. Too often we hold fast to the clichés of our forebears. We subject all facts to a prefabricated set of interpretations. We enjoy the comfort of opinion without the discomfort of thought.”*

– John F. Kennedy

Perhaps the most challenging barrier to tackle is that of altering long held misperceptions of a community. These beliefs are deeply entrenched and in many cases are based on myths. We collected a sampling of oft-repeated refrains from community meetings and the media and analyzed them for accuracy. We researched these issues to see if they had any merit (see Appendix E: Marin Housing Perceptions).

**Solution: Education.** Myths that continue to circulate in the community eventually become embedded in the belief system when they are continually repeated as if they were facts. Psychologists understand that to overcome misinformation, three psychological effects need to be considered: familiarity effect (emphasize the facts, not the myth), overkill backfire effect (simplify the message), and the worldview backfire effect (don’t argue, reframe the message).<sup>51</sup> Leadership must take a stance in public support of facts, using properly considered psychology, rather than reacting solely to community-wide fears.

**Example:** As a counterpoint to active NIMBY groups, YIMBY (*yes in my backyard*) activism and education has been spreading worldwide. YIMBYs are “generally younger than their opponents, mainly renters, many of them employed in the tech industry, they were driven to activism after they found themselves unable even to rent in San Francisco or Berkeley or Oakland, let alone buy.”<sup>52</sup>

**Solution: Deliberative Polling<sup>®</sup>** was created in 1988 by Professor James Fishkin of Stanford University. “Citizens are often uninformed about key public issues. Conventional polls represent the public's surface impressions of sound bites and headlines. The public, subject to what social scientists have called "rational ignorance," has little reason to confront tradeoffs or invest time and effort in acquiring information or coming to a considered judgment.”<sup>53</sup> The Deliberative Polling<sup>®</sup> process involves bringing together a sample of an affected population, sharing balanced briefing materials, and then having a dialogue with competing experts and political leaders.

Housing affordability has been a “hot topic” in Marin County for years. Former Supervisor Susan Adams “faced an unsuccessful recall effort in part due to her support for developing affordable housing at Marinwood”<sup>54</sup> and was voted out of office in 2014. From October 2015 to February 2016, the Board of Supervisors convened a series of *Preserving Housing Affordability* public workshops.<sup>55</sup> The Marin IJ wrote: “All but conceding that the drive to provide adequate affordable housing in Marin has been a failure, county officials are shifting gears, hoping that an aggressive strategy aimed at saving the housing that does exist while considering initiatives to slow soaring rents will bear fruit.”<sup>56</sup> As former Supervisor Steve Kinsey stated, “We’re becoming a rich, white, old community, and yet California is becoming a much more

<sup>51</sup> Cook, John and Lewandowsky, Stephan. “[The Debunking Handbook](#).” *Skeptical Science*. 23 Jan. 2012.

<sup>52</sup> Lucas, Scott. “[The YIMBYs Next Door](#).” *San Francisco Magazine*. 30 Nov. 2016.

<sup>53</sup> “[What is Deliberative Polling<sup>®</sup>?](#)” *Center for Deliberative Democracy, Stanford University*.

<sup>54</sup> Halstead, Richard. “[Bill to ease pressure on Marin to build more housing moves forward](#).” *Marin IJ*. 20 May 2014.

<sup>55</sup> “[Affordable Housing](#).” *Marin County Community Development Agency*.

<sup>56</sup> Johnson, Nels. “[Marin County officials: Rent control among strategies to preserve affordable housing](#).” *Marin IJ*. 11 Oct. 2015.

demographically diverse community, so there is a conflict there that has to be addressed.”<sup>57</sup>  
 While protecting the affordable housing status quo is a good goal, it is not enough.

**Example:** In March 2008, 238 scientifically randomly selected San Mateo County residents gathered for a weekend at Threshold 2008’s Countywide Assembly on Housing Choices. Commonly held housing beliefs changed as a result of this process.<sup>58</sup>

Housing Poll Question	Agree Before	Agree After
There is a need for more housing in the County	38%	68%
Any new housing should be located in already developed areas	61%	72%
New housing developments would be good for the environment	33%	44%
The County’s vital services like education, fire, police and health would suffer if there continues to be a shortage of affordable housing	46%	68%

<sup>57</sup> Halstead, Richard. “[Marin Supervisor Kinsey reflects on 20-year career.](#)” *Marin IJ*. 1 Jan. 2017.

<sup>58</sup> Greenway, Greg and Fishkin, James. “[Results of the San Mateo Countywide Assembly on Housing Choices.](#)” *Center for Deliberative Democracy, Stanford University*. March 2008.

## Introducing: The Regional Housing Coordinator

The Grand Jury believes that a number of the previous solutions (community outreach, in-lieu housing fee pooling, in-lieu fees to stimulation public-private partnerships, education, and case studies) could best be served through the creation of a County Regional Housing Coordinator.

The coordinator would:

- Commission a study to quantify the demand for new housing units.
- Work with funding sources and developers
- Work with cities, towns and the County to develop Specific Plans
- Identify underutilized parcels
- Explore opportunities for public-private partnerships
- Create a County-wide Civic mediation program for all civic project community dialogues
- Conduct Deliberative Polling<sup>®</sup> to build the public voice on housing choices
- Coordinate and analyze in-lieu housing fee usage

While each municipality would maintain local planning control, the Regional Housing Coordinator would ensure that County-wide issues such as subsidized housing, civic development, and funding would be a shared resource. Regional housing coordinators are found in other states, including:

- Nevada (Southern Nevada Regional Housing Authority)
- North Carolina (The Arc of North Carolina)
- Pennsylvania (Self-Determination Housing Project of Pennsylvania, Inc.)

Ironically, the June 2003 Marin County Grand Jury report (*Financing Affordable Housing: Local In-Lieu Fees And Set-Aside Funds*) recommendations included:

- The Board of Supervisors and the cities and towns should establish an appropriate mechanism for the coordination of all affordable housing activities in the County.
- The Board of Supervisors should support and cooperate with the various nonprofit housing agencies and developers within the County by including them in the implementation of the countywide housing programs.

In their September 16, 2003 response to the June 2003 Report, the Marin County Board of Supervisors wrote:

“Marin County, the Marin Community Foundation and the Major Employers of Marin are working collaboratively to develop a countywide housing trust fund. Each entity will be contributing cash and in-kind services to match funds established by the state for housing trusts. The goal is to generate six million dollars over the next five years to be used for affordable housing. All the cities and towns will be invited to participate in the Marin Workforce Housing Trust Fund. Their contribution will be matched dollar for dollar, which is a substantial incentive.

The Community Development Agency will begin to engage the Countywide Planning Agency that represents all the cities, towns and the County, to develop an effective strategic approach to address the housing needs of Marin County.”

The *Marin Workforce Housing Trust* (MWHT) was established in 2003 as a “public-private collaboration between various local businesses, the Marin Community Foundation and the County of Marin to support and encourage the development of affordable workforce housing throughout Marin County.”<sup>59</sup> Over the years, the MWHT issued a pre-development loan of \$283,210 to Eden Housing (for the construction of Warner Creek Senior Housing in Novato) and \$231,593 to EAH Housing (for the construction of Shelter Hill in Mill Valley). Because of difficulties finding other loan recipients, in 2010 the business community pulled out. By 2014, the Marin Community Foundation also stopped participating. In 2016, the Marin Workforce Housing Trust decided to cease operations (“The purpose of the Trust was to use funds raised for loans to support workforce housing. While this is a worthy and important endeavor, there is not enough affordable housing development in Marin County for a standalone organization to be feasible”<sup>60</sup>), and transfer its funds into Marin County's Affordable Housing Trust Fund.

While the Grand Jury applauds the establishment of the Marin Workforce Housing Trust, it is clear that simply offering affordable housing funds to low-income affordable housing developers will not improve the situation. During our investigation, we heard repeatedly from both nonprofits and funding sources that the challenge to building low-income and middle-income affordable housing isn't identifying funding sources, it is overcoming local political and community resistance.

That is why we suggest that the role of the regional housing coordinator must be financial (work with funding sources and coordinate in-lieu housing fee usage), research (identify underutilized parcels), and political (civic mediation and public polling). Unlike the June 2003 Report recommendations, the housing coordinator would not only focus on low-income affordable housing, but housing that is affordable for people who currently live and work in Marin.

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<sup>59</sup> [“Transfer of Marin Workforce Housing Trust Assets to the County's Affordable Housing Trust.”](#) *County of Marin*. 15 Nov. 2016.

<sup>60</sup> *Ibid.*

## CONCLUSION

The Marin County Civil Grand Jury believes, based on success in the Bay Area and nationwide, that many of the barriers that challenge housing affordability can be overcome using solutions detailed in our Discussion:

- Community Outreach
- Concentrate on Local Traffic Congestion Issues
- Deliberative Polling<sup>®</sup>
- Education
- Fast-track Low-income Affordable Housing Applications
- Identify Underutilized Parcels
- Improved Noticing
- In-Lieu Housing Fee Recalculation
- In-Lieu Housing Fees Pooling
- Junior Accessory Dwelling Units
- Reduce Commute Hours Traffic
- Reduce Costs Of Utility Connections
- Regular Developer Meetings
- School Districts' Teacher Housing
- Specific Plans
- Stimulate Public-Private Partnerships

The Grand Jury is under no illusion that implementing these solutions will magically transform our housing affordability situation overnight. Some of these solutions may not work well in Marin. Some of these solutions require a combination of new policies and new skills. Nevertheless, we suggest that it is time to establish agreed-upon baseline metrics for housing affordability, perform tests of these solutions, re-measure these efforts against the baseline, and fine-tune the solutions to optimize results.

Implementing these solutions require public agencies and officials to change “business as usual.” Approaching tough issues (such as housing) with the question “What do we want our County to become?” (rather than “What don’t we want?”), we believe our leaders will be able to guide our citizens more comprehensively and efficiently.

## FINDINGS

- F1. Political will for the construction of new housing is constrained by County-wide vocal citizen opposition.
- F2. The costs of land and development make it too expensive to build low-income affordable housing in Marin.
- F3. Developers routinely respond that they do not try to build housing in Marin because of the difficulties imposed by the local regulatory requirements and citizen complaints.
- F4. Responsibility for housing in Marin is fragmented with little overall coordination among different agencies in the County as well as the Cities and Towns.
- F5. Active planning for the creation of low-income affordable housing does not occur within our cities, towns, and the County.
- F6. Over 60,000 people commute each day to jobs in Marin, many living outside the County.
- F7. Proposals to build low-income affordable housing create immediate neighbor opposition. Efforts to mediate with neighborhood groups are often too late in the process and have been ineffective.

## RECOMMENDATIONS

- R1. Each planning department should begin regularly scheduled meetings at which developers can speak, early in the process, with all relevant members of staff to discuss impacts of proposed development and potential solutions to problems.
- R2. Each planning department should develop a proactive community outreach strategy for any project that might be considered potentially controversial (including going beyond legal noticing minimums and initiating outreach efforts as early as possible in the development cycle).
- R3. Each planning department should use succinct “plain-speak” to convey issues in their outreach.
- R4. Each school district should investigate building teacher and staff workforce housing on their land.
- R5. Each utility district should adopt waivers for hook-up fees for low-income housing projects and accessory dwelling units.
- R6. Each jurisdiction should adopt procedures so that low-income housing projects are fast-tracked through the planning and permitting process.
- R7. The County should create and fund the position of Regional Housing Coordinator. The Coordinator's responsibilities should include: working with funding sources and developers, identifying underutilized properties, working with jurisdictions to create specific plans, and creating a County-wide Civic mediation program for all civic project community dialogues.

## REQUEST FOR RESPONSES

Pursuant to Penal Code section 933.05, the grand jury requests responses as follows:

From the following governing bodies:

- Almonte Sanitary District (R5)
- Alto Sanitary District (R5)
- Bolinas Community Public Utility District (R5)
- Bolinas-Stinson Union School District (R4)
- City of Belvedere (R1, R2, R3, R6)
- City of Larkspur (R1, R2, R3, R6)
- City of Mill Valley (R1, R2, R3, R5, R6)
- City of Novato (R1, R2, R3, R6)
- City of San Rafael (R1, R2, R3, R6)
- City of Sausalito (R1, R2, R3, R6)
- Corte Madera Sanitary District No 2 (R5)
- County of Marin (R1, R2, R3, R6, R7)
- Dixie School District (R4)
- Homestead Valley Sanitary District (R5)
- Inverness Public Utility District (R5)
- Kentfield School District (R4)
- Laguna Joint School District (R4)
- Lagunitas School District (R4)
- Larkspur-Corte Madera School District (R4)
- Las Gallinas Valley Sanitary District (R5)
- Lincoln School District (R4)
- Marin Community College District (R4)
- Marin County Office of Education (R4)
- Marin Municipal Water District (R5)
- Mill Valley School District (R4)
- Nicasio School District (R4)
- North Marin Water District (R5)
- Novato Sanitary District (R5)
- Novato Unified School District (R4)
- Reed Union School District (R4)
- Richardson Bay Sanitary District (R5)
- Ross School District (R4)
- Ross Valley School District (R4)
- San Quentin Village Sewer Maintenance District (R5)
- San Rafael City Schools (R4)
- San Rafael Sanitation District (R5)
- Sausalito - Marin City Sanitary District (R5)
- Sausalito Marin City School District (R4)
- Shoreline Unified School District (R4)
- Sewerage Agency of Southern Marin (R5)
- Stinson Beach County Water District (R5)
- Tamalpais Community Service District (R5)
- Tamalpais Union High School District (R4)
- Tiburon Sanitary District #5 (R5)

- Tomales Village Community Services District (R5)
- Town of Corte Madera (R1, R2, R3, R6)
- Town of Fairfax (R1, R2, R3, R6)
- Town of Ross (R1, R2, R3, R6)
- Town of San Anselmo (R1, R2, R3, R6)
- Town of Tiburon (R1, R2, R3)
- Union Joint School District (R4)

The governing bodies indicated above should be aware that the comment or response of the governing body must be conducted in accordance with Penal Code section 933 (c) and subject to the notice, agenda and open meeting requirements of the Brown Act.

Note: At the time this report was prepared information was available at the websites listed.

Reports issued by the Civil Grand Jury do not identify individuals interviewed. Penal Code Section 929 requires that reports of the Grand Jury not contain the name of any person or facts leading to the identity of any person who provides information to the Civil Grand Jury. The California State Legislature has stated that it intends the provisions of Penal Code Section 929 prohibiting disclosure of witness identities to encourage full candor in testimony in Grand Jury investigations by protecting the privacy and confidentiality of those who participate in any Civil Grand Jury investigation.

This report was issued by the Grand Jury with the exception of a juror who was a former elected official in a named municipality. This grand juror was excluded from all parts of the investigation, including interviews, deliberations, and the writing and approval of this report.

## GLOSSARY

**ADU:** Accessory Dwelling Unit – A new dwelling unit added entirely within an existing building or an existing authorized auxiliary structure in areas where residential use is allowed.

**Affordable Housing:** Housing subsidized by the government and available for occupancy by households that meet income thresholds specified by HUD.

**CDA:** Community Development Agency – coordinates planning, building, and environmental health departments within unincorporated areas in Marin County.

**CEQA:** California Environmental Quality Act – A statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. Enacted 1970.

**Fast-tracking:** Prioritizing and expediting the review process by a Planning Commission.

**Housing Affordability:** The measure of whether a typical household can afford to purchase or rent a typical home.

**Housing Element:** A law enacted in 1969 requiring local governments to create comprehensive long-term plans to address projected future housing needs in a community.

**HUD:** U.S. Department of Housing and Development

**In Lieu Housing Fees:** A fee paid by developers to local government in lieu of incorporating mandated affordable housing into a project. These funds are intended to be used by the government agency to support other low-income housing projects.

**JADU:** Junior Accessory Dwelling Unit

**MHA:** Marin Housing Authority – A public-private agency overseen by a governing board including private tenants and members of the Board of Supervisors to promote affordable housing in Marin.

**NIMBY:** “Not in my backyard”

**PDA:** Priority Development Area

**Plain Speak:** Using simple, direct language in place of confusing legal jargon.

**Plan Bay Area:** Contains strategies for meeting the anticipated demand for transportation, housing, and land use in local Priority Development Areas (PDAs) through 2040.

**RDA:** Redevelopment Agency – Program created in 1945 by the California Legislature to allow local governments to revitalize deteriorated areas. Over 100,000 housing units were created by RDAs before the end of the program in 2012.

**Specific Plan:** A comprehensive planning and zoning document for a defined geographic region.

## APPENDIX A: Facility Siting

The issue of where to place a civic project has been well-studied for over 40 years and referred to as “Facility Siting.” The process for siting a project can be: regulatory, market, or voluntary.<sup>61</sup> A *regulatory process* imposes a project on a community through legal actions (such as eminent domain). With a *market process*, incentives to the community are offered as conditions of project approval. A *voluntary process* involves significant community dialogue, collaboration, and negotiation.

The *MIT-Harvard Public Disputes Program* has found that the voluntary process of “mediation, when used properly, produces fairer outcomes, more efficient results, and more stable political commitments, as well as wiser use of the best scientific and technical information available.”<sup>62</sup> The well-tested *Facility Siting Credo*<sup>63</sup> details the various objectives that should be considered in a voluntary process:

- Institute a broad participatory process
- Achieve agreement that the status quo unacceptable
- Seek consensus
- Work to develop trust
- Choose the solution that best addresses the problem
- Guarantee that stringent safety measures will be met
- Fully address all negative aspects of the facility
- Make the host community better off
- Use contingent agreements
- Seek acceptable sites through a volunteer process
- Consider a competitive siting process
- Work for geographic fairness
- Set realistic timetables
- Keep multiple options open at all times

As elected officials understand, it is important to be “people-focused” (actively listening to all constituent needs) – or else they won’t be re-elected. Contractors or municipality staff members, who are responsible for achieving their milestones, tend to be much more “problem-focused.” The *Facility Siting Credo* balances both “problem-focused” and “people-focused” needs to arrive at solutions that are “win-win” instead of “win-lose.”

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<sup>61</sup> Lesbirel, S. Hayden and Shaw, Daigee. “[Facility Siting: Issues and Perspectives](#).” *Columbia Earthscape*.

<sup>62</sup> *MIT-Harvard Public Disputes Program*.

<sup>63</sup> Susskind, Lawrence. “[The Facility Siting Credo](#).” *Negotiation Journal*, Volume VI, Issue 4, October 1990, pp. 309-314

## APPENDIX B: Municipal Planning Notices

The following are recent examples of planning committee hearing notices that have been sent to nearby homeowners and business owners:

**TOWN OF TIBURON  
NOTICE OF PUBLIC MEETING  
TRESTLE GLEN CIRCLE PRECISE DEVELOPMENT PLAN**

Notice is hereby given that the Tiburon Planning Commission will hold a public meeting to consider the Trestle Glen Circle Precise Development Plan application, which depicts the creation of three (3) single-family residential lots on a 14.46-acre site. The subject property is located on the south side of Trestle Glen Boulevard between Tiburon Boulevard and the upper intersection of Juno Road. The proposed homes would be served by a private roadway leading from Trestle Glen Boulevard opposite the upper Juno Road intersection with Trestle Glen Boulevard. The property is Marin County Assessor's No. 039-061-91.

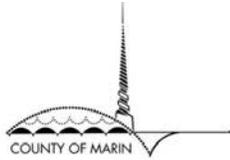
The Planning Commission will also review a Mitigated Negative Declaration for the project. The Tiburon Planning Division is recommending that a Mitigated Negative Declaration be adopted for the project pursuant to Section 21080 of the California Environmental Quality Act (CEQA). Adoption of a Mitigated Negative Declaration would indicate that all potentially significant environmental impacts of the project can be mitigated to a level of insignificance. The role of the Planning Commission is to make a recommendation to the Town Council regarding the Precise Development Plan application and to consider the Mitigated Negative Declaration in making its recommendation.

Plans and application materials for the project and the Draft Mitigated Negative Declaration & Initial Study are available for review at the Planning Division, Tiburon Town Hall, 1505 Tiburon Boulevard, Tiburon, CA 94920 and at the Belvedere-Tiburon Public Library. Inquiries regarding the Trestle Glen Circle project should be directed to Dan Watrous, Planning Manager at (415) 435-7393.

Written comments on the Draft Mitigated Negative Declaration/Initial Study will be accepted until 5:30 P.M. on **Monday, December 12, 2011**, and should be sent to Dan Watrous, Planning Manager, Town of Tiburon, 1505 Tiburon Boulevard, Tiburon, CA 94920

The Planning Commission public hearing will be held at the Town Council Chambers, 1505 Tiburon Boulevard, Tiburon, California. The Planning Commission will meet on **Wednesday, December 14, 2011. The meeting will begin at 7:30 P.M.**

## APPENDIX B: Municipal Planning Notices (cont'd)



COMMUNITY DEVELOPMENT AGENCY  
PLANNING DIVISION

### NOTICE OF MARIN COUNTY DEPUTY ZONING ADMINISTRATOR HEARING Husband Coastal Permit and Design Review Project ID P1210

NOTICE IS HEREBY GIVEN that the Marin County Deputy Zoning Administrator (DZA) will consider issuing a decision on the Husband Coastal Permit and Design Review during a public hearing scheduled on Thursday, September 15, 2016. The applicant for the project is Rebecca Husband and Tom Meyer, and the property is located at 320 Drakes View Drive, Inverness, and further identified as Assessor's Parcel 114-100-19.

The applicant requests Coastal Permit and Design Review approval to construct a new 2,270 square foot house with a detached 616 square foot carport on a wooded vacant lot in Inverness. The 2,886 square feet of proposed development would result in a floor area ratio of 3.98 percent on the 57,028 square foot lot. The proposed house would reach a maximum height of 25 feet above surrounding grade and would have the following setbacks from the exterior walls: 110 feet from the south front property line; 100 feet from the west side property line; 46 feet from the east side property line; 108 feet from the north rear property line. The proposed carport would reach a maximum height of 13 feet 3 inches above surrounding grade, and would have the following setbacks from the exterior walls: 60 feet 2 inches from the south front property line, 25 feet 10 inches from the west side property line, 132 feet 9 inches from the east side property line, and 176 feet 9 inches from the north rear property line.

For more information about the Husband Coastal Permit and Design Review, please visit the Planning Division's project webpage at: <http://www.marincounty.org/depts/cd/divisions/planning/projects>. Project plans and other documents related to the application are available on the project's webpage, where you can subscribe to receive email notifications and updates. Hard copies of all of the application materials, including project plans and any technical reports, are available at the Planning Division's public service counter, which is normally open from 8 AM until 4 PM, Mondays through Thursdays. For more information about the DZA hearing, please visit the Planning Division's DZA hearings webpage at: <http://www.marincounty.org/depts/cd/divisions/planning/boards-commissions-and-public-hearings/dza>.

The DZA hearing on the application will be held in the Marin County Hearing Chambers (Rooms 328/330, Administration Building), Civic Center, San Rafael, California, where anyone interested in this matter may appear and be heard. DZA hearings generally begin at 9:00 AM, but a more precise time will be indicated on the hearing agenda posted on the DZA hearing webpage one week before the hearing. A staff report will be available on the project webpage and the DZA hearing webpage on Friday, September 9, 2016.

The decision on this application may be appealed to the Planning Commission. If you challenge the decision on this application in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the Planning Division during or prior to the public hearing. (Government Code Section 65009(b)(2).)

August 25, 2016

Tammy Taylor  
Planner



All public meetings and events sponsored or conducted by the County of Marin are held in accessible sites. Requests for accommodations may be made by calling (415) 473-4381 (Voice) 473-3232 (TDD/TTY) or by e-mail at [disabilityaccess@marincounty.org](mailto:disabilityaccess@marincounty.org) at least four work days in advance of the event. Copies of documents are available in alternative formats, upon request.

3501 Civic Center Drive - Suite 308 - San Rafael, CA 94903-4157 - 415 473 6269 T - 415 473 7880 F - 415 473 2255 TTY - [www.marincounty.org/plan](http://www.marincounty.org/plan)

## APPENDIX B: Municipal Planning Notices (cont'd)

The following is an example of a “plain speak” formal notice:

	<b>City of Mill Valley PLANNING AND BUILDING</b>	<b>NOTICE OF PUBLIC HEARING – PLANNING COMMISSION</b> Design Review and Categorical Exemption Application ADDRESS: 156 Sycamore Ave   Project ID: PL16-4487   APN: 023-222-25
<b>MEETING DATE:</b> August 23, 2016 at 7:00PM <b>MEETING LOCATION:</b> Council Chambers, 26 Corte Madera Ave, Mill Valley, CA 94941 <b>PROJECT CONTACT:</b> Kari Svanstrom, Senior Planner, Mill Valley Planning Department (415) 388-4033   <a href="mailto:ksvanstrom@cityofmillvalley.org">ksvanstrom@cityofmillvalley.org</a>		
<b>PROJECT DESCRIPTION:</b> Address – 156 Scyamore Avenue – Design Review for a 711 square foot addition to an existing single family residence. The proposed project has been determined to be exempt from further environmental review under Section 15301(e) of the California Environmental Quality Act (CEQA) Guidelines.		
<ul style="list-style-type: none"><li>• All interested persons are welcome to attend and to comment, in person or in writing at the hearing.</li><li>• All Planning Commission meetings are webcast live and may be viewed at <a href="http://www.cityofmillvalley.org/meetings">www.cityofmillvalley.org/meetings</a></li><li>• For any questions or further information on this project, or to submit a written statement prior to the public hearing contact the project contact (listed above).</li></ul>		
<b>IF YOU CANNOT ATTEND:</b> You can comment on the project in writing, prior to the meeting via email, mail, or in person to the project contact. Project plans and other information about the project is available for public review at the public library and in the Planning Department at Mill Valley City Hall. Hours are Monday, Tuesday, and Thursday 8:00am to 12:00pm and 1:00pm to 5:00pm, and Wednesday 1:00pm to 5:00pm. Meeting agendas and staff reports can also be downloaded at the above-referenced website.		
<hr/> <p>If you challenge any subsequent action of the Planning Commission regarding this matter in court, you will be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the Planning Commission at, or prior to, the public hearing (Government Code Section 65009 (b)).</p>		
<hr/> <p><i>The City of Mill Valley does not discriminate against any individual with a disability. City publications will be made available upon request in the appropriate format to persons with a disability. If you need an accommodation to attend or participate in this meeting due to a disability, please contact the Planning and Building Department in advance of the meeting at 415 388-4033. TDD phone number is 711.</i></p>		

**APPENDIX C: Affordable Housing In-Lieu Fees**

Many communities require developers of multi-unit housing to set aside a percentage of new units as affordable housing. Instead of building affordable housing units, some of these municipalities allow the payment of fees in-lieu.

<b>Municipality</b>	<b>Has In-Lieu Fees?</b>	<b>In-Lieu Fund Account Balance (FY2016)</b>	<b>In-Lieu Fund 5-Year Expenditures</b>
Belvedere	NO	N/A	N/A
Corte Madera	YES	\$165,391	None
Fairfax	NO	N/A	N/A
Larkspur	YES	\$34,380	Marin Housing Authority for administering 39 deed-restricted units
Mill Valley	YES	\$123,895	None
Novato	YES	Cash: \$497,232 Assets: \$2,397,232	\$400,000 loan to Homeward Bound for Oma Village transitional housing (14 extremely-low-income family units)
Ross	NO	N/A	N/A
Sausalito	NO	N/A	N/A
San Anselmo	NO	N/A	N/A
San Rafael	YES	\$1,107,422	\$40,000 to Marin Housing Authority for BMR Rental Project Contract Payment; some loans to the MHA
Tiburon	YES	\$1,224,780	Homeward Bound: \$5,000 MHA: \$76,327 Legal Aide: \$47,531 Community Homeless Pgm (REST): \$12,425
County Of Marin	YES	\$5,774,727	Staff time: \$879,123 Contracts: \$94,922 Loans: \$983,000 Grants: \$375,000

**APPENDIX D: Utility Connection Fee Estimates**

To better understand costs that developers incur, the Grand Jury surveyed agencies to get an estimate of what it would cost for a service connection for: a new multi-family home (6 units) – both market rate and affordable (low-income subsidized), an accessory dwelling unit (ADU), and a junior accessory dwelling unit (JADU).

Agency	6 Market Rate Units	6 Affordable Rate Units	1 Accessory Dwell Unit	1 Jr. Accessory Dwell Unit
Almonte Sanitary District	\$24,000	\$24,000	\$1,600	\$0
Alto Sanitary District	\$25,672	\$25,672	\$4,450	\$0
Bolinas Community Public Utility District (BCPUD)	N/A <sup>64</sup>	N/A	\$0	\$0
Central Marin Sanitation Agency (CMSA)	\$33,992	Member % <sup>65</sup>	\$354	\$0
City of Mill Valley	\$30,000	\$30,000	\$0	\$0
Corte Madera Sanitary District No 2	\$46,610	\$46,610	\$7,768	\$0
Homestead Valley Sanitary District	\$7,800	\$7,800	\$1,600	\$0
Inverness Public Utility District	\$5,800	\$5,800	\$5,800	\$0
Las Gallinas Valley Sanitary District	\$34,566	\$34,566	\$5,184	\$0
Marin Municipal Water District	\$56,000	\$32,200	\$13,532	\$0
North Marin Water District	\$67,200	\$67,200	\$10,000	\$0
Novato Sanitary District	\$65,160	\$65,160	\$10,860	\$0
Richardson Bay Sanitary District	\$9,769	\$9,769	\$1,242	\$0
Ross Valley Sanitary District (RVSD)	\$68,557	\$0 <sup>66</sup>	\$11,426	\$0
San Quentin Village Sewer Maintenance District	\$38,988	\$38,988	\$6,498	\$0
San Rafael Sanitation District	\$20,566	\$20,566	\$1,424	\$0
Sausalito - Marin City Sanitary District	\$36,780	\$36,780	\$6,130	\$0
Stinson Beach County Water District	Sewer \$7,000 Water \$17,500	Negotiated	Sewer \$7,000 Water \$17,500	Sewer \$0 Water \$0
Tamalpais Community Service District	\$27,081	\$27,081	\$4,581	\$0
Tiburon Sanitary District #5	Belvedere	\$99,684	\$16,614	\$0
	Paradise Cove	\$33,072	\$5,512	\$0
	Tiburon	\$71,916	\$11,986	\$0
Tomales Village Community Services District	\$4,600	\$4,600	\$4,600	\$0

<sup>64</sup> BCPUD has moratoria in place on any new service connections to both their water system and sewer system.

<sup>65</sup> CMSA Ordinance 2013-2: "Those residential construction projects which a Member Agency designates and determines are qualified for reduced local sewer connection fees shall also automatically qualify for a reduced regional capacity charge. However, the Agency's regional capacity charge shall be reduced only by the same proportionate amount as the Member Agency's fee."

<sup>66</sup> RVSD Ordinance 64, Section 29: "On adoption of a resolution by the Board, the District may make an exemption of Connection Fees for low and moderate income or senior citizen housing that is available to the general public operated by a non-profit corporation or by a government agency."

## APPENDIX E: Marin Housing Perceptions

### Increased housing issues are being forced upon Marin County

**FACT:** All housing issues are under local government control. Established in 2008, the Sustainable Communities Act's (Senate Bill 375) goal was to target greenhouse gas (GHG) emissions from passenger vehicles. To achieve that, each of California's regional planning agencies must develop a *Sustainable Communities Strategy* that "contains land use, housing, and transportation strategies that, if implemented, would allow the region to meet its GHG emission reduction targets."<sup>67</sup> In 2013, our local regional planning agencies, Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG), jointly approved *Plan Bay Area*<sup>68</sup> to satisfy the Sustainable Communities Act. *Plan Bay Area* contains strategies for meeting the anticipated demand for transportation, housing, and land use in local *Priority Development Areas* (PDAs). Municipalities that approve PDAs are awarded with transportation grant funds and cannot be legally forced to approve the housing allocations for the PDAs.

### Marin County has insufficient resources for an increased population

#### FACTS:

- ✓ **Fire** - With improved technology and improved fire agency cooperation, fire staffing has decreased in recent years while still providing excess capacity. With more people, the 9-1-1 demands for EMS and fire will likely increase, and response times may suffer (without additional staffing).
- ✓ **Hospitals** - The long term national trend is a decreased inpatient hospital demand.<sup>69</sup> If the increased population were mostly younger and agile, then demand for inpatient services would be considerably less than an increased older population with pre-existing conditions. Both (the new) Marin General Hospital and Novato Community Hospital have excess capacity to adapt to at least a 20% increase in population.
- ✓ **Open Space** - Marin County open spaces and parks receive approximately 6 million total visitors per year. The County's active land management goals are to encourage visitation and recreation while balancing the physical infrastructure, programing and communications to ensure that both facilities and recreation have minimal impacts on ecosystems, neighbors and visitor experience.
- ✓ **Police** - Given the level of crime in Marin, adding 10-15% to the population would not likely have a major impact on the ability of the police force to suppress or investigate criminal behavior. Additional population would likely necessitate a change in staffing levels.
- ✓ **Schools** - Many Marin County public schools have demographic study updates in which consultants attempt to project future district size to plan accordingly for the future. For 2016-2017 school year, Marin County public schools have an enrollment of 38,941. Kentfield School District has a capacity of 1,560 students and a current enrollment of 1,246 (utilization factor of 79.9%). By 2020 the projected utilization factor will be 89.6%. As of 2013, Larkspur-Corte Madera School had enrollment of 1,462 students and project by 2023 an enrollment of 1,593. As of 2016, Dixie School District had 2,005 students enrolled and projected to grow to 2,089 by 2025.

<sup>67</sup> "[Sustainable Communities](#)." California Environmental Protection Agency.

<sup>68</sup> "[Plan Bay Area](#)." *Plan Bay Area 2040*.

<sup>69</sup> Evans, Melanie, "[Inpatient services fall at hospitals as ACA expands insurance](#)." *Modern Healthcare*.

## APPENDIX E: Marin Housing Perceptions (cont'd)

### Marin County has insufficient resources for an increased population (cont'd)

- ✓ **Sewers** - Central Marin Sanitation Agency (CMSA) (serving 120,000 customers in Corte Madera, Larkspur, Ross Valley, and San Rafael) has capacity to treat over 125 MGD (million gallons of water/day). Normal use is 7-12 MGD, and during storms, peak rainwater incursion temporarily has increased to 116 MGD. Additional population (with better sewer laterals) would not overflow the system. On a smaller scale for example, Sewerage Agency of Southern Marin (SASM) normally processes 2.3MGD, with peak storm processing of 30-32 MGD. SASM's total processing of 32.7MGD (with an additional 3.2MG equalization basins) would likewise not cause system overflow problems with increased population in the SASM service area.
- ✓ **Water** - Water Districts are state mandated to produce a Urban Water Management Plan every five years to confirm that water supply will be available to meet projected water demand considering the population and jobs projections of local or regional land use planning agencies. Marin Municipal Water District (MMWD) has capacity to handle over 210,000 customers (currently 189,000 customers) with an assumption of three consecutive dry years. North Marin Water District (NMWD) has 20,535 customers and has capacity to handle over 67,482 customers. Both MMWD and NMWD have plans in place for customer outreach and water conservation projects that can be expanded in an effort to extend the time when the water district may need to increase capacity or importation.

[Novato Sanitary District]

(DRAFT)

May 4, 2017

The Honorable Judge Kelly V. Simmons  
Marin County Superior Court  
P.O. Box 4988  
San Rafael, CA 94913-4988

Jay Hamilton-Roth, Foreperson  
Marin County Grand Jury  
3501 Civic Center Drive, Room #275  
San Rafael, CA 94903

Re: Response to Recommendation R5 Grand Jury Report, “Overcoming Barriers to Housing Affordability” Report dated April 6, 2017

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Novato Sanitary District (“District” or “Novato Sanitary”) as a utility providing sewer service in and about Novato, California, is required to respond to recommendation:

- R5 Each utility district should adopt waivers for hook-up fees for low-income housing projects and accessory dwelling units

**Response**

The District views Recommendation R5 to provide two separate recommendations, to wit; (1) to adopt a waiver for hook-up fees for accessory dwelling units; and (2) to adopt a waiver for hook-up fees for low-income housing projects. Viewing these as severable recommendations, the District will address them separately.

A. Pursuant to Penal Code section 933.05(b)(2), the District has not yet implemented this recommendation on Accessory Dwelling Units (or ADUs), but will implement it in a manner consistent with the terms of California Government Code section 65852.2 which is anticipated to be amended and become applicable to special districts pursuant to pending legislation (SB 229 (2017)). SB 229 is fully expected to pass and be chaptered with the applicability to special districts to be effective January 1, 2018. Also, as the Grand Jury’s Report notes, the District has implemented a waiver for these charges for Junior Accessory Dwelling Units (JADUs). The District implemented this JADU waiver in 2015.

B. Pursuant to Penal Code section 933.05(b)(4), the District does not agree to implement the recommendation to enact a waiver for “hook-up fees for low income housing.” Our reasoning is as follows: If the costs for one user segment are waived, then those waived revenues must naturally be borne by other users, essentially requiring those other users to pay for more than the

cost of their services. This is inconsistent with long standing California laws on local public agency service fees and charges.

Separately, unlike some cities and counties, the District does not have a variety of revenue sources that it can legally direct to programs or purposes other than providing sanitary type services. By comparison, cities often have revenues from various sources such as parking fees, sales tax, business licenses, concessions, along with ad valorem taxes, that they can divert towards meeting their legal responsibilities to foster low-income housing. Novato Sanitary does not have such unrestricted revenue streams.

Therefore, while the District fully appreciates the value of this recommendation, it concludes that it is not appropriate for a Sanitary District (a single purpose agency) to waive this fee when its sole function is to provide utility services based on fees and charges that cannot legally exceed the cost of providing that service.

Very truly yours,

NOVATO SANITARY DISTRICT

---

A. Gerald Peters  
President, Board of Directors

**(DRAFT)**

# NOVATO SANITARY DISTRICT BOARD AGENDA ITEM SUMMARY

<b>TITLE: Staff Report: California Water Environment Association (CWEA) Annual Conference</b>	<b>MEETING DATE: May 8, 2017</b>  <b>AGENDA ITEM NO.: 8.a.</b>
<b>RECOMMENDED ACTION(S): Receive staff report: Attendance at the California Water Environment Association (CWEA) Annual Conference, Palm Springs, April 26-29, 2017.</b>	
<b>SUMMARY AND DISCUSSION:</b>  <p>During the week of April 24, 2017, Steve Krautheim, Field Services Manager attended the CWEA Annual Conference in Palm Springs. The purpose of the Annual Conference is to provide training to all disciplines in the wastewater industry. Currently, Steve is serving his second year as the Chair of the Northern Regional Committee (NRC), which serves as a liaison committee between the CWEA Board of Directors and the Local Sections in Northern California.</p> <p>As Committee Chair, Steve has a seat on the CWEA Board of Directors. His other duties include serving as a liaison to the Monterey Bay Section, the Student &amp; Young Professionals Committee, the Operations &amp; Maintenance Committee, and he also sits on CWEA's Operations Committee.</p> <p>While at the Conference, Steve attended the Quarterly Board of Directors Meeting, the Annual Business Meeting, the Awards Luncheon as well as the committee meetings for Collections and Student &amp; Young Professionals. Steve was presented with a "P.I.C.K." Award (Professionalism, Ingenuity, Contribution &amp; Knowledge) at the Collections Committee lunch which recognizes service to CWEA and the Collections System Committee for its goal of training. Steve also served as a "Host" for several presentations on the Collection System &amp; Pump Station Maintenance tracks as well as a "Host and Facilitator" on the Silver Tsunami Track.</p>	
<b>STRATEGIC PLAN INFORMATION:</b> This item addresses Goal 1 (Operational Excellence) of the latest Strategic Plan Update.	
<b>DEPT. MGR.:</b> srk	<b>GENERAL MANAGER:</b> SSK

# NOVATO SANITARY DISTRICT BOARD AGENDA ITEM SUMMARY

<b>TITLE: Staff Report: Draft Marin County BayWAVE Sea Level Rise Vulnerability Assessment Report</b>	<b>MEETING DATE: May 8, 2017</b>  <b>AGENDA ITEM NO.: 8.b.</b>
<b>RECOMMENDED ACTION(S): Receive staff report: Draft Marin County BayWAVE Sea Level Rise Vulnerability Assessment.</b>	
<b>SUMMARY AND DISCUSSION:</b>  <p>The Marin County Department of Public Works (DPW) held a series of public meetings in April to seek input on its Bay Waterfront Adaptation &amp; Vulnerability Evaluation (BayWAVE) Draft assessment report. BayWAVE is a focused vulnerability assessment of the eastern Marin shoreline from the Golden Gate Bridge to the county line north of Novato that seeks to increase awareness and preparation for future Sea Level Rise (SLR) impacts through a coordinated, multi-jurisdictional assessment.</p> <p>The report is an informational document that catalogs impacts with six different sea level rise scenarios across the entire Marin bay shoreline. Marin already deals with flooding on a regular basis and this report's projections demonstrate the impacts across jurisdictional boundaries and along shared resources, utilities, and infrastructure.</p> <p>Early on in the process (November 2015), NSD staff was invited (and attended) a kick off meeting as members of a technical group consisting of cities, towns, water and sanitary districts, special districts, utilities, scientific and program partners, resource agencies and others to share knowledge and partake in the process. The technical group provided input on model selection and which SLR scenarios to use in the vulnerability assessment.</p> <p>Development of the Draft Report was an iterative process with members commenting on the sections that discuss their service areas. The Draft Executive Summary is attached for reference. The full Sea Level Rise Vulnerability Assessment Public Review Draft is available online at: <a href="http://www.marincounty.org/main/baywave/vulnerability-assessment">http://www.marincounty.org/main/baywave/vulnerability-assessment</a>. The 30-day comment period is through May 29, 2017.</p> <p>For informational purposes, SLR was accounted for in the District's treatment facilities upgrade projects. The original (pre-upgrade) facilities were already above then anticipated high sea levels, and further protected by a sea-wall/berm system. The sea-wall/berm system was improved in the upgrades, and can be raised in the future, if needed. Also, both from an energy efficiency perspective and sea level rise, different portions of NSD's treatment facilities were further raised by between 6-10 ft. Note that the draft BayWAVE report does have some inaccuracies regarding District facilities, especially on the protection provided by the sea-wall-berm system, and staff will work with DPW staff to correct these. District staff will be present at the Board meeting to provide an overview of the report, and be available to discuss the report or respond to any questions.</p>	
<b>ATTACHMENTS:</b> 1. Draft Executive Summary of the Marin BayWAVE Sea Level Rise Vulnerability Assessment.	
<b>STRATEGIC PLAN INFORMATION:</b> This item addresses Goal 1 (Operational Excellence) of the latest Strategic Plan Update.	
<b>DEPT. MGR.:</b> eb	<b>GENERAL MANAGER:</b> SSK

# **Marin Shoreline Sea Level Rise Vulnerability Assessment**

DRAFT

**Bay Waterfront Adaptation & Vulnerability Evaluation**  
Prepared by BVB Consulting LLC for Marin County Department of Public Works  
April 2017 | County of Marin, CA | [marinslr.org](http://marinslr.org)

# Marin Shoreline Sea Level Rise Vulnerability Assessment

Bay Waterfront Adaptation & Vulnerability Evaluation  
(BayWAVE)

With special thanks to the California State Coastal Conservancy's Climate Ready  
Grant Program

Prepared by BVB Consulting for Marin County Department of Public Works  
April 2017 | County of Marin, CA | [marinslr.org](http://marinslr.org)

*Cover Photo: Manzanita Parks & Ride, December 2, 2014. Almonte. Marin County Department of Public Works*

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## Executive Summary

Sea level in the San Francisco Bay Area has risen eight inches in the past century, and could rise up to 70 inches by the end of the century.<sup>1, 2</sup> Marin's bay shoreline is vulnerable to sea level rise and intensifying storm patterns. The third National Climate Assessment cites strong evidence that the cost of doing nothing exceeds the costs associated with adapting to sea level rise by 4 to 10 times.<sup>3</sup> Therefore, it is critical the County of Marin, incorporated jurisdictions, and special districts plan and prepare for the impacts of sea level rise to ensure a resilient county for present and future generations to ensure a resilient county for present and future generations.

The County of Marin Department of Public Works and Community Development Agency are the project leads for the Bay Waterfront Adaptation & Vulnerability Evaluation (BayWAVE) program. The program began in September 2015 with funding from County of Marin and additional financial support from the California Coastal Conservancy.

Several committees support the BayWAVE process. The Executive Steering Committee consists of County of Marin and local jurisdiction representatives. The Technical Advisory Committee includes staff from local, state, and federal agencies. Lastly, the Policy Committee includes elected officials from the participating jurisdictions. These committees serve as the beginning of the program's goals to establish an efficient shared learning process and community messaging, and create a collaborative environment for preparing for sea level

rise for all shoreline communities, and others inland, that could face the impacts of sea level rise in the coming decades. This effort may also support these communities in collaborating with and benefiting from the larger Bay Area region efforts underway.

The Vulnerability Assessment is an initial effort to identify the risks and exposure from sea level rise. Future tasks could include development of an adaptation report and may occur at different jurisdictions: local municipalities, service districts, and County of Marin could update general plans, master plans, capital improvement plans, hazard mitigation plans, and other relevant plans and procedures in the near future.

This effort is part of an ongoing scientific and public process to understand and prepare for sea level rise along the shoreline. This Vulnerability Assessment seeks to provide context and estimates of the physical and fiscal impacts across the County of Marin's bayside shoreline over the coming decades. These data highlight the complexity of the potential impacts and the need for concerted and individual actions in the face of rising tides. The data can be used to prioritize efforts, seek funding, and shape policy and development discussions that will guide the plans mentioned above.

This document presents asset profiles describing the potential consequences of a no-action, or business as usual political environment, especially for existing development. Asset profiles present potential consequences for parcels and buildings, transportation networks, utilities, working lands, natural resources, recreational assets, emergency services, and cultural resources. Vulnerable assets are also presented by jurisdiction in community profiles to enable local professionals, officials, and residents to engage in local discussions and relate to their neighbors. The following exposed and vulnerable communities have community profiles and make up the 85,840 acre study area shown in Map 1.

- Municipalities
  - Belvedere
  - Corte Madera
  - Larkspur
  - Mill Valley
  - Novato

<sup>1</sup> Sea-Level Rise for the Coasts of California, Oregon and Washington: Past, Present and Future. National Research Council (NRC), 2012.

<sup>2</sup> Rising sea levels of 1.8 meter in worst-case scenario, researchers calculate. Science Daily Online News. University of Copenhagen. Oct. 14, 2014. <http://www.sciencedaily.com/releases/2014/10/141014085902.htm> Original published in the journal Environmental Research Letters.

<sup>3</sup> Moser, S. C., M. A. Davidson, P. Kirshen, P. Mulvaney, J. F. Murley, J. E. Neumann, L. Petes, and D. Reed, 2014: Ch. 25: Coastal Zone Development and Ecosystems. *Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, p. 579-618. doi:10.7930/J0MS3QNW. <http://nca2014.globalchange.gov/report/regions/coasts>

- San Rafael
- Sausalito
- Tiburon
- Unincorporated Jurisdictions
  - Almonte
  - Bayside Acres
  - Bel Marin Keys
  - Black Point
  - California Park
  - Country Club
  - Greenbrae Boardwalk
  - Kentfield
  - Marin City
  - North Novato
  - Paradise Cay
  - Point San Pedro
  - San Quentin
  - Santa Venetia
  - St. Vincent's
  - Strawberry
  - Tamalpais Valley
  - Unincorporated Tiburon
  - Waldo Point Harbor

Each profile details key issues and geographic locations. Asset profiles include economic, environmental, equity, and management considerations related to sea level rise vulnerability. Each profile can be read independently of the others, enabling asset managers to focus on their professional area, and community members, elected officials, and others to read the analysis for a community as a whole.

### Methods

Table 1 shows the range of sea level rise projections for California adopted by the National Research Council in 2012. Given the uncertainty in the magnitude and timing of future sea level rise, this Assessment uses a scenario based approach to assess a range of potential sea level rise impacts. The scenarios selected for this Vulnerability Assessment are derived from the U.S. Geological Survey (USGS) Coastal Storm Modeling System (CoSMoS) that combines global climate and wave models with projected sea level rise to identify areas that could be flooded across 10 different sea levels (ranging from 0 to 200 inches) and 4 storm severities (none, annual, 20-, 100-year storms) to total 40 possible combinations. All of these scenarios are viewable on the [Our Coast Our Future \(OCOF\) Flood Map website](#).

Map 1. BayWAVE Study Area



Table 1. Sea Level Rise Projections for San Francisco, CA Region

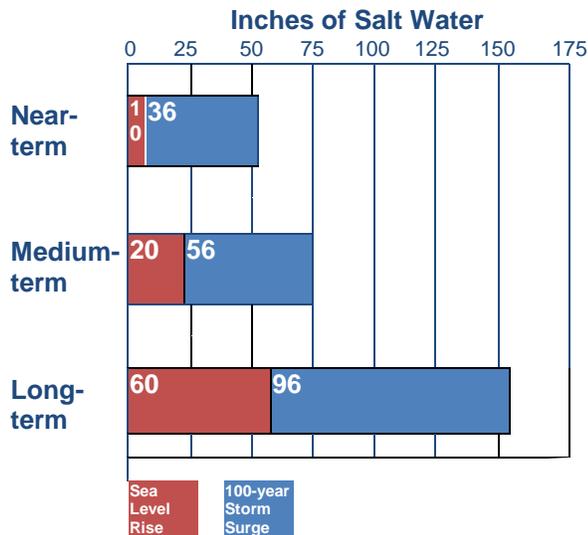
Time Period	Projected Range
by 2030	1.6 – 11.8 inches
by 2050	4.7 – 24 inches
by 2100	16.6 – 65.8 inches

Source: NRC 2012

Table 2. BayWAVE Sea Level Rise Scenarios

Scenario 1	10 inches
Scenario 2	10 inches+100-year storm surge
Scenario 3	20 inches
Scenario 4	20 inches+100-year storm surge
Scenario 5	60 inches
Scenario 6	60 inches+100-year storm surge

Figure 3. BayWAVE Scenarios Associated Water Levels



The findings of this assessment are based on three sea levels and each sea level combined with a 100-year storm surge as shown in Table 2. Scenarios 1 and 2 represent the near-term, and correspond to the 2030 NRC projected sea level range. Scenarios 3 and 4 represent the medium-term and are within the 2050 NRC range. Scenarios 5 and 6 represent the long-term and correspond to the 2100 NRC range. Figure 2 presents another view of the BayWAVE scenario where the red lengths represent tidal flooding in sea level rise scenarios 1, 3, and 5, and the blue lengths represent the addition storm surge water level associated with scenarios 2, 4, and 6. Together these bands show the cumulative potential flooding in the near-, medium-, and long-terms.

Vulnerability is based on an asset’s exposure, sensitivity, and adaptive capacity to rising bay waters and storm surge threats. If an exposed asset is moderately or highly sensitive to sea level rise impacts, with low to no adaptive capacity, the asset is considered vulnerable. Vulnerable assets may be vulnerable to flooding and/or increased rates of subsidence over the coming decades. Extensive geographic mapping was conducted overlapping layers of assets from MarinMap and sea level rise extent and flood depth layers to determine exposure. To ascertain sensitivity and adaptive capacity, the project team interviewed 115 asset managers, for example, the heads of public works departments, using the *BayWAVE Asset Vulnerability Assessment*

*Tool* to assess more than 350 built and natural resource assets. The interview results were combined with the geographic data to develop the Vulnerability Assessment.

### 15-year Expectations

Sea level rise flooding could reduce useable living space and adversely affect tourism, transportation, and natural attractions and resources within 15 years. The first threats are to buildings, roads, and original utility systems along the shoreline. Disruptive flooding to the road and utility networks could have regional ripple effects for extended periods of time. In the near-term, San Rafael and Southern Marin shoreline communities are most at risk to tidal and storm surge flooding.

In this near-term timeframe, tidal flooding at 10 inches of sea level rise (MHHW) could reach 5,000 acres, 1,300 parcels, and 700 buildings, potentially impacting tens of thousands of residents, employees, and visitors. Regular tidal flooding could adversely impact San Rafael east of US Highway 101, bayfront Belvedere and Tiburon, Greenbrae Boardwalk, Waldo Point, and Paradise Cay.

With an additional 100-year storm surge, the previously impacted acres, parcels, and buildings could face tidal and storm surge flooding. An additional 3,000 acres, 2,500 parcels, and 3,800 buildings could anticipate storm surge flooding. These figures amount to six percent of parcels and buildings in the study area. Storm surge flooding, could impact North Novato at Gness Field, Black Point on the Petaluma River, lower Santa Venetia, Belvedere around the lagoon, bayfront Corte Madera, bayfront Mill Valley, Marinship in Sausalito, Tamalpais, and Almonte, in addition to the communities vulnerable to tidal flooding.

Eight miles of road could expect tidal flooding. Many of these flooded areas already experience seasonal and king tide flooding. These are:

- Manzanita, Almonte
- Miller Avenue in Mill Valley,
- the Marinship area in Sausalito,
- US Highway 101, Corte Madera, Larkspur, and
- State Route 37 in Novato.

This is expected to worsen in severity and become increasingly frequent. Tidal flooding would reach the Canal area of San Rafael, spreading to I-580.

Several roads in Santa Venetia, Tamalpais, Belvedere, Mill Valley, Marin Lagoon of San Rafael, and bayfront Corte Madera and Larkspur would begin to experience seasonal, king tide, and storm surge flooding more frequently.

Water travel infrastructure could be compromised at ferry facilities in Larkspur, Tiburon, and Sausalito preventing commuters from traveling to work. Even if the facilities are able to handle near-term higher tides, providing safe parking and access to ferry users could prove challenging. Smaller public and private marinas and boat launches along the bay in Sausalito, Mill Valley, Strawberry, Tiburon, Belvedere, Bel Marin Keys, and Black Point could be flooded out and unusable. Storm surges can be powerful enough to damage and sink boats. This is especially a concern for residential boats.

Southern Marin Fire Protection and Sausalito Police Department boats are included in the boats harbored in marinas vulnerable to sea level rise. The Castro Fire Station in San Rafael is vulnerable to tidal flooding in the near-term and the California Highway Patrol could expect storm surge flooding in this time period. Most concerning, however, is the potential inability of emergency professionals and vehicles to access people in or through flooded areas.

In addition, the marshlands that buffer the shoreline communities from high tides and storm surges could begin to see transitions in habitat, especially those in Southern Marin where they are typically bordered by urban development. Consequently, the waters here would get deeper and flood out the existing habitat, shifting high marsh to low marsh, low marsh to mud flat, and mud flats to open water. Without adequate light of shallow water, eelgrass beds would shrink. Collectively, these habitat shifts could have significant impacts on vulnerable species such as the salt marsh harvest mouse, Ridgway's Rail, or the long-fin smelt.



Greenbrae Boardwalk. April, 2016. Credit: BVB Consulting LLC

### IMPACTS AT-A-GLANCE: SCENARIO 2

5,000 acres flooded @ MHHW	200,000+ residents plus commuting employees
8,000 acres flooded @ MHHW +100-year storm surge	2,000 agricultural acres (mostly ranch)
4,500 homes, businesses, & institutions	Property Owners County of Marin Municipalities Caltrans Sanitary Districts Water Districts Fire Districts Sausalito Police Department CHP SMART GGBHTD MTA PG&E AT&T CADFW
80 miles of wet road, 3 ferry landings, 5 marinas, 4 boat launches	
Beaches Tidal Marshes Eelgrass beds Wetlands	

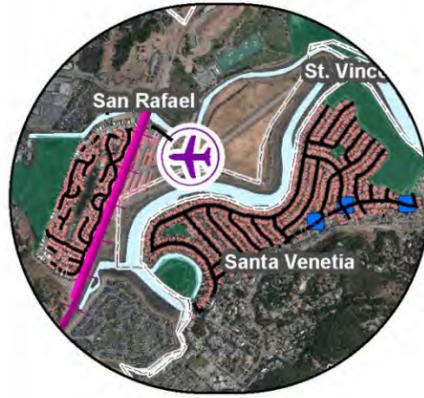
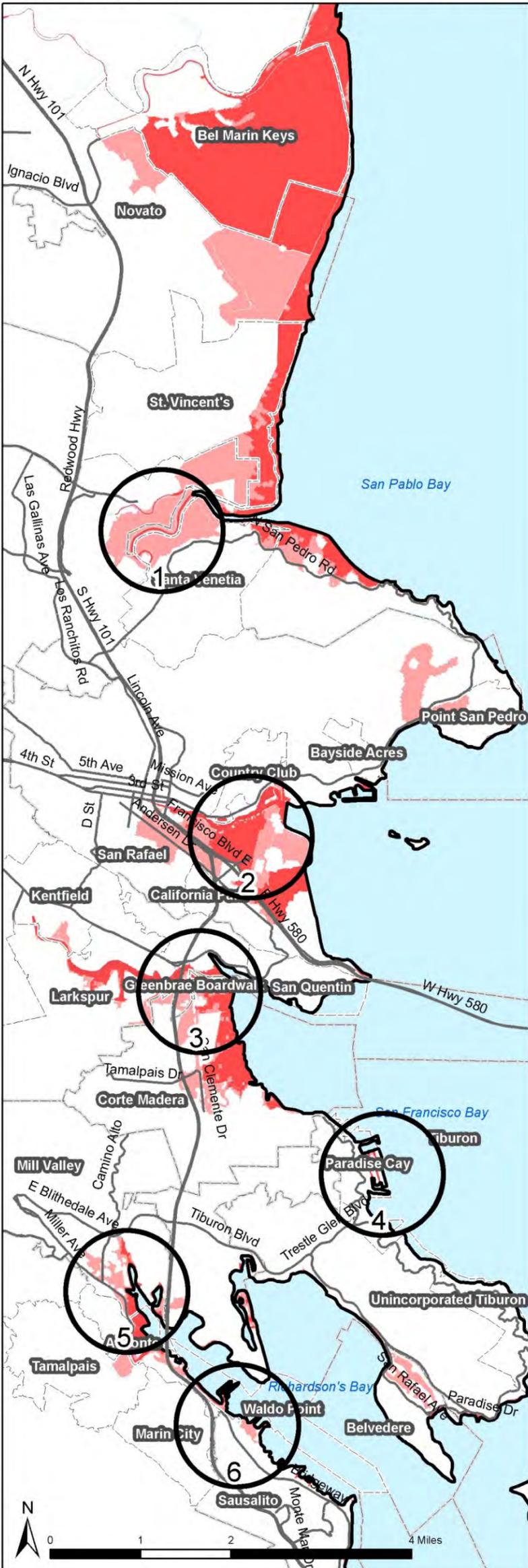
Map 131. Fifteen-year Expectation: Near-term Vulnerable Assets

# NEAR TERM

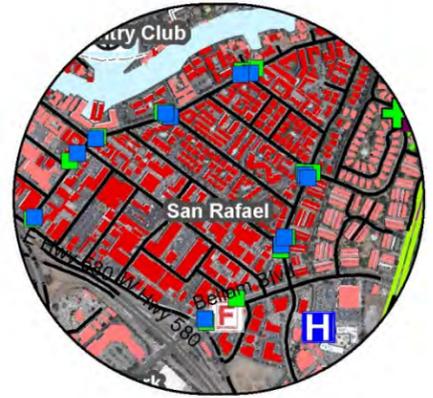
Scenario 1:  
10 in. Sea Level Rise

Scenario 2:  
10 in. Sea Level Rise  
+ 100-year storm surge

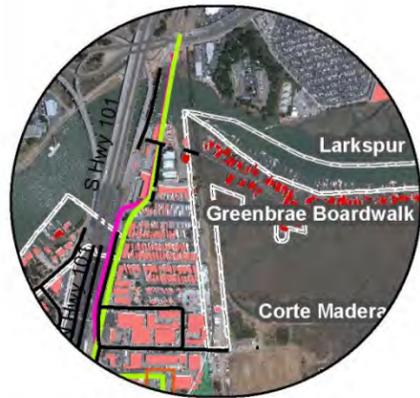
In 15 years, high tides could threaten Marin's shoreline buildings, roads, and original utility systems. Damage and breakdowns in road and utility networks would impact the entire County, especially Southern Marin. Tidal flooding (red) could reach 5,000 acres, 1,300 parcels, 700 buildings, and 8 miles of road in San Rafael east of State Route 101, bayfront Belvedere and Tiburon, Greenbrae Boardwalk, Waldo Point, and Paradise Cay. A 100-year storm surge (pink) would flood these areas with storm surge flooding, and flood an additional 3,000 acres, 2,500 parcels, 3,800 buildings, and 20 miles of road in North Novato, Black Point on the Petaluma River, lower Santa Venetia, Belvedere Lagoon, bayfront Corte Madera and Mill Valley, Marinship in Sausalito, Marin Lagoon in San Rafael, Tamalpais, and Almonte. Flooded ferry facilities would prevent commuters and visitors from traveling across the Bay. Boating facilities in Sausalito, Mill Valley, Strawberry, Tiburon, Belvedere, San Rafael, Bel Marin Keys, and Black Point may be inaccessible. This is especially a concern for marinas with residential boats and Southern Marin Fire and Sausalito Police boats. The Castro St. Fire Station in San Rafael is vulnerable to tidal flooding, though all emergency professionals would be denied vehicular access to people in vulnerable areas Southern Marin marshlands would shift high marsh to low marsh to mud flat, and eelgrass beds could shrink under deeper darker waters. These habitat shifts would have significant repercussions for plant, insect, fish, and animal species.



1: Santa Venetia



2: Canal Area



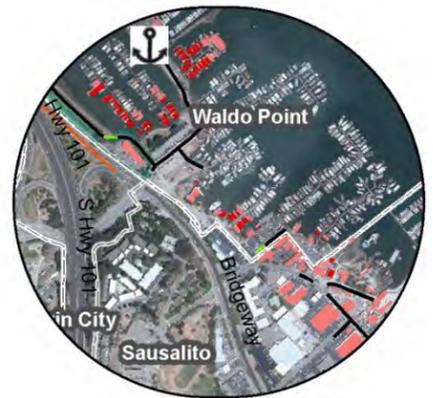
3: Greenbrae Boardwalk/  
Larkspur



4: Paradise Cay



5: Mill Valley



6: Waldo Point Harbor

**Vulnerable Assets**

**Vulnerable Buildings**

- Scen. 1: 10" Sea Level Rise (SLR)
- Scen. 2: 10" SLR+Storm Surge
- Park
- Vulnerable Road
- Marin Transit Stop
- Golden Gate Transit Stop
- ▲ Park & Ride
- SMART Track
- Ferry
- ✈ Airport
- Public Boat Launch
- Marina
- School
- H Medical Facility
- Law Enforcement
- + Emergency Shelter
- Fire Station
- ◆ District Office
- Gas Pipe
- ▲ Electrical Transmission Tower
- Substation
- PG&E Property
- Transmission Lines

**Sea Level Rise Scenarios**

- Scen 1: 10" SLR
- Scen 2: 10"SLR+Storm Surge

**Location Indicators**

- Unincorporated
- Municipality
- Road
- Bay

Disclaimer: Vulnerability Assessment maps, tables, etc. can be used as a resource to help identify potential hazardous areas and vulnerable assets. Marin County, and data providers here in, make no warranties of the accuracy or completeness of maps and data. Maps are representational and subject to future revision. Local site conditions must be examined. Commercial use is prohibited.



**IMPACTS AT-A-GLANCE: SCENARIO 4**

6,700 acres flooded @ MHHW	200,000+ residents plus commuting employees
13,500 acres flooded @ MHHW +100-year storm surge	2,000 agricultural acres (mostly ranch)
5,600 homes, businesses, & institutions	Property Owners County of Marin Municipalities Caltrans Sanitary Districts Water Districts Fire Districts Sausalito Police Department CHP SMART GGBHTD MTA PG&E AT&T CA DFW
62 miles of wet road, 3 ferry landings, 5 marinas, 4 boat launches	
Beaches Tidal Marshes Creeks Eelgrass beds Ponds Wetlands	



King tides preview future water levels. Mill Valley. 10:41 a.m., Nov. 25, 2015. Credit: Light Hawk Aerial

**Mid Century Expectations**

In this medium-term timeframe, tidal flooding at 20 inches of sea level rise (MHHW) could reach nearly 7,000 acres, 3,000 parcels, and 2,000 buildings, potentially impacting even more residents, employees, and visitors than in the near-term.

Regular high tide tidal flooding could adversely impact the same locations tidally flooded in the near-term, though more severely.

With an additional 100-year storm surge, the previously impacted acres, parcels, and buildings could face tidal and storm surge flooding, and an additional 7,000 acres, 2,200 parcels, and 3,600 buildings could anticipate storm surge flooding. These figures amount to eight percent of parcels and seven percent of buildings in the study area. Most levees south of Novato are not designed to withstand this level of flooding and could be overtopped. Storm surge flooding would impact the same locations as in near-term scenario 2, 10 inches with a 100-year storm surge, and extends further inland beyond the marshy areas of Mill Valley, Strawberry, San Rafael, St. Vincent's, and North Novato.

Eighteen miles of roadway, ten more miles than in the near-term, could expect tidal flooding. Many of the impacted roads are the same as those impacted in the near-term, though much greater lengths could anticipate tidal flooding and flooding depths would increase. Storm surge flooding could reach a total of 44 additional miles of roadway. Water travel could experience similar outcomes as in the near-term, though the highest high tides and storms surges would cause even more damage than weathered twenty years earlier.

With respect to utilities, pipelines under vulnerable roads, and lateral pipes to vulnerable properties, would become squeezed between rising groundwater and the confining roadway. This could cause pipes to bend and break, and could even damage roadways. In the medium-term, impacts to the North Marin Water District service area would impact water service in Bel Marin Keys and unincorporated Novato. In fact, Bel Marin Keys already experiences seasonal saltwater contamination. Vulnerable substations, electrical transmission towers and lines, and underground natural gas pipelines along the shoreline would be compromised by flooding and subsidence. Disruptions or failures in this network could also have far reaching impacts in transportation, sanitary service, stormwater management facilities, food storage, communications, and general public safety.

This twenty inch increase in sea level would continue to shrink Southern Marin marsh and tidal habitats would continue to shrink, as would habitats along Point San Pedro and the Tiburon Peninsula.

Complimentary recreational trails, parks, athletic facilities would experience reductions in capacity with increases in maintainance costs.



Mill Valley-Sausalito Path. Credit: J. Poskazner



Historic Flood on US Highway 101 and fronting marshes. Larkspur. Credit: Marin DPW

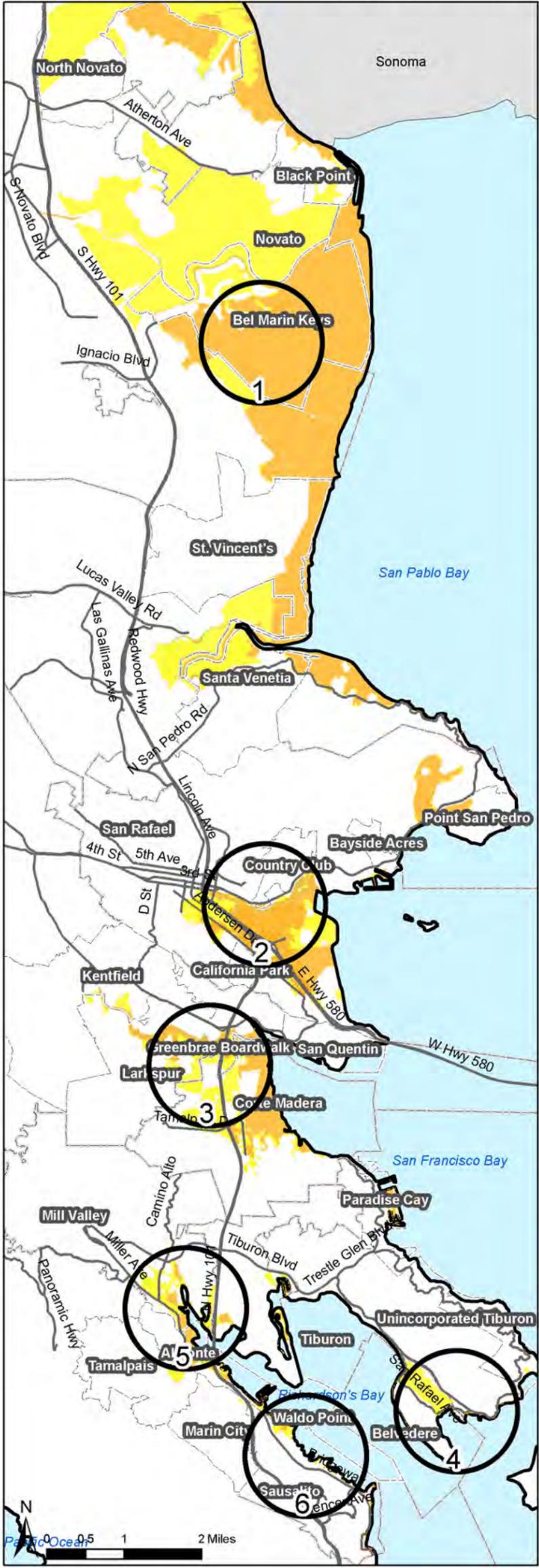
Map 132. Mid-century Expectation: Medium-term Vulnerable Assets

# MEDIUM TERM

Scenario 3:  
20 in. Sea Level Rise

Scenario 4:  
20 in. Sea Level Rise  
+ 100-year storm surge

Tidal flooding could reach 7,000 acres, 3,000 parcels, 2,000 buildings, and 18 miles of roadway in the same locations impacted in the near-term, though more severely. With a 100-year storm surge, the area vulnerable to tidal flooding would also experience storm surge flooding. An additional 7,000 acres, 2,200 parcels (8%), 3,600 buildings (7%), and 40 miles of roadway could anticipate storm surge flooding. Most levees south of Novato are not designed to withstand this level of flooding and would be overtopped. Storm surge flooding would extend further inland beyond the marshy areas of Mill Valley, Strawberry, San Rafael, St. Vincent's, and North Novato. Water travel could experience similar outcomes as in the near-term, though the highest high tides and storms surges would cause even more damage than weathered twenty years earlier. Pipelines beneath flooded roads could become squeezed between rising groundwater and the roadway, cause pipes to bend and break, and even damage roadways, this is true for sanitary, stormwater, and potable water pipes. PG&E substations, electrical transmission towers and lines, and natural gas pipelines could be bent or broken by flooding, subsidence, and erosion, with far reaching impacts on utilities, buildings, and transportation. This ten inch increase in sea level would continue to shrink trapped beach and marsh habitats in Southern Marin. Shoreline parks and pathways would flood often.



1: Southern Bel Marin Keys



2: U.S. Hwy. 101 @ Interstate 580



3: Riviera Circle



4: Tiburon/Belvedere



5: Mill Valley



6: Marinship

**Vulnerable Assets**

- Scen. 3: 20" Sea Level Rise
- Buildings Vulnerable to Storm Surge
- @20"+Storm Surge
- Park
- SMART Track
- Marin Transit Stop
- Golden Gate Transit Stop
- Park & Ride
- Ferry
- Airport
- Boat Launch
- Marina
- School
- Medical Facility
- Law Enforcement
- Emergency Shelter
- Fire Station
- District Office
- Gas Pipe
- Electrical Transmission Tower
- Substation
- Transmission Lines

**Sea Level Rise (SLR) Scenarios**

- Scen 3: 20" SLR
- Scen 4: 20"SLR+Storm Surge

**Location Indicators**

- Unincorporated
- Municipality
- Road
- Bay

Disclaimer: Vulnerability Assessment maps, tables, etc. can be used as a resource to help identify potential hazardous areas and vulnerable assets. Marin County, and data providers here in, make no warranties of the accuracy or completeness of maps and data. Maps are representational and subject to future revision. Local site conditions must be examined. Commercial use is prohibited.



**IMPACTS AT-A-GLANCE: SCENARIO 6**

16,300 acres flooded @ MHHW	200,000+ residents plus commuting employees
18,000 acres flooded @ MHHW +100-year storm surge	4,150 agricultural acres (mostly ranch)
12,100 homes, businesses, & institutions	<b>Property Owners</b> <b>County of Marin</b> <b>Municipalities</b> <b>Caltrans</b> <b>Sanitary Districts</b> <b>Water Districts</b> <b>Fire Districts</b> <b>Sausalito &amp; Central</b> <b>Marin Police</b> <b>Departments</b> <b>CHP</b> <b>SMART</b> <b>GGBHTD</b> <b>MTA</b> <b>PG&amp;E</b> <b>AT&amp;T</b> <b>CADFW</b>
\$15.6 billion in assessed property value <sup>4</sup>	
200 miles of wet road, 3 ferry landings, 5 marinas, 4 boat launches	
Beaches	
Tidal Marshes	
Creeks	
Eelgrass beds	
Ponds	
Wetlands	



*Kappas Marina. April 2016. Credit: Richardson's Bay Floating Homes Association.*

<sup>4</sup> 2016 dollars

**End of Century Expectations**

In this long-term timeframe, tidal flooding at 60 inches of sea level rise (MHHW) could reach nearly 7,000 acres, 8,000 parcels, and 9,000 buildings, potentially impacting hundreds of thousands of residents, employees, and visitors. These figures amount to 13 percent of parcels and 12 percent of buildings in the study area. Regular tidal flooding could adversely impact the same locations impacted in the near- and medium-terms and significant portions of what would have previously only flooded from the 100-year storm surge. The additional areas that would tidally flood at 60 inches of sea level rise are:

- Tamalpais Valley,
- Mill Valley from the Richardson's Bay shoreline up to and beyond Camino Alto between Miller and East Blithedale Avenues,
- Mill Valley and Strawberry fronting US Highway 101 between Seminary Drive and Tiburon Boulevard,
- Santa Venetia north of N. San Pedro Boulevard,
- Cove Neighborhood, Tiburon,
- Belvedere Lagoon neighborhood,
- Paradise Cay
- Mariner Cove, Marina Village, Madera Gardens, and major retail centers lining US Highway 101,
- Riviera Circle, Creekside, and Heatherwood neighborhoods, Larkspur,
- Interstate 580 and westward towards Andersen Drive in San Rafael and the community of California Park,
- Marin Lagoon and Peacock Gap neighborhoods, San Rafael,
- Bel Marin Keys northern and southern lagoon areas,
- Hamilton, Vintage Oaks, and pockets of development east of US Highway 101 at Rowland Boulevard and State Route 37 in Novato, and,
- North Novato at US Highway 101 and Binford Road.

In long-term scenario 6, storm surge flooding could occur on nearly 13,500 acres hosting 12,600 parcels with 12,000 buildings, potentially impacting 200,000 residents, thousands of employees, and several million visitors. These figures amount to nearly one-fifth of parcels and more than 15 percent of the buildings in the study area. Area that could anticipate storm surge flooding are:

- Sausalito west of Bridgeway,
- Marin City neighborhood,
- Mill Valley east of East Blithedale Ave at Alto Shopping Center,
- Las Gallinas and N. San Pedro Blvd, east of US Highway 101, San Rafael,
- Bayside Acres,
- Country Club, and
- Kentfield.

Tidal and storm surge flooding could cause significant economic losses. Minor storm impacts alone could account for \$61 million<sup>5</sup> in property damages. The market value of vulnerable single-family homes could exceed \$20 billion in 2016 dollars. The assessed value, typically less than market value, for all the vulnerable parcels in the study area is \$15.5 billion.<sup>6</sup> By the end of the century, these figures could be even higher.

One-hundred miles of public and private roadways, or five percent of all road miles in the study area, could be vulnerable to tidal exposure. Roads could degrade more quickly, or if flood waters are deep enough, become impassable. Lane miles could be more than double this figure. An additional 30 miles of roadway could be vulnerable at 60 inches of sea level rise and a 100-year storm surge. Moreover, several park and rides, several hundred bus stops, and bus transit and SMART rail routes could flood. The San Rafael Transit Center, where the SMART train and nearly all local and regional buses stop, could expect tidal flooding at MHHW and storm surge flooding in the long-term. Breakdowns in the transportation network would have major impacts on the economy and daily life functions. In addition, significant safety hazards could cause injury or loss of life.

Flooding at the SASM and Novato Sanitary Wastewater Treatment Plants is a significant vulnerability that could arise, potentially disrupting hundreds of thousands of people. By this time, much of the low-lying shoreline sanitary sewer and stormwater infrastructure could be flooded out.

By the end of the century, sea level rise could have direct impacts to Tiburon Fire Station No. 1, Corte Madera Station No. 13, and Novato Atherton Avenue Fire Station. A few emergency shelters in

Southern Marin communities could be vulnerable to tidal flooding, and several more could expect storm surge flooding and may not be available when needed most. By this time, the Central Marin Police Department could have to wade through saltwater surrounding the site to reach Larkspur and Corte Madera residents in need.

Southern Marin marshes may no longer exist by the end of the century, destroying the habitat of several shoreline birds and mammals. Northern Marin marshes would become increasingly tidally influenced, with tide water reaching US Highway 101 in Bel Marin Keys and North Novato up the Petaluma River. Typically freshwater marshes west of US Highway 101, for example, Sutton Marsh, could also see damaging salinity impacts. Tidal marsh lands may increase in Northern Marin if they not prevented from migrating inland.

In the long-term scenario, approximately 1,358 acres on 30 agricultural parcels could be vulnerable to sea level rise and storm conditions. Another 3,000 acres are public agency lands near Bel Marin Keys, Hamilton Field, and the Novato Sanitary District that are leased for agricultural use. Higher high tides could push brackish conditions inland, reducing grazing, manure spreading, and cultivation area. Moreover, reduced vehicular access on State Routes 37, 101, and other major roads could disrupt product distribution.

Finally, all of these assets contain or contribute to the well-being of the region's cultural, archeological, and historic resources that constitute each community's sense of place. This is especially a concern for Sausalito, Tiburon, and Novato.



*China Camp Historic pier. December 2016 King Tide. Credit: Ron Rothbart*

<sup>5</sup> 2016 dollars

<sup>6</sup> 2016 dollars

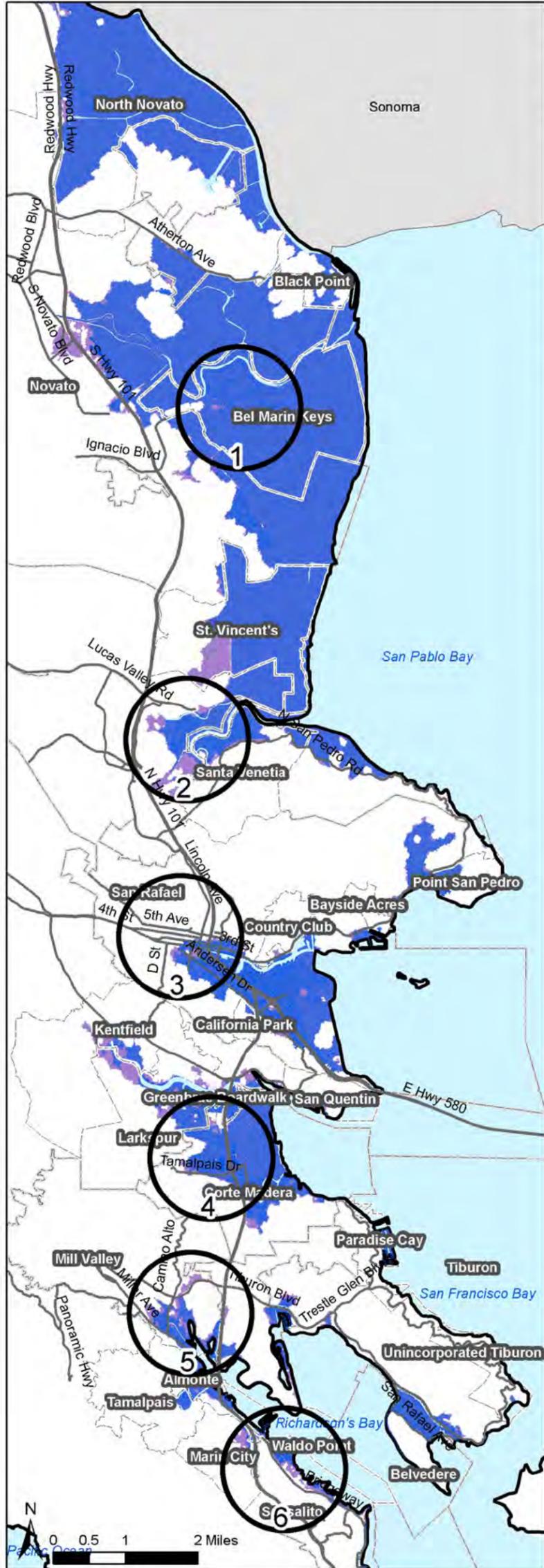
Map 133. End of Century Expectations: Long-term Vulnerable Assets

# LONG TERM

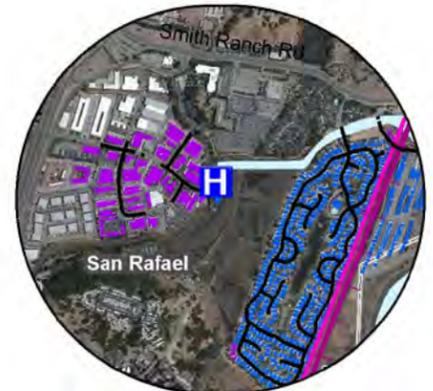
Scenario 5:  
60 in. Sea Level Rise

Scenario 6:  
60 in. Sea Level Rise  
+ 100-year storm surge

By 2100, tidal flooding could reach nearly 7,000 acres, 8,000 parcels (13%), 9,000 buildings (12%), and 100 miles of road. Higher high tides could adversely impact the locations flooded in medium-terms, and significant portions of the areas that previously suffered storm surge flooding. Tidal flooding would reach beyond the State Routes 101 and 580 in low-lying areas, into Southern Marin's narrow valleys and creek sides, and over every levee in Marin County. A 100-year storm surge could flood these areas, and an additional 6,500 acres, 4,600 parcels (20% total), 3,000 buildings (15% total), and 30 miles of road, extending to Sausalito west of Bridgeway, Marin City housing, Mill Valley's Alto Shopping Center, Las Gallinas and N. San Pedro Blvd. in San Rafael, Bayside Acres, Country Club, and Kentfield. Minor building damage could amount to \$61 million (2016 dollars). Vulnerable single family homes exceed \$20 billion in market value (2016 dollars). Several park and rides, hundreds of bus stops, and bus routes, and SMART rail track, including the San Rafael Transit Center, could experience flooding. Disruptive flooding at the SASM and NSD wastewater treatment plants and pump stations would affect tens of thousands of people. Storm surges could flood Tiburon Fire Station No. 1, Corte Madera Fire Station No. 13, and Novato Atherton Ave. Fire Station. A few emergency shelters in Southern Marin flood at high tide, and many more could be closed during a storm. The Central Marin Police Department may have to navigate deep water to reach Larkspur and Corte Madera shoreline residents. In Southern Marin, mud flats and water would dominate existing marshes. In the north, tidal marshes could expand.



1: Bel Marin Keys



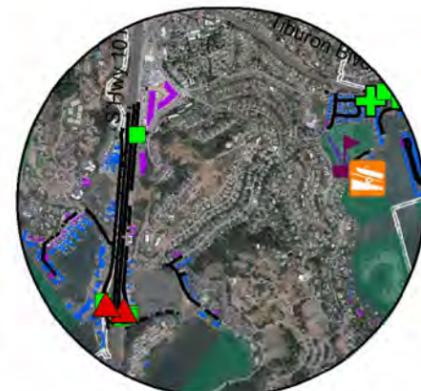
2: Marin Lagoon/Las Gallinas



3: Central San Rafael



4: Corte Madera west of U.S. Hwy. 101



5: Strawberry



6: Marin City

### Vulnerable Assets

- |                          |                    |                                |
|--------------------------|--------------------|--------------------------------|
| @60" Sea Level Rise      | SMART Station      | Sea Level Rise (SLR) Scenarios |
| @ 100-Year Storm Surge   | SMART Track        | Scen 5: 60" SLR                |
| Park                     | School             | Scen 6: 60"SLR+Storm Surge     |
| Park & Ride              | Medical Facility   | <b>Location Indicators</b>     |
| Marin Transit Stop       | Emergency Shelter  | Unincorporated                 |
| Golden Gate Transit Stop | Gas Pipe           | Municipality                   |
| Public Boat Launch       | Transmission Lines | Road                           |
|                          |                    | Bay                            |

Disclaimer: Vulnerability Assessment maps, tables, etc. can be used as a resource to help identify potential hazardous areas and vulnerable assets. Marin County, and data providers here in, make no warranties of the accuracy or completeness of maps and data. Maps are representational and subject to future revision. Local site conditions must be examined. Commercial use is prohibited.



Figure 6. Estimated Decreases in Marin County Land Area due to Sea Level Rise



A significant degree of uncertainty exists as to how soon these increases in sea level could occur because future carbon emissions are an unknown. However, even if global citizens stabilize carbon emissions, sea level rise would likely continue. Moreover, even if the growing global population reduces carbon emissions to levels where atmospheric concentrations decline, the decline will be slow and sea levels would still likely continue to rise for decades, and hundreds of years could pass before the sea level stabilizes or drops.<sup>7,8</sup> If emissions continue to increase, the rate of sea level rise is also likely to increase and these assets could be vulnerable sooner than this assessment presents. Because of this uncertainty, this assessment is the first step in an iterative process that will need to be updated as additional science becomes available and adaptation efforts are implemented. The sea level rise preparation process will require consistent monitoring and evaluation to improve modeling assumptions and ensure preparation efforts are effective and efficient.

Hamilton Wetlands and Aramburu Wildlife Preserve were recently enhanced, and wetland restoration is in planning for Bothin Marsh, McInnis Park, and Novato's baylands. Nonprofits are also working to include: Marin Audubon Society project in Corte Madera, and the Coastal Conservancy's Bel Marin Keys restoration project once funds are secured.

Combined with potential losses in West Marin due to potential sea level rise, the impacts to Marin County will be significant across all asset categories. The image to the left combines estimates for land area that would be lost at MHHW across the near-term, 2030, the medium-term, 2050, and the long-term, 2100 scenarios applied to Western and Eastern Marin.

<sup>7</sup> IPCC Fourth Assessment Report: Climate Change 2007. Climate Change 2007: Working Group I: The Physical Science Basis. 10.7.2 Climate Change Commitment to Year 3000 and Beyond to Equilibrium. [https://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/ch10s10-7-2.html](https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch10s10-7-2.html)

<sup>8</sup> IPCC Fourth Assessment Report: Climate Change 2007. Climate Change 2007: Working Group I: The Physical Science Basis. 10.7.4 Commitment to Sea Level Rise. [https://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/ch10s10-7-4.html](https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch10s10-7-4.html)



With this vulnerability assessment, Marin County professionals, officials, residents, employees, and other Bay Area communities can gain an understanding of the potential fallout from higher high tides in a no action scenario. With this comprehensive view of the potential issues, Marin County communities can approach preparing for this shared concern with greater efficiency and collaboration.



*Tiburon's Main Street buildings are from the early 1900s, and are adjacent to the ferry terminal. Credit: Marin CDA*



*Low lying properties in Black Point. Credit: Marin CDA*

## Introduction

Climate change is affecting natural and built systems around the world, including the California coast. In the past century, average global temperature has increased about 1.4°F, and average global sea level has increased 7 to 8 inches.<sup>9</sup> Sea level at the San Francisco tide gauge has risen 8 inches over the past century, and the National Research Council (NRC) projects that by 2100, sea level in California south of Cape Mendocino may rise 66 inches.<sup>10</sup> The two major causes of global sea level rise are thermal expansion of warming oceans and the melting of land-based glaciers and polar ice caps.<sup>11</sup>



View of Almonte from Shoreline Highway. Dec. 2014. Credit: Marin DPW

While Marin's shoreline already experiences regular erosion, flooding, and significant storm events, sea level rise will exacerbate these natural processes, leading to significant social, environmental, and economic impacts. The third National Climate Assessment cites strong evidence that the cost of doing nothing exceeds the costs associated with adapting to sea level rise by 4 to 10 times.<sup>12</sup> Therefore, it is critical the County of Marin, municipalities, and special districts plan and prepare for the impacts of sea level rise to ensure a resilient county for present and future generations.

This publication presents the Bay Waterfront Adaptation and Vulnerability Evaluation (BayWAVE) for Marin's San Francisco, Richardson's, and San Pablo Bay communities' built and natural assets. This effort is part of an ongoing scientific, collaborative, and public process to understand and prepare for sea level rise along the Marin shoreline. This Vulnerability Assessment seeks to provide context and estimates of the physical and fiscal impacts to shoreline over the coming decades. This analysis highlights the complexity of the potential impacts and the need for both concerted and individual actions in the face of rising tides. The data presented can be used to prioritize efforts, seek funding, and shape policy and development discussions.

The County of Marin Department of Public Works is the project lead for the Bay Waterfront Adaptation & Vulnerability Evaluation (BayWAVE) program. The program began in September 2015 with funding from County of Marin and additional financial support from the California State Coastal Conservancy. Several multi-jurisdictional committees guide the BayWAVE process. The Executive Steering Committee consists of County of Marin and local jurisdiction representatives to guide staff and provide direction at critical milestones. The Policy Committee is made up of elected officials from each city and the County of Marin. The Technical Advisory

<sup>9</sup> Heberger, M., Cooley, H., Moore, E. and Herrera, P. 2012 The Pacific Institute.. *The Impacts of Sea Level Rise on the San Francisco Bay*. California Energy Commission. Publication number: CEC-500-2012-014.

<sup>10</sup> *Sea-Level Rise for the Coasts of California, Oregon and Washington: Past, Present and Future*. National Research Council (NRC), 2012.

<sup>11</sup> Heberger, M., Cooley, H., Moore, E. and Herrera, P. 2012 The Pacific Institute.. *The Impacts of Sea Level Rise on the San Francisco Bay*. California Energy Commission. Publication number: CEC-500-2012-014.

<sup>12</sup> Moser, S. C., M. A. Davidson, P. Kirshen, P. Mulvaney, J. F. Murley, J. E. Neumann, L. Petes, and D. Reed, 2014: Ch. 25: *Coastal Zone Development and Ecosystems. Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, , 579-618. doi:10.7930/J0MS3QNW. <http://nca2014.globalchange.gov/report/regions/coasts>

Committee includes staff from local, state, and federal agencies. These committees are essential in achieving the BayWAVE goals to establish an efficient shared learning process and messaging platform, and create a collaborative environment to prepare for sea level rise. See the Acknowledgements for a complete list of committee participants.

This Vulnerability Assessment is advisory and not a regulatory document or legal standard of review for action the County of Marin, municipalities or other involved special governments may take. Such actions are subject to the applicable requirements in each jurisdiction's governing documents and applicable state and local regulations.

The County of Marin, municipalities, and special jurisdictions participating in this assessment have engaged in sea level rise planning and climate action for several years. For example, Marin's Countywide Plan (2007) addresses sea level rise in two policies: EH-3.k Anticipate Climate Change Impacts, Including Sea Level Rise and C-EH-22 Sea Level Rise and Marin's Coast. Other local efforts include sea level rise white papers for San Rafael and Novato, the Here.Now.Us project started by Marin County Supervisor Kate Sears for Southern Marin, the Department of Public Works *Richardson's Bay Shoreline Study*, Novato, Southern Marin, and Gallinas Watershed Program's demonstration projects, and the Collaboration: Sea-level Marin Adaptation Response Team (C-SMART) Program for the West Marin coastline.

This assessment follows extensive efforts throughout the nation, state, and region to understand the science of sea level rise and the impacts it could have. The San Francisco Bay Conservation and Development Commission (BCDC) established the Adapting to Rising Tides program, which includes adaptation planning guidance, and local to regional case studies, and previously published *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on the Shoreline* and *Innovative Wetland Adaptation Techniques*. Most recently, BCDC released a Levee Overtopping Study that determines the water levels required to spill over the tops of levees into the areas the aim to protect. Pacific Gas & Electric (PG&E) also released a climate change vulnerability assessment for the Bay Area. In addition, the California Energy Commission (CEC) released *Impacts of Predicted Sea-Level Rise*

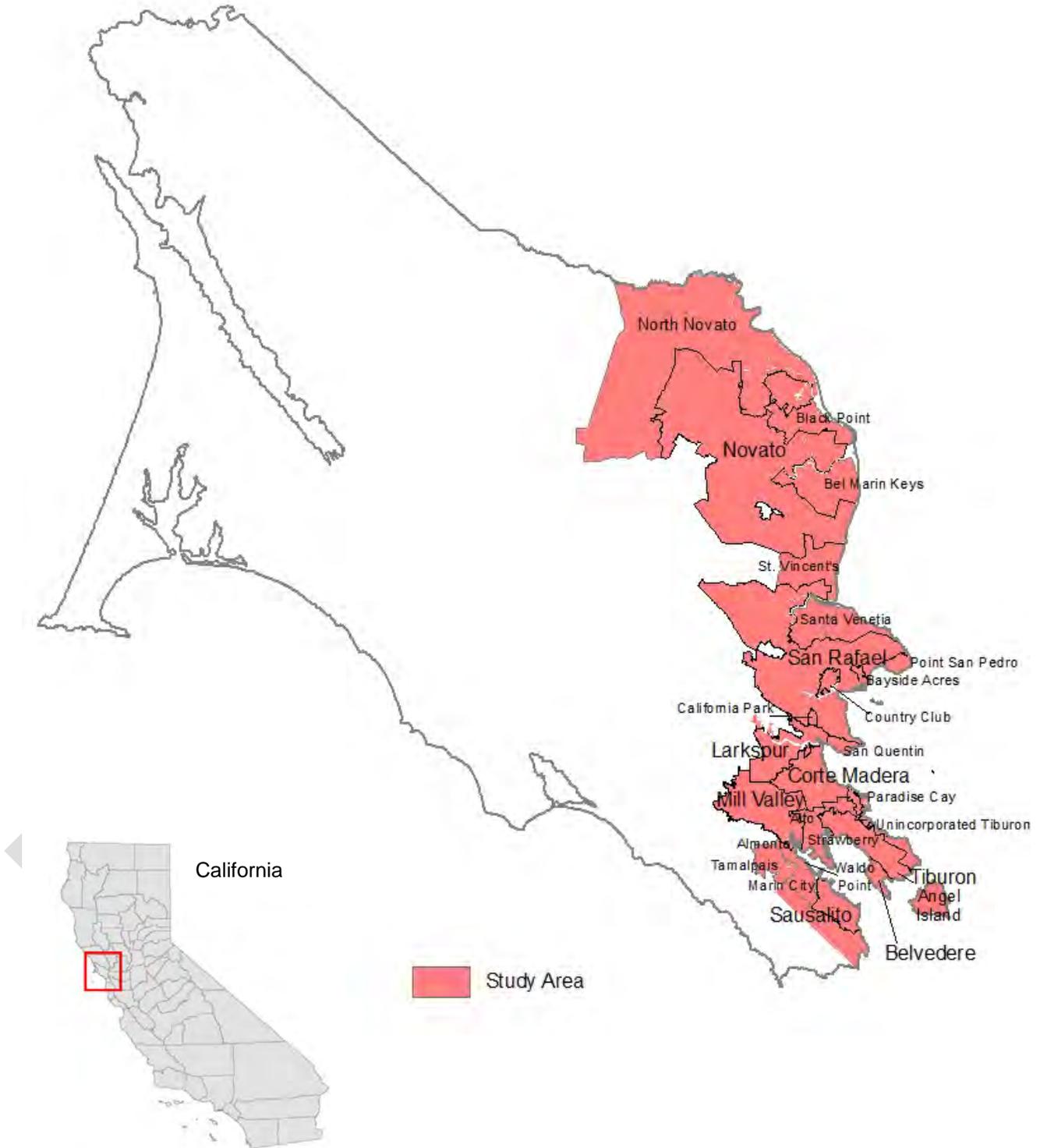
*and Extreme Storm Events on the Transportation Infrastructure in the San Francisco Bay Region*. Finally, released two years ago with special attention to climate change impacts is the Baylands Ecosystem Habitat Goals Science Update 2015.

In an effort to dovetail with these studies, goals, and regulations, this assessment applies and presents the best available sea level rise and storm surge science to Marin's shoreline to generate an understanding of Marin's potential future.

This Assessment examines lands on the Marin County bay shoreline from the Golden Gate Bridge to the Petaluma River (see [Map 1](#)). The study area is approximately 85,840 acres and comprises of the entire jurisdiction for each municipality and unincorporated community vulnerable to sea level rise under the BayWAVE scenarios. Communities exposed to sea level rise are:

- Municipalities
  - Belvedere
  - Corte Madera
  - Larkspur
  - Mill Valley
  - Novato
  - San Rafael
  - Sausalito
  - Tiburon
- Unincorporated Jurisdictions
  - Almonte
  - Bayside Acres
  - Bel Marin Keys
  - Black Point
  - California Park
  - Country Club
  - Greenbrae Boardwalk
  - Kentfield
  - Marin City
  - North Novato
  - Paradise Cay
  - Point San Pedro
  - San Quentin
  - Santa Venetia
  - St. Vincent's
  - Strawberry
  - Tamalpais Valley
  - Unincorporated Tiburon
  - Waldo Point Harbor.

Map 1. BayWAVE Study Area





*Tiburon revetment looking to Corinthian Marina and Tiburon Ferry Terminal, 2016. Credit: BVB Consulting LLC*

The locations in the study area most likely to experience sea level rise and storm surge impacts in this century are low lying areas in Marin's shoreline communities, especially east of US Highway 101. However, the dry unexposed portions of every community in the study, Tamalpais Valley, Strawberry, Da Silva Island, Mill Valley, Belvedere Island, Tiburon uplands, Sausalito, and San Rafael, could be indirectly impacted. Similarly, East Marin communities outside of the study area, such as Fairfax, San Anselmo, Ross, Alto, Lucas Valley, and others could be vulnerable to transportation network and utility impacts.<sup>13</sup> Note that while in Marin County, the Marin Headlands and Fort Baker are Federal property and not the focus of this assessment. The Federal Parks assessment is at [http://www.nature.nps.gov/geology/coastal/coastal\\_assets\\_report.cfm](http://www.nature.nps.gov/geology/coastal/coastal_assets_report.cfm).

This assessment is organized into five major sections: (1) methods, (2) asset profiles, and (3) municipality profiles (4) Unincorporated Marin, and the (5) Conclusion. The methods section details the background science and research methods used in the BayWAVE process. Asset profiles highlight the vulnerable features bayside residents, employees, and visitors depend on, such as buildings, roads, drinking water, septic, and others. The municipality profiles detail all asset vulnerabilities for each exposed municipality. The Unincorporated Marin profile also provides the same analysis for County of Marin jurisdiction. Each profile details key issues and geographic locations. Asset Profiles highlight initial

economic, environmental, equity, and management considerations related to sea level rise vulnerability. Each profile can be read independently, enabling asset managers to focus on a professional area, and community members, elected officials, and others to read about their community as a whole. The conclusion summarizes the impacts by time-period or onset of near-, medium-, and long-term impacts across all asset types and communities.

Key findings include:

- Southern Marin would likely suffer the worst flooding impacts, and could experience these impacts in the near-term.
- Increasingly compromised access to and from the Manzanita Interchange of US Highway 101 and 1 could affect hundreds of thousands of residents, employees, and visitors.
- Reductions in useable space for living, tourism, transportation, and natural resources could impact approximately 12,750 properties, more than 12,000 buildings, and 100 miles in roads.
- Based FEMA HAZUS damage estimates, waves, wind, and temporary flooding during storms could account for \$60 million to \$6 billion (2016 dollars) in building damages.
- Impacts to wastewater treatment in the Sausalito, Tamalpais, Almonte, Alto, Mill Valley, Novato, and Bel Marin Keys could affect tens of thousands of residents.
- Physical and economic impacts will be felt differently across the various income and age groups, causing social and economic inequities.
- In California, tidelands (land below the mean high water mark) and submerged lands are under public trust. As the sea level rises, thousands of private properties, if still in use, could be subject to the Public Trust Doctrine, become Waters of the State, and be required to pay a leasing fee.
- The most vulnerable habitats are shoreline beaches and marshes south of St. Vincent's.
- Areas that are not exposed to rising bay waters under the BayWAVE scenarios can still be vulnerable to sea level rise when the wastewater treatment plant, ports, and major roadways become compromised under flooding conditions.
- Marin is not self-contained and could feel impacts from across the Bay region, such as the Port of Oakland, which receives imports and exports for the entire Bay Area, or transportation network in San Francisco and the East Bay that,

<sup>13</sup> <http://cal-adapt.org/sealevel/> Cal Adapt Sea Level Rise Threatened Areas Map

when flooded, would disrupt commuting, and regional and global travel.

- Sea level rise is one of several climate change impacts residents will likely face. Combined with typical hazards that already exist (e.g. liquefaction and ground shaking near fault lines, erodible soils, and heavy rainfall), Marin is more vulnerable than this assessment can describe.

This assessment is the first step in an ongoing iterative process. The sea level rise preparation

process will require consistent monitoring and evaluation to improve modeling assumptions and ensure preparation efforts are effective and efficient. With this vulnerability assessment, Marin County professionals, officials, residents, employees, and other Bay area communities can gain an understanding of the potential fallout from higher high tides in a no action scenario. With this comprehensive view of the potential issues, Marin County communities can approach preparing for this shared concern with greater efficiency and collaboration.

### Marin Flood History

Understanding past floods can inform future vulnerabilities. Marin is no stranger to damaging floods. Major floods occurred in 1952, 1955-1958, 1967, 1969 and 1970. In later years, portions of Corte Madera, Larkspur, Greenbrae, Mill Valley, Ross, San Anselmo, San Rafael and Novato flooded in the winters of 1982/1983, 1986, 1997/1998, and 2005/2006, during El Niño events. Recent media attention has focused on the king tides that flood Southern Marin.



Ross Business District during the 1925 flood.  
Credit: Marin History Museum



Credit: Independent Journal



Credit: San Anselmo Historical Museum

**February 10<sup>th</sup> 1925** More than seven inches of rain fell in the Ross Valley, overflowing creeks, and flooding streets. Extensive damage occurred to homes and infrastructure in San Anselmo, Ross and Kentfield.<sup>14</sup>

**1956-58** Corte Madera Creek experienced major flooding that prompted a large Army Corps of Engineers flood control project. Due to continuous flooding, the Kentfield Fire Department tied a rowboat to the Laurel/Sir Francis Drake sign for use.<sup>15</sup>

**January 1982** The 'Great Storm of 1982,' dumped sixteen inches of rain that killed four residents, destroyed 35 Marin homes, and damaged 2,900 more, totaling \$80 million in damages.<sup>16, 17</sup>

### December 1969

Independent Journal



<sup>14</sup>San Anselmo Historical Museum. 2015. *San Anselmo's Long History of Flooding*. <http://sananselmohistory.org/articles/flooding/>. Accessed 1/29/16

<sup>15</sup>Source Unknown

<sup>16</sup>Blodgett J.C., and Edwin H. Chin. 1989. *Flood of January 1982 in the San Francisco Bay Area, California*.

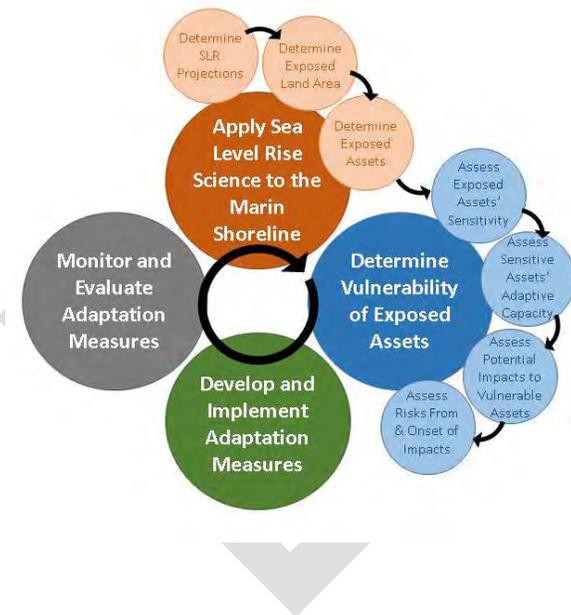
<sup>17</sup>Marin Independent Journal. 2011. *Highlights of Marin's History, from 1850-2010*

## Methodology

The BayWAVE Vulnerability Assessment process (see Figure 1) is guided by CalAdapt<sup>18</sup> through the following phases of analysis:

- Phase 1| Exposure: Assess potential changes in water level from sea level rise, storm events, and geomorphic change to determine the built and natural assets that could be exposed to saltwater.
- Phase 2| Sensitivity: Assess the degree of damage or disruption tidal and storm surge flooding could cause on the exposed assets.
- Phase 3| Adaptive Capacity: Assess each asset's adaptive capacity, or ability to respond successfully, to flooding, without human intervention
- Phase 4| Potential Impacts: Evaluate the potential consequences to the assets and larger context, assuming no intervention actions.
- Phase 5| Risk & Onset: Describe the certainty and timing of impacts.

Figure 1. BayWAVE Process



<sup>18</sup> CA Emergency Management Agency, CA Natural Resource Agency. *California Climate Adaptation Planning Guide (APG)*. July 2012. [http://resources.ca.gov/docs/climate/01APG\\_Planning\\_for\\_Adaptive\\_Communities.pdf](http://resources.ca.gov/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf)

## Modeling Methods

Sea level rise estimates used in this analysis are from the USGS Coastal Storm Modeling Systems (CoSMoS) and are viewable online through the Our Coast Our Future (OCOF) Flood Map tool. OCOF was developed through a partnership of several notable institutions and agencies, and represents the best available sea level rise and storm science.

OCOF uses the USGS's Digital Elevation Model (DEM) constructed for the region ([http://topotools.cr.usgs.gov/topobathy\\_viewer/](http://topotools.cr.usgs.gov/topobathy_viewer/)) with 2-meter horizontal grid resolution based on North American Vertical Datum of 1988 (NAVD88) elevations, and USGS's numerical modeling system called Coastal Storm Modeling System (CoSMoS) to produce a combination of 40 different sea level rise and storms scenarios. CoSMoS scales down global and regional climate and wave models to produce local hazard projections.<sup>19</sup>

High quality elevation data incorporated in the DEM was used to create maps of mean higher high water (MHHW) tidal elevation, and provides the option to add storm surges of different magnitudes. Mean higher high water is the average of the higher high water level of each tidal day observed over the National Tidal Datum Epoch.<sup>20,21</sup> Each day has two high tides, one typically higher than the other. The higher values are used for this analysis. Some days the higher high tide will be lower or higher than other days, however, several days of flooding a month, several months a year, or even once every year would be problematic depending on the resource being examined.

Note, also because the analysis uses high tide, properties near the inland extent of properties exposed to MHHW may not flood at low tides. On

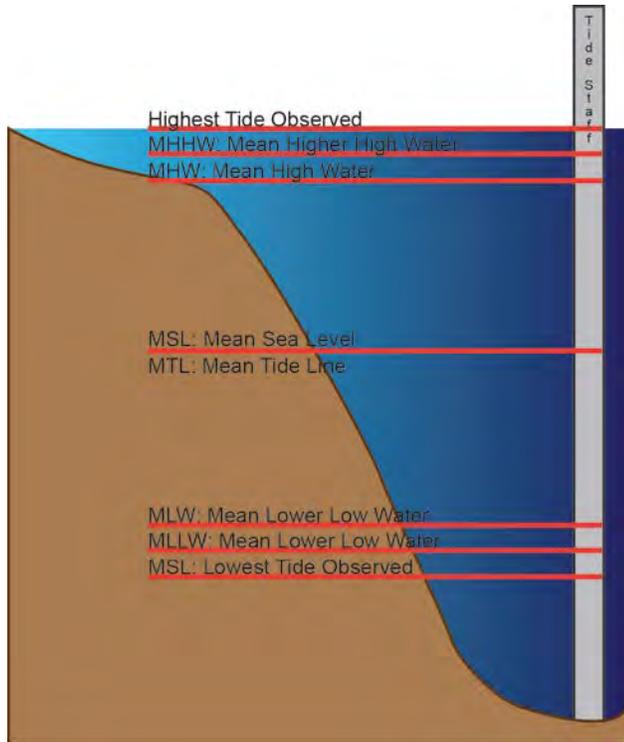
<sup>19</sup> Ballard, G., Barnard, P.L., Erikson, L., Fitzgibbon, M., Higgason, K., Psaros, M., Veloz, S., Wood, J. 2014. Our Coast Our Future (OCOF). [web application]. Petaluma, California. [www.pointblue.org/ocof](http://www.pointblue.org/ocof). (Accessed: Date August 2014).

<sup>20</sup> National Tidal Datum Epoch is the specific 19-year period adopted by the National Ocean Service as the official time segment over which tide observations are taken and reduced to obtain mean values (e.g., mean lower low water, etc.) for tidal data.

<sup>21</sup> NOAA/National Ocean Service. *Tidal Datums*. Access Oct. 19, 2015. Last updated: 10/15/2013. Center for Operational Oceanographic Products and Services. [https://tidesandcurrents.noaa.gov/datum\\_options.html](https://tidesandcurrents.noaa.gov/datum_options.html).

the other hand, these properties, and properties just beyond the inland extent of scenario 6, the most-severe scenario examined in this report, could experience flooding from the highest high tides, especially in combination with storms and/or king tides.

**Figure 2. Tidal Datum Comparing MHHW to Mean Sea Level and Low Water Levels**



Source: National Oceanic and Atmospheric Administration.  
Credit: BVB Consulting LLC



King tides preview future water levels. Mill Valley. 10:41 a.m., Nov. 25, 2015. Credit: LightHawk

CoSMoS accounts for wave run-up and set-up, storm surge of the ocean, seasonal effects, tides, levees, river discharge, and wind from the San Francisco Bay. Note that this tool only accounts for bay water levels and does not assess fresh stormwater flooding upstream or changes in the shoreline (geomorphology) as erosion continues. Thus, storms used in this analysis include bay storm surge only, not additional freshwater creek flooding upstream. In addition, this analysis does not account for the ability of pump stations to drain flooded areas.

Table 1 shows the range of sea level rise projections for California adopted by the National Research Council in 2012. Given the uncertainty in the magnitude and timing of future sea level rise, this analysis uses a scenario based approach to assess a range of potential sea level rise and storm surge exposure. The six USGS CoSMoS scenarios selected for the BayWAVE Vulnerability Assessment in Table 2 align with the NRC 2012 estimates as follows:

- Scenarios 1 and 2 represent the near-term projection anticipated by 2030.
- Scenarios 3 and 4 represent the medium-term projection anticipated by 2050.
- Scenarios 5 and 6 represent the long-term projection anticipated by 2100.

**Table 1. Sea Level Rise Projections for San Francisco, CA Region**

Time Period	Projected Range
by 2030	1.6 – 11.8 inches
by 2050	4.7 – 24 inches
by 2100	16.6 – 65.8 inches

Source: NRC 2012

**Table 2. BayWAVE Sea Level Rise & Storms Scenarios**

Sea Level Rise Scenario		Term
1	10 inches	Near
2	10 inches+100-year storm	
3	20 inches	Medium
4	20 inches+100-year storm	
5	60 inches	Long
6	60 inches+100-year storm	

Figure 3. BayWAVE Scenarios Associated Water Levels

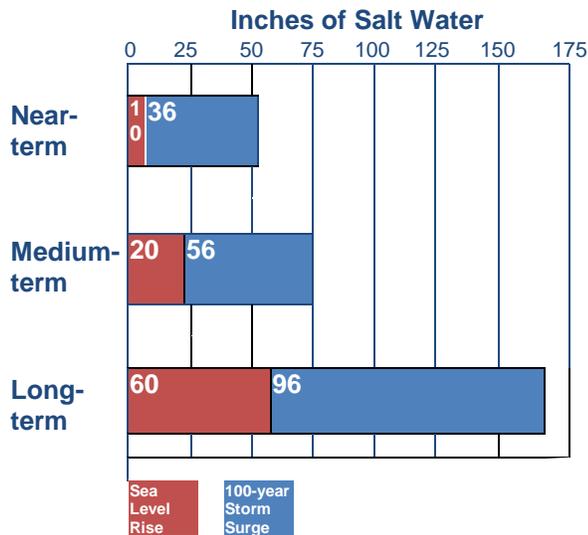


Figure 3 presents another view of the BayWAVE scenarios where the red lengths represent tidal flooding in sea level rise scenarios 1, 3, and 5, and the blue lengths represent the additional storm surge water level associated with scenarios 2, 4, and 6. Together these bands show the potential flooding in the near-, medium-, and long-terms.

The odd numbered scenarios illustrate sea level rise only. Even numbered scenarios illustrate sea levels and incorporate the storm flooding from a future based 100-year storm surge. The scenarios include storm surges because storm surges have the potential to cause catastrophic damage. The CoSMoS model uses research and predictions for future storm patterns to create the future storm typology used in the BayWAVE scenarios. Future storms are anticipated to come from a southerly direction, as opposed to historic storms, which tend to come from the north. For more information on how storms were modeled see references on the OCOF [website](#).

A 100-year storm surge has one percent chance of happening in any given year. Within a 30-year mortgage, a 100-year storm has a nearly 30 percent chance of occurring. Note that, as climate change continues, the 100-year storm surge level of flooding may occur more frequently, increasing the annual risk of this level storm occurring from a 100-year storm surge to a 50-year storm surge, for example. In addition, there are more frequent storm surges,

and less frequent storm surges such as the, 200-year, 400-year, annual, or 5-year storm surges. Less frequent larger storms would result in more severe flooding than presented in this report,<sup>22</sup> whereas, smaller storm surges would produce less severe flooding.

Maps 2 and 3, on the following pages, show the furthest inland extent of scenario 6. Maps 4 and 5 show scenarios 1, 3, and 5, and Maps 6 and 7 show scenarios 2, 4, and 6. The shoreline is typically mapped in two maps: (1) the northern study area, north of Pt. San Pedro, and (2) the southern study area, south of Pt. San Pedro, halves of the study area. The call out circle maps show zoomed in images of locations that may be difficult to see. The circles do not indicate these do not indicate that there areas are more vulnerable than areas not depicted in the circular maps.

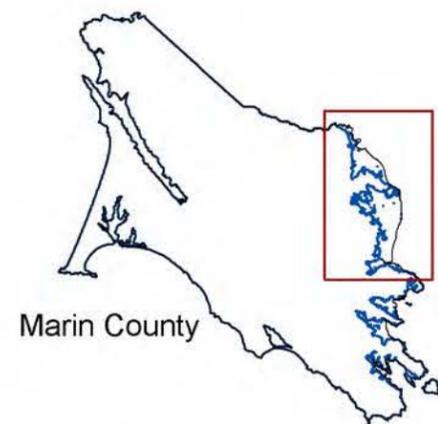
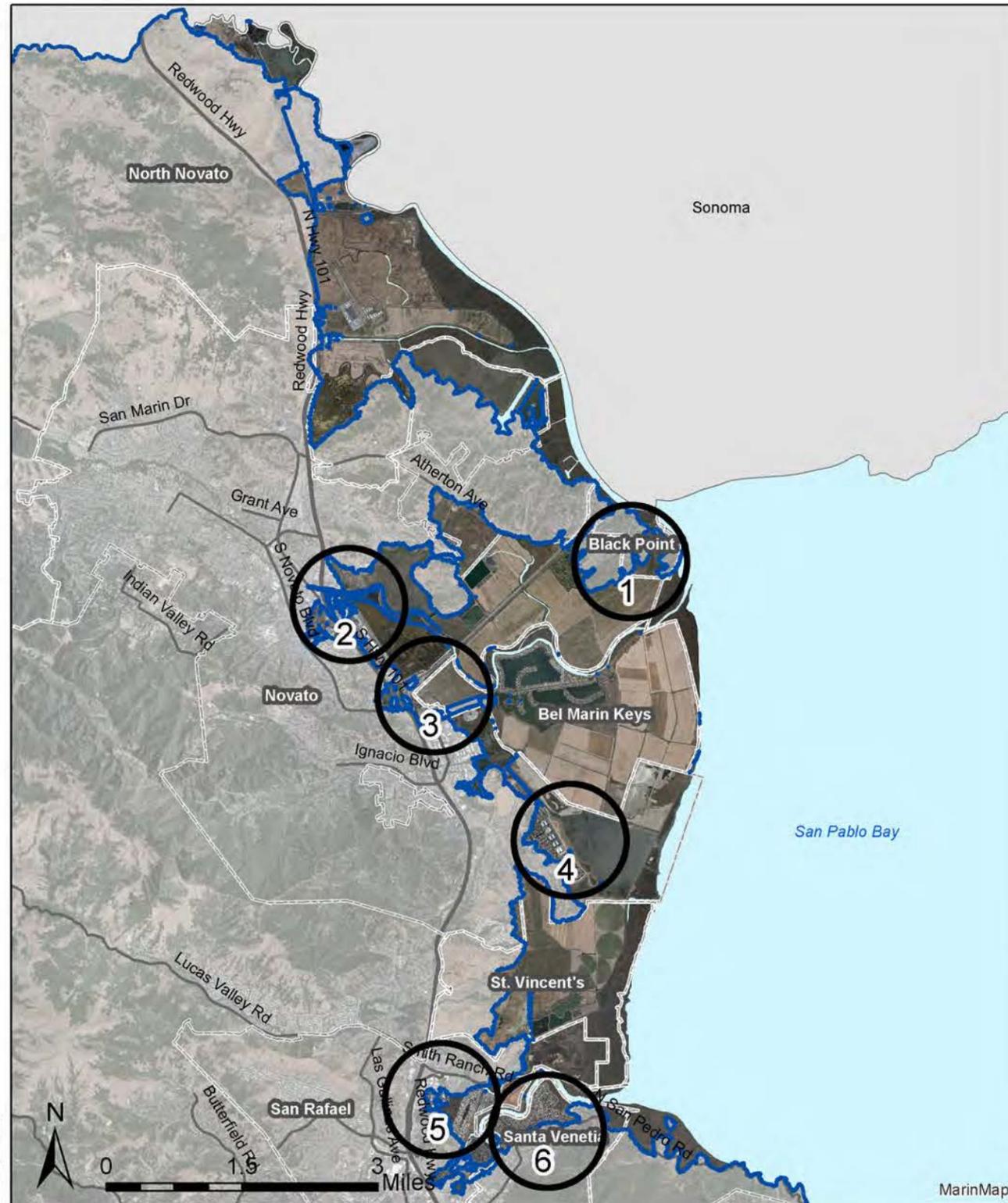
<sup>22</sup>W. Eisenstein, M. Kondolf, and J. Cain. *ReEnvisioning the Delta: Alternative Futures for the Heart of California*. Department of Landscape Architecture and Environmental Planning. University of California, Berkeley. University of California Publishing Services. IURD report # WP-2007-01. <http://landscape.ced.berkeley.edu/~delta>

Map 2. Northern Study Area Inland Extend of Scenario 6

 Inland Extend: Sea Level @ 60"+100-year Storm

**Location Indicators**

-  Unincorporated
-  Municipality
-  Road
-  Bay



Date: 4/1/2017



1: Black Point/Green Point



2: U.S. Hwy. 101 @ Rowland Blvd.



3: U.S. Hwy. 101 @ Bel Marin Keys Blvd.



4: Hamilton



5: Marin Lagoon/Marin Commons



6: Santa Venetia

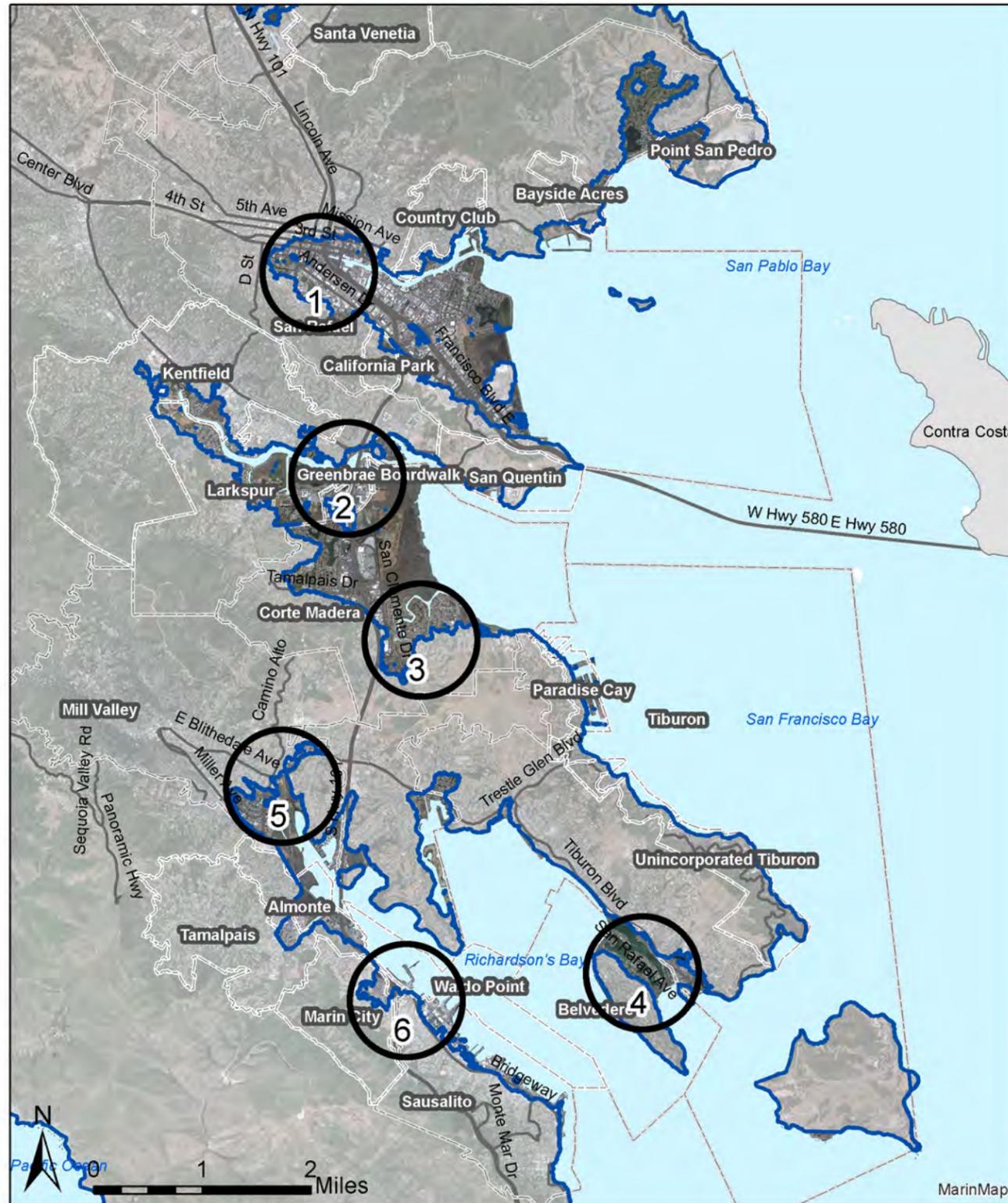
Disclaimer: Vulnerability Assessment maps, tables, etc. can be used as a resource to help identify potential hazardous areas and vulnerable assets. Marin County, and data providers here in, make no warranties of the accuracy or completeness of maps and data. Maps are representational and subject to future revision. Local site conditions must be examined. Commercial use is prohibited.

Map 3. Southern Study Area Inland Extent of Scenario 6

 Inland Extent: Sea Level @ 60"+100-year Storm

**Location Indicators**

-  Unincorporated
-  Municipality
-  Road
-  Bay



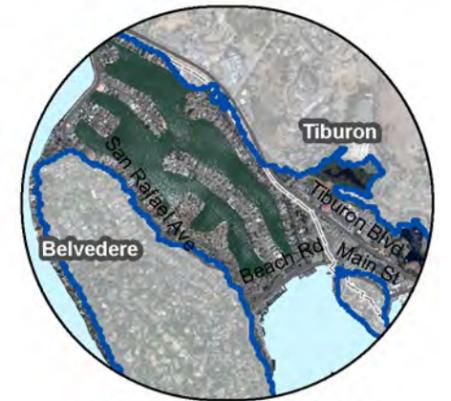
1: Downtown San Rafael



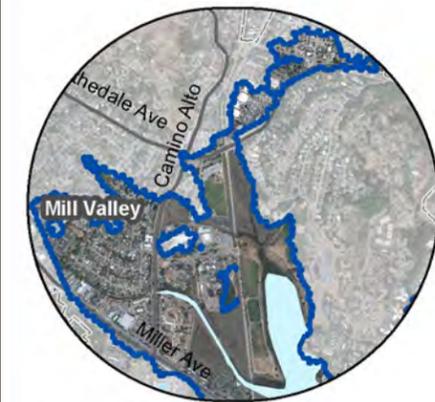
2: Greenbrae/Larkspur



3: Corte Madera



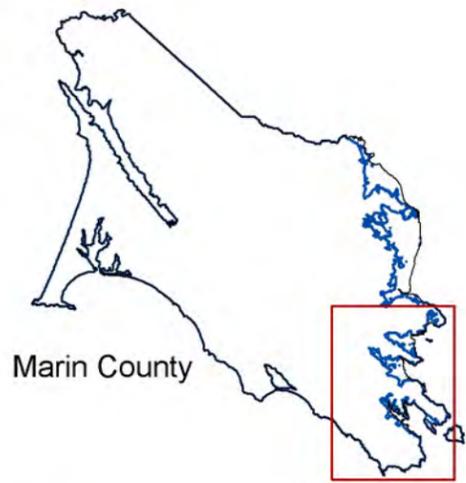
4: Belvedere/Tiburon



5: Mill Valley



6: Waldo Pt. Harbor



Date: 1/7/2017



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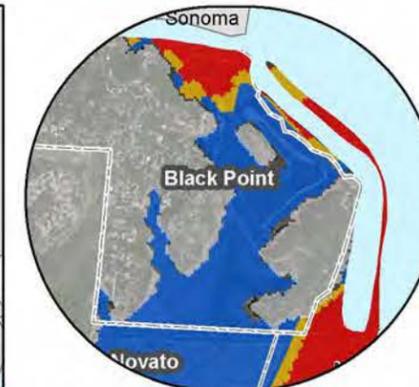
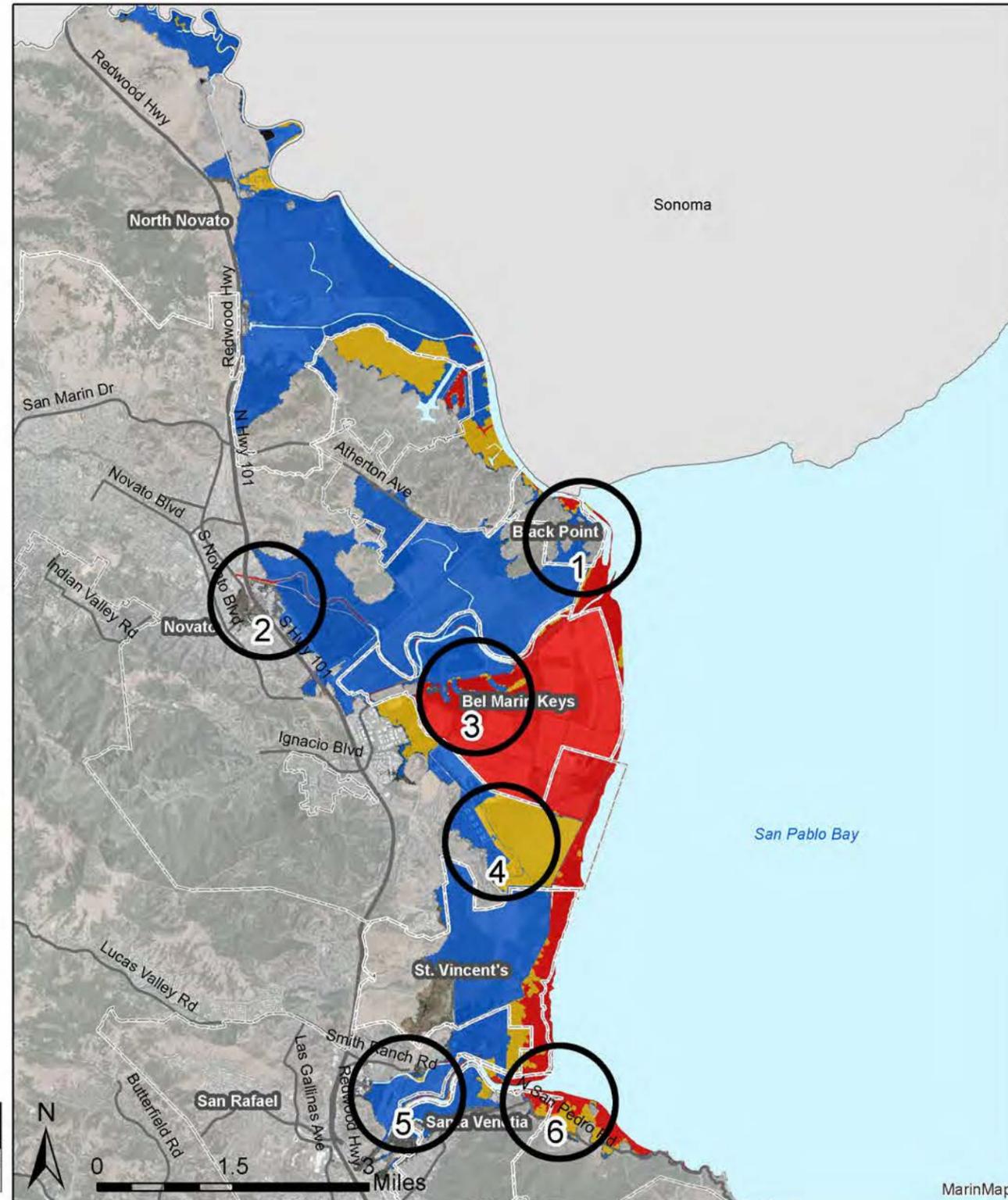
Map 4. Northern Study Area Sea Level Rise Scenarios

**BayWAVE Sea Level Rise (SLR) Scenarios**

- Scen 1: 10" SLR
- Scen 3: 20" SLR
- Scen 5: 60" SLR

**Location Indicators**

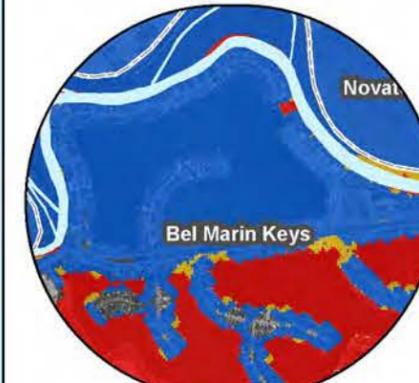
- Unincorporated
- Municipality
- Road
- Bay



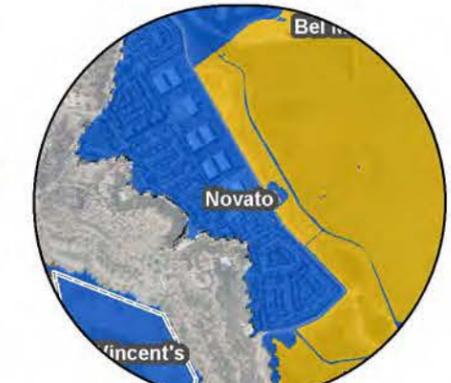
1: Black Point/Green Point



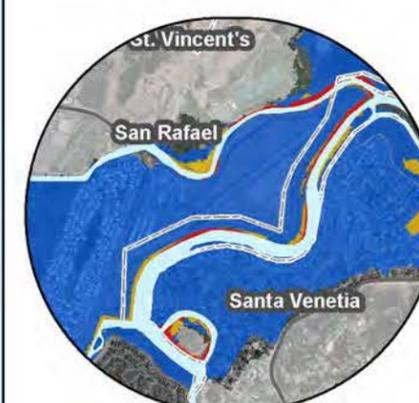
2: U.S. Hwy. 101 @ Rowland Blvd.



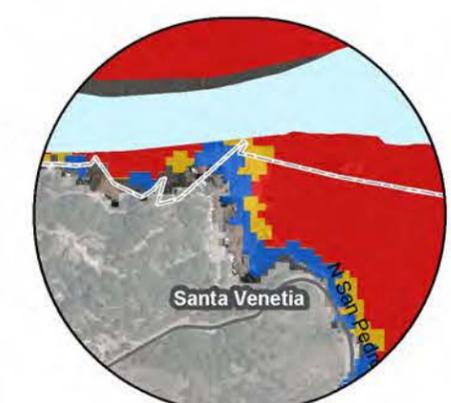
3: Bel Marin Keys



4: Hamilton

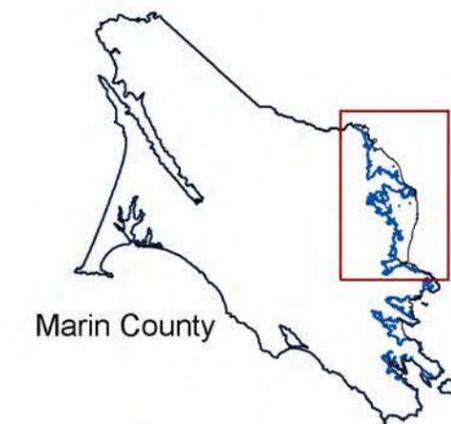


5: Santa Venetia/ Marin Lagoon



6: Buck's Landing

Disclaimer: Vulnerability Assessment maps, tables, etc. can be used as a resource to help identify potential hazardous areas and vulnerable assets. Marin County, and data providers here in, make no warranties of the accuracy or completeness of maps and data. Maps are representational and subject to future revision. Local site conditions must be examined. Commercial use is prohibited.



Date: 4/1/2017



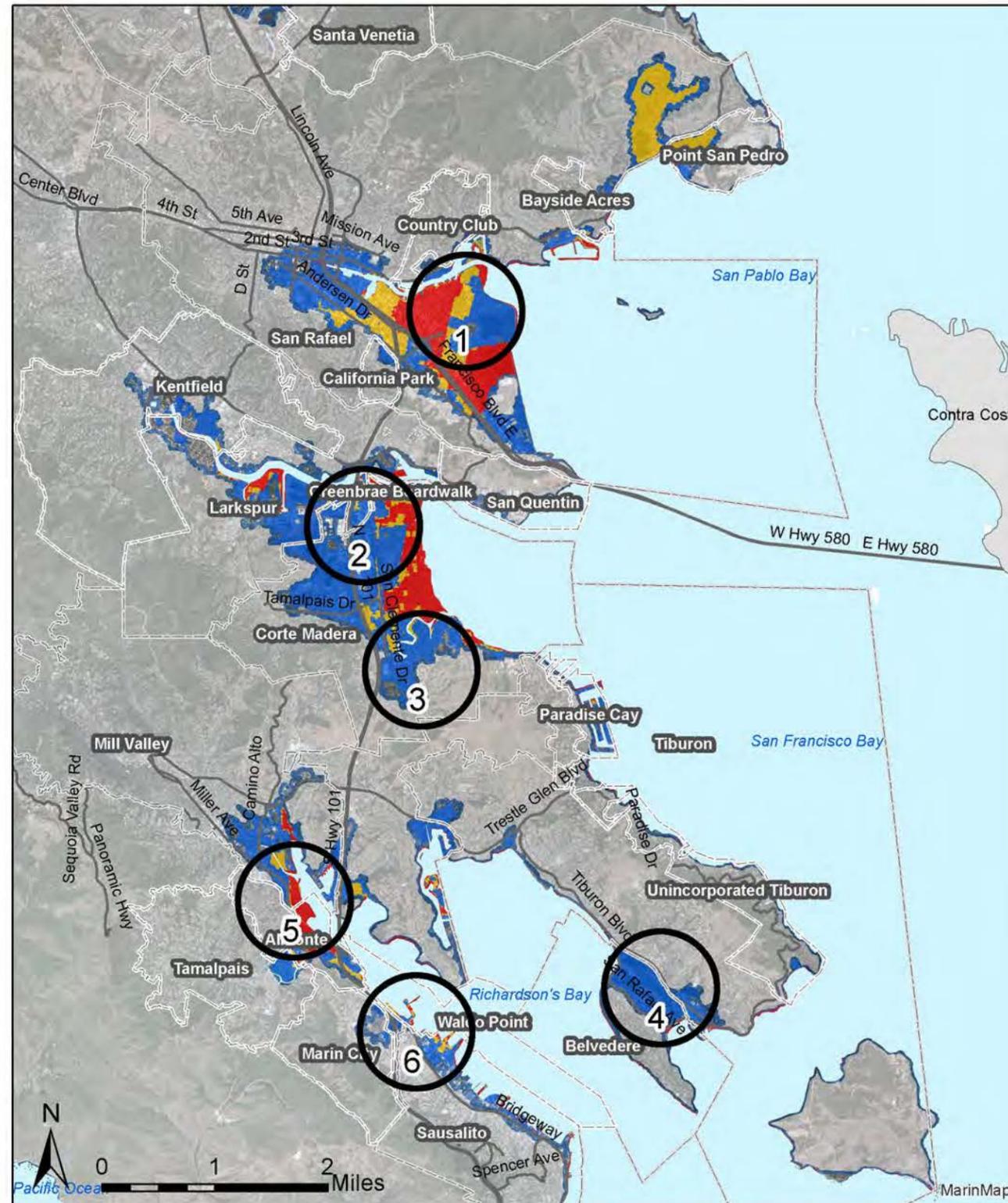
Map 5. Southern Study Area Sea Level Rise Scenarios

**BayWAVE Sea Level Rise (SLR) Scenarios**

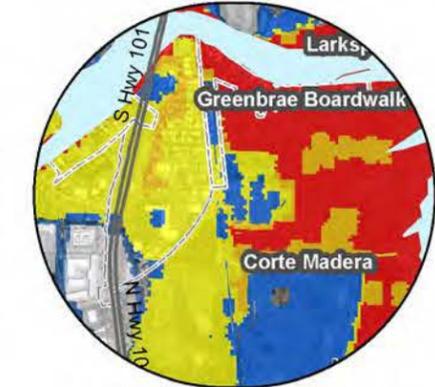
- Scen 1: 10" SLR
- Scen 3: 20" SLR
- Scen 5: 60" SLR

**Location Indicators**

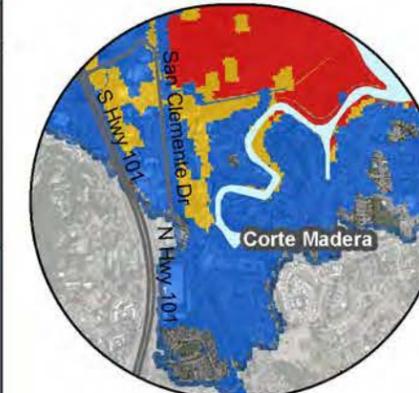
- Unincorporated
- Municipality
- Road
- Bay



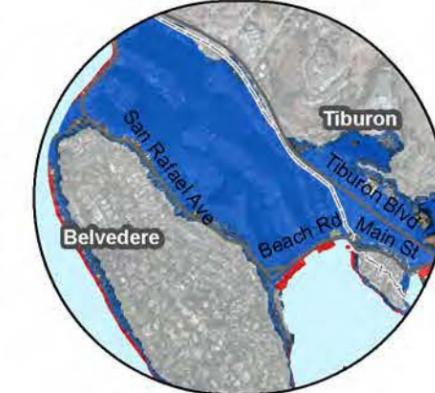
1: Canal Neighborhood



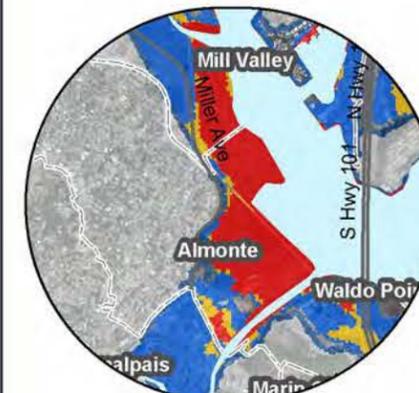
2: Greenbrae Boardwalk/  
Larkspur/Corte Madera



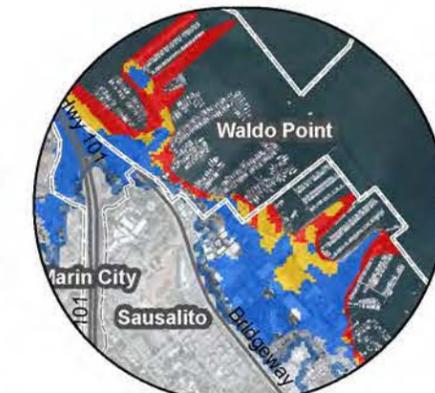
3: Corte Madera



4: Belvedere/Tiburon

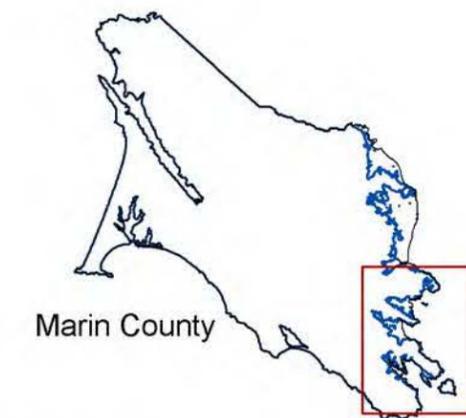


5: Almonte/Mill Valley



6: Marinship

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Date:  
1/7/2017



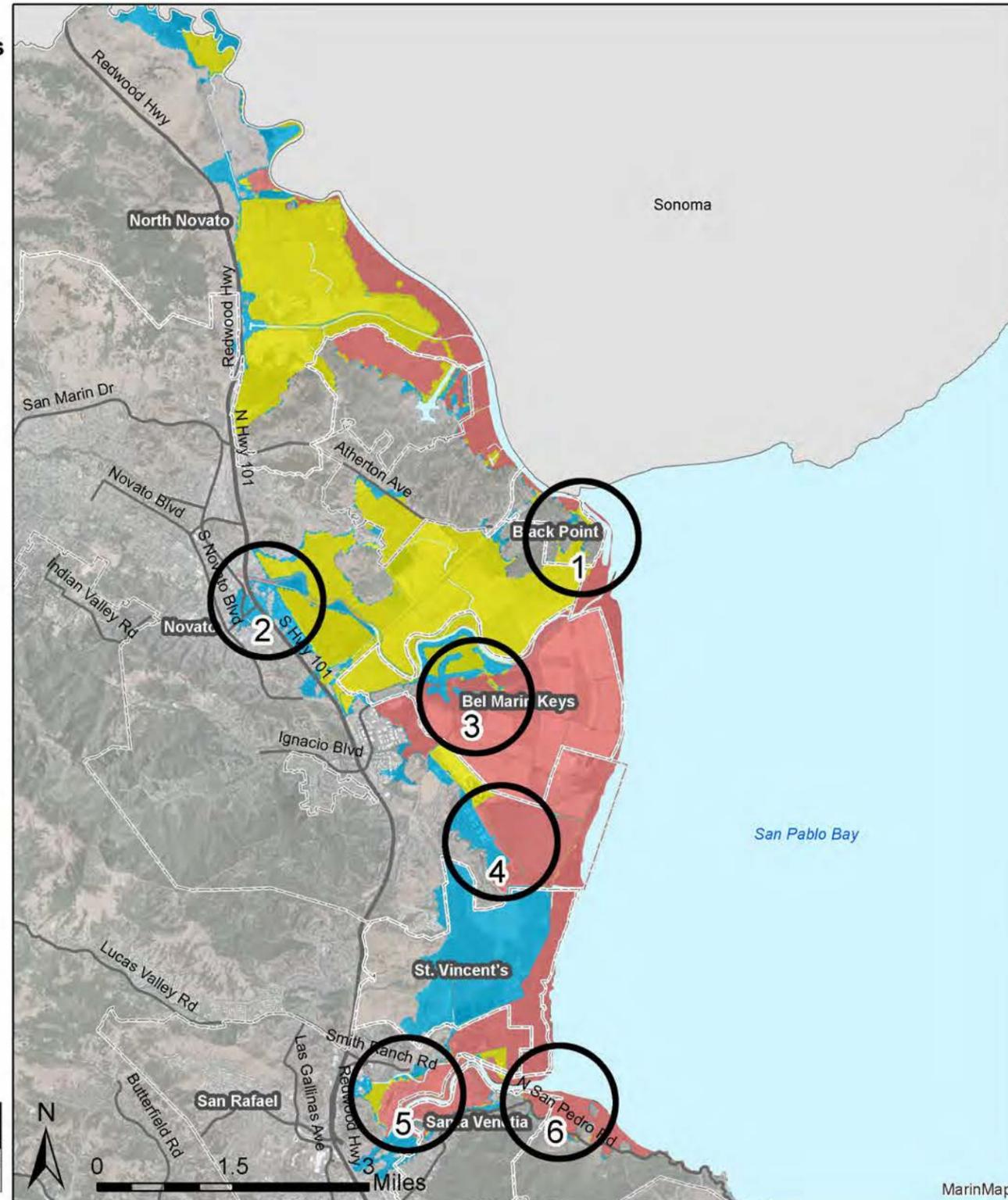
Map 6. Northern Study Area Sea Level Rise and 100-year Storm Surge Scenarios

**BayWAVE Sea Level Rise (SLR) & 100-year Storm Surge Scenarios**

- Scen 2: 10"SLR+Storm Surge
- Scen 4: 20"SLR+Storm Surge
- Scen 6: 60"SLR+Storm Surge

**Location Indicators**

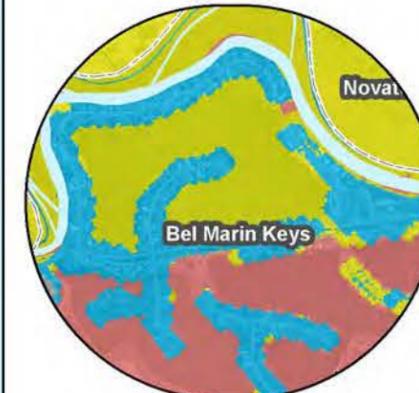
- Unincorporated
- Municipality
- Road
- Bay



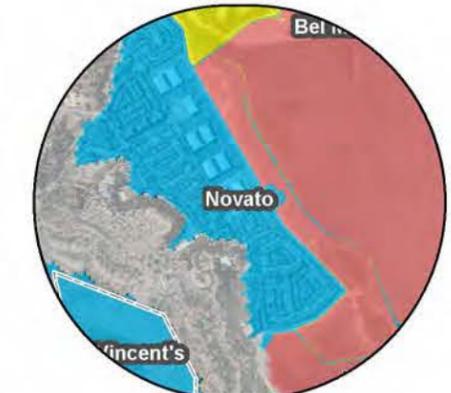
1: Black Point/Green Point



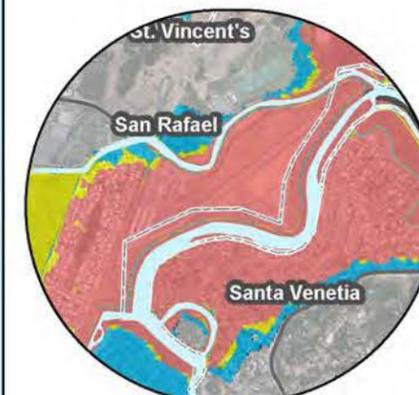
2: U.S. Hwy. 101 @ Rowland Blvd.



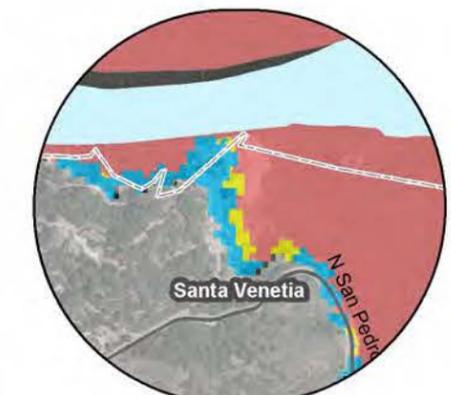
3: Bel Marin Keys



4: Hamilton

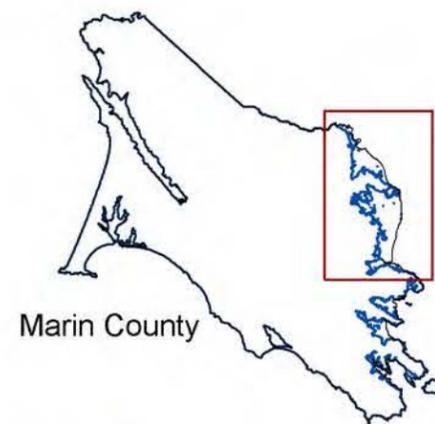


5: Santa Venetia/ Marin Lagoon



6: Buck's Landing

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Date: 4/1/2017



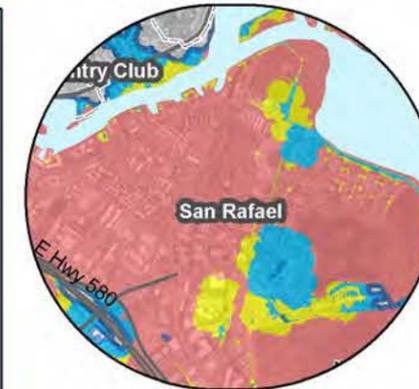
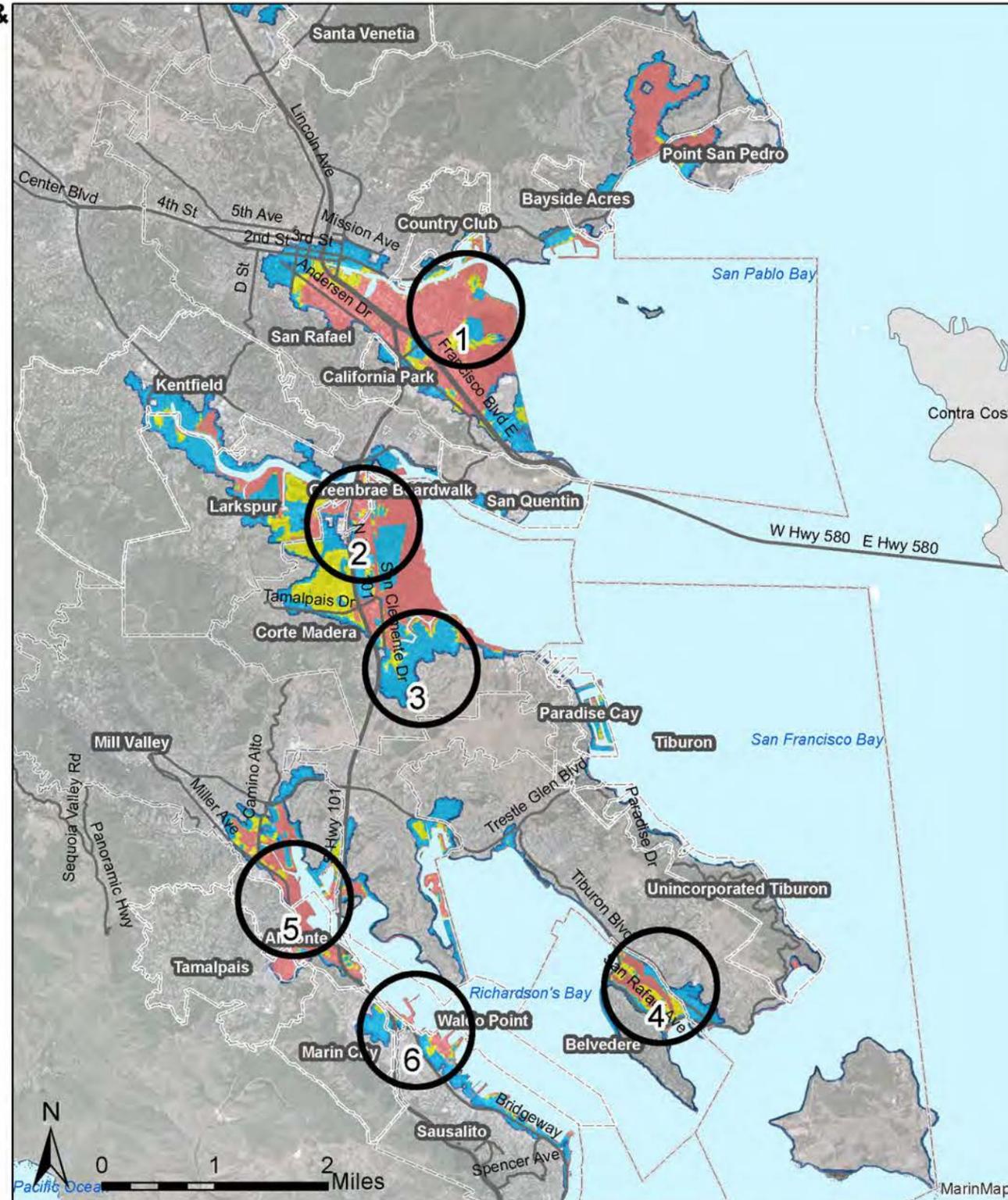
Map 7. Southern Study Area Sea Level Rise and 100-year Storm Surge Scenarios

**BayWAVE Sea Level Rise (SLR) & 100-year Storm Surge Scenarios**

- Scen 2: 10"SLR+Storm Surge
- Scen 4: 20"SLR+Storm Surge
- Scen 6: 60"SLR+Storm Surge

**Location Indicators**

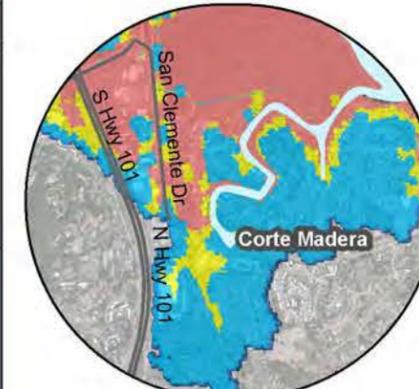
- Unincorporated
- Municipality
- Road
- Bay



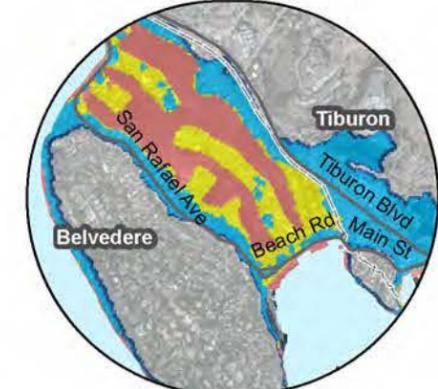
1: Canal Neighborhood



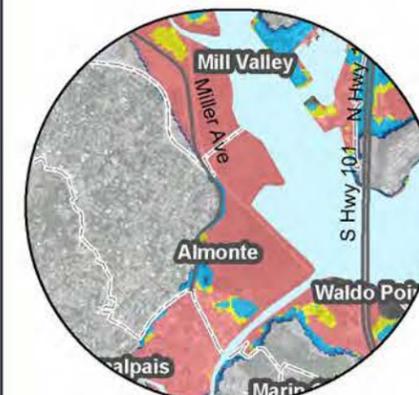
2: Greenbrae Boardwalk/  
Larkspur/Corte Madera



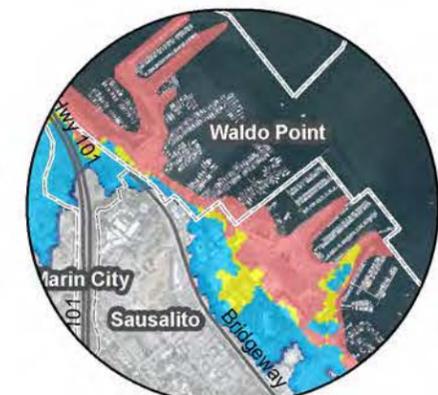
3: Corte Madera



4: Belvedere/Tiburon

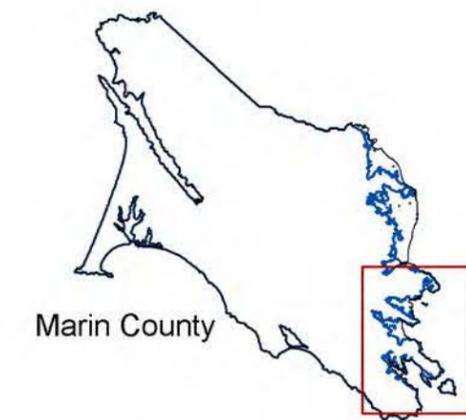


5: Almonte/Mill Valley



6: Marinship

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Date:  
1/7/2017



According to the San Francisco Bay Conservation and Development Commission's *A Sea Level Rise Strategy for the San Francisco Bay Region* noted that it is particularly difficult to develop a strategy for dealing with sea level rise when the temperature increase scenarios yield a tenfold difference between the lowest and highest potential increases in the San Francisco Bay water level over the next 100 years.<sup>23</sup>

This high degree of uncertainty, due differing assumptions in carbon emissions, in sea level rise modeling results in a range of onset predictions. Variances between the predictions increase further out in time. This uncertainty is heightened by the non-linear growth rate of sea level rise.<sup>24,25</sup> Because of this variation, the BayWAVE scenarios do not focus on years, rather a framework of near-, medium-, and long-term scenarios. The OCOF tool enables the user to view the year a sea level projection could be met across the various published sea level estimates on the [OCOF website](#).

Regardless, even if the world stabilizes carbon emissions, sea level rise will continue. Even if the global population reduces carbon emissions to levels where atmospheric concentrations decline, the decline will be slow, sea levels could continue to rise for decades, and hundreds of years could pass before sea level stabilizes or drops.<sup>26,27</sup>

## Known Issues

The USGS acknowledges local modeling issues at the Petaluma River where dense vegetation leads to a false elevation reading and thus, under-predicts the potential flooding extent. Maximum flood potential indicates more probable flooding extents in

these locations. In addition, the 100-year storm scenario flooding extents in the vicinity of Petaluma River and Novato may be under-predicted. The modeling team manually adjusted parameters to show more probable flooding behavior. Local professionals also suspect that water absorbed by the marshes at China Camp State Park may yield less flooding than the model estimates.

In addition, several sites underwent, or are currently undergoing, elevation increases after the baseline imagery was taken in 2010. Thus, the model and maps may overestimate flooding. These projects are shown on [Maps 8 and 9](#) and include:

- Waldo Point Harbor: Filled and elevated parking and entrance area.
- Rose Garden Neighborhood, Larkspur: This recently completed development was elevated to meet FEMA and County flood prevention requirements.
- Aramburu Island, Strawberry: This man-made barrier island off Harbor Point in Strawberry was improved in 2012 and offers enhanced protection from wave impacts during storms.
- Hospice and base of Call Park Hill: Recent construction may have elevated the site above 2010 elevations. This could result is less than flooding than estimated in this assessment.
- The Strand and Loch Lomond Marina, San Rafael: This project is near completion. The sites were filled with sediment and elevated to meet FEMA standards.
- Redwood Landfill: Roughly two feet in height was added to the external and internal levees after 2010.

Another issue arises with the Belvedere and Bel Marin Keys Lagoons. These lagoons are managed with tide gates that can close during high tides. The model treats these gates as open. So long as the tide gates and levees are not over topped, closing these protective devices could reduce flooding to properties on the lagoons in the near- and medium-terms.

Finally, note that the model does not take planned projects into consideration and assumes no action taken to prepare of adapt for sea level rise. Several projects along the shoreline are planned that could also help to reduce sea level rise flooding threats. These projects will be presented in the BayWAVE sea level rise early action report, the counterpart to this Assessment.

<sup>23</sup> San Francisco Bay Conservation and Development Commission. Revised September 2008. *A Sea Level Rise Strategy for the San Francisco Bay Region*

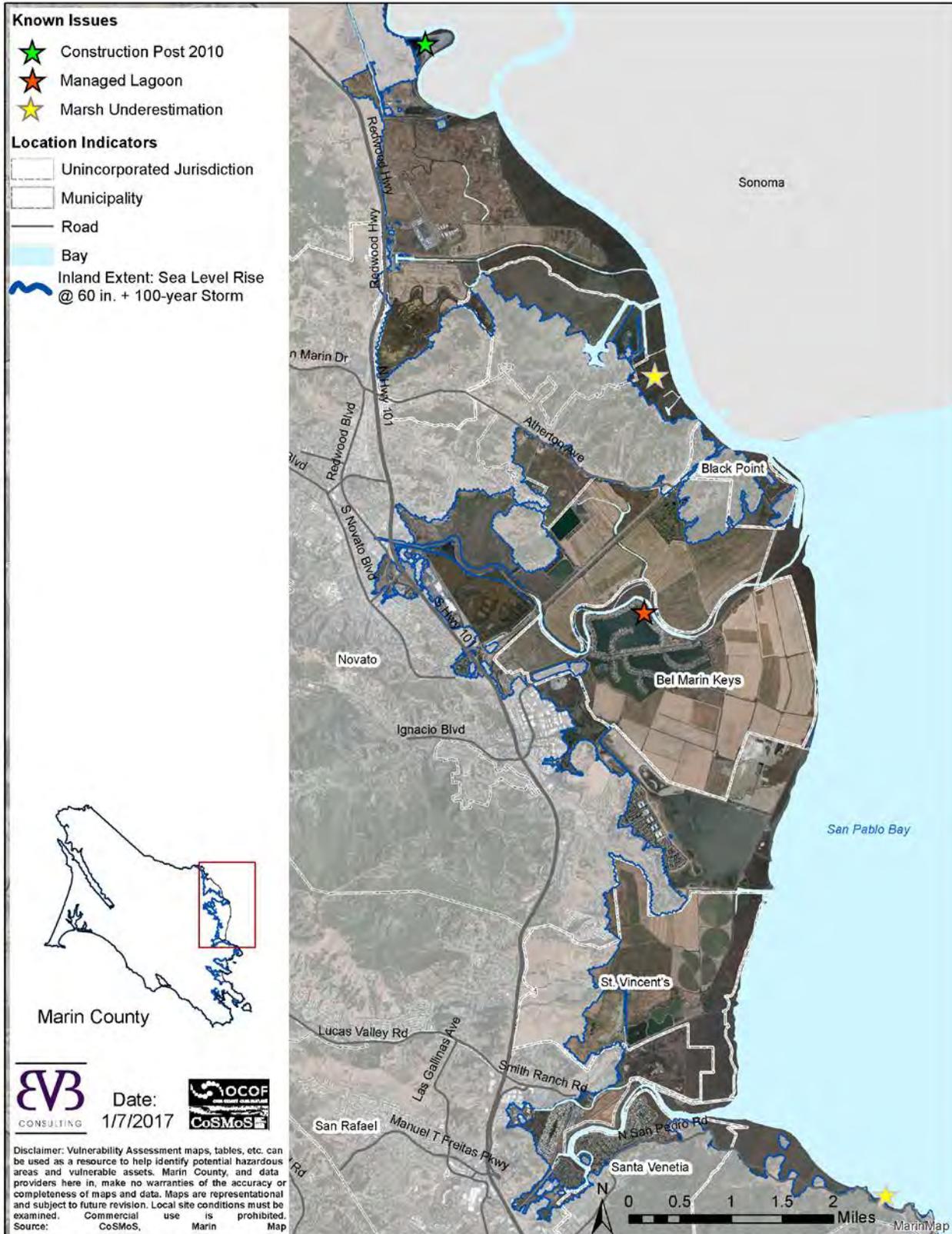
<sup>24</sup> P. Barnard. C-SMART Kick-off Meeting July 2014. [http://walrus.wr.usgs.gov/coastal\\_processes/cosmos/](http://walrus.wr.usgs.gov/coastal_processes/cosmos/)

<sup>25</sup> Annual mean Sea Level Rise, San Francisco Tidal Gage. [Www.psmi.org/data/obtaining/stations/10.php](http://www.psmi.org/data/obtaining/stations/10.php)

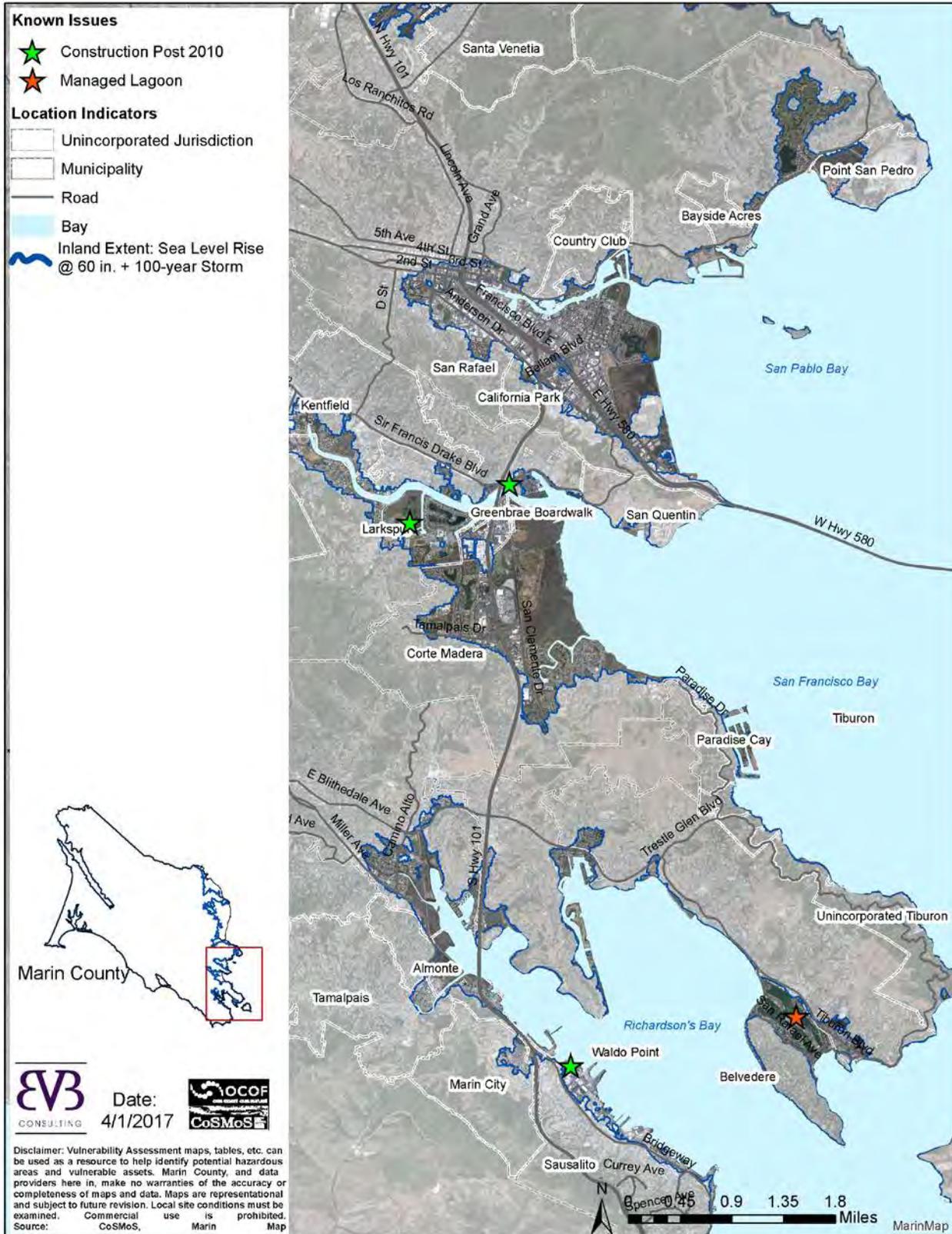
<sup>26</sup> IPCC Fourth Assessment Report: Climate Change 2007. Climate Change 2007: Working Group I: The Physical Science Basis. 10.7.2 Climate Change Commitment to Year 3000 and Beyond to Equilibrium. [https://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/ch10s10-7-2.html](https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch10s10-7-2.html)

<sup>27</sup> IPCC Fourth Assessment Report: Climate Change 2007. Climate Change 2007: Working Group I: The Physical Science Basis. 10.7.4 Commitment to Sea Level Rise. [https://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/ch10s10-7-4.html](https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch10s10-7-4.html)

Map 8. Northern Study Area Known Issues with CoSMoS Model



Map 9. Southern Study Area Known Issues with CoSMoS Model



## Sea Level Rise Maps & FEMA

Several shoreline communities already grapple with stormwater and storm surge flooding on a near yearly basis and qualify for federal flooding insurance under the Federal Emergency Management Agency (FEMA). FEMA maps flood prone area in maps called Flood Insurance Rate Maps (FIRMs). These maps, while related to flooding, do not consider future potential sea level rise flooding. As the sea level rises, FIRMS would need to be updated to represent the new existing conditions. Other major differences between FIRMS and the sea level rise maps in this assessment are:

- FIRMs are based on *historic and current* trends and assumptions. CoSMoS sea level rise maps are based on modeling of potential *future* conditions.
- FIRMS address bay surge and stormwater creek flooding. CoSMoS does not address stormwater creek flooding, and
- FIRMS can incorporate policy decisions to exclude the role of non-FEMA certified protective shoreline armoring. CoSMoS is based solely on elevation, such that any shoreline armoring that contributes to elevation is accounted for.

## Assessment Methods

As described in CalAdapt, vulnerability is based on an asset's exposure, sensitivity, and adaptive capacity to rising tides and bay surge threats. Such that, if an exposed asset is moderately or highly sensitive to sea level rise impacts, with low to no adaptive capacity, the asset is vulnerable.

Assets were identified using existing MarinMap geographic data layers for roads, trails, parks, public facilities, utility districts, buildings, and parcels, and Department of Fish and Wildlife sources for wildlife species, habitats, fishing piers, marinas, access points, and ports. The Technical Advisory Committee supplemented these data sources with additional assets. Note that not all vulnerable assets are mapped due to data conflicts or unavailable geographic data. This does not imply that an asset is not vulnerable. This is especially true for utility assets. The data layers generated span several years, and changes to the built environment may have occurred since the data was last updated. Where identified, these areas were manually adjusted to reflect known current conditions. For example, based on aerial imagery, Niel Cumings Elementray

school appears to be one large building, however, upon site visit, it becomes clear the site has four buildings connected by awnings. Improving the data comprehensively was not within the scope of this analysis, thus buildings numbers may be slightly off in some locations.

### Phase 1: Exposure

To determine what could be exposed to sea level rise at MHHW and/or a 100-year storm surge, the six BayWAVE scenarios, identified asset locations, and aerial imagery were overlaid in ArcGIS, a geographic statistical computer program. Assets intersecting sea level rise and storm scenarios were identified as exposed, and further assessed for sensitivity and adaptive capacity to determine if the asset is vulnerable to:

- Extreme event flooding during the annual highest high tides and/or storm surges that cause nuisance flooding,
- Inundation at, at least, one high tide a day, several days a month, that results in chronic flooding,
- Erosion and geomorphic evolution from higher high tides and extreme storm events,
- Wave run up and high winds in extreme storm events,
- Saltwater intrusion,
- Rising water table, and/or
- Habitat shifts (applicable to natural resources).

In addition to geographic extent, CoSMoS GIS layers illustrating potential flood depth at MHHW were spatially joined with each vulnerable asset yielding average depths for scenarios 1, 3, and 5. Flood depth was calculated by converting GIS vector data to raster data to break the flood depth layer into thousands of cells, each with an assigned flood value. For roads, a high and low value was calculated on the line segment. Bridges are not quantitatively accounted for in this assessment. For buildings, cells underlying the building footprint were averaged to one flood depth at MHHW for scenarios 1, 3, and 5 for each building. Note that flood depth data is not available for all vulnerable areas and assets, especially those that exist in the bay beyond mean sea level and already subject to tidal influences. The data presented in this Assessment is for what is available and may not directly compare with data presented under exposure.

Flood depth figures are displayed in the onset and depth tables in each profile. In these tables, roads

were assigned high and low values along the exposed segments for each scenario. Exposed road mileage provided is road miles, not lane miles. Lane mileage would more than double the mileage figures presented in this assessment. Where buildings are presented as a neighborhood group, a maximum average flood depth is provided. Where data is available, additional analysis summarizes how many buildings in each community could flood by one-foot flood depth intervals for scenarios 1, 3, and 5.

### Phases 2 & 3: Sensitivity & Adaptive Capacity

The project team interviewed more than 100 asset managers, such as fire chiefs, city planners, transportation agency staff, using the Asset Vulnerability Assessment Tool, available in Appendix A, to assess built and natural resource assets. The tool is designed based on previous pre- and post- disaster assessments conducted in the Bay Area, Southern California, New Orleans, New York City, and guidance from State of California and the U.S. EPA.<sup>28,29,30,31,32,33,34</sup>

Several public agency professionals were interviewed due to a high number of public assets in the exposed areas. Homeowners' association representatives were invited to be interviewed; however, home owners or non-public property owners were not individually interviewed. A list of interviews can be found in Appendix A

Asset managers were interviewed in person or by phone to answer two primary questions:

1. How **sensitive** is the asset to each exposure or threat?<sup>35</sup>
2. And if sensitive, what is the **adaptive capacity**, or the asset's ability to maintain its function without further intervention (human action)?<sup>36, 37,38, 39</sup>

Any asset deemed moderately or highly sensitive to flooding or storm damage, with low to no adaptive capacity is considered vulnerable. Other questions about previous disruptions and the nature of potential disruptions were discussed to provide context to the qualitative statements. The interview results were combined with geographic data to develop this Vulnerability Assessment.

Additional analysis was conducted to determine the potential monetary losses from storm damages to buildings in scenario 6. Scenario 6 is chosen because it is the worst case scenario selected for assessment. This method applies damage levels to all vulnerable buildings in scenario 6 based on the FEMA HAZUS model intervals for yellow, minor damage of \$5,000-17,000; orange, damage of \$17,001+; and red, destroyed, post-disaster inspection tags.<sup>40,41</sup> Information on the real estate website Zillow was used to estimate median market value of single-family homes in February 2016.

The vulnerabilities found in the assessment process are summarized in Asset, Municipal, and Unincorporated Marin Profiles.

<sup>28</sup> U.S. EPA. Being Prepared for Climate Change: A Workbook for Developing Risk-Based Adaptation Plans. August 2014.

<sup>29</sup> CURRV-Tijuana River Valley - <http://trner.org/currv/>  
<sup>30</sup> Bay Conservation & Development Commission: Adapting to Rising Tides. Hayward Resilience Study. 2014.

<sup>31</sup> City and County of San Francisco Sea Level Rise Committee. Guidance for incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation. September 2014.

<sup>32</sup> <http://mitigationguide.org/task-5/steps-to-conduct-a-risk-assessment-2/3-analyze-risk/>

<sup>33</sup> California Emergency Management Agency, California Emergency Natural Resource Agency. California Climate Adaptation Planning Guide (APG). July 2012. [http://resources.ca.gov/docs/climate/01APG\\_Planning\\_for\\_Adaptive\\_Communities.pdf](http://resources.ca.gov/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf)

<sup>34</sup> Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Mike Culp, IFC International, *Literature Review: Climate Change Vulnerability Assessment, Risk Assessment, and Adaptation Approaches*. [http://www.fhwa.dot.gov/environment/climate\\_change/adaptation/publications\\_and\\_tools/vulnerability\\_assessment/index.cfm#Toc236233837](http://www.fhwa.dot.gov/environment/climate_change/adaptation/publications_and_tools/vulnerability_assessment/index.cfm#Toc236233837)

<sup>35</sup> Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco. September 22, 2014. Appendix 5. OneSF Checklist

<sup>36</sup> Center for Science in the Earth System (CSES), University of Washington, *Conduct a Climate Resiliency Study*, Chapter 8. *Conduct a Climate Change Vulnerability Assessment*. <http://cses.washington.edu/db/pdf/snoveretalgb574ch8.pdf>

<sup>37</sup> Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Mike Culp, IFC International, *Literature Review: Climate Change Vulnerability Assessment, Risk Assessment, and Adaptation Approaches*. [http://www.fhwa.dot.gov/environment/climate\\_change/adaptation/publications\\_and\\_tools/vulnerability\\_assessment/index.cfm#Toc236233837](http://www.fhwa.dot.gov/environment/climate_change/adaptation/publications_and_tools/vulnerability_assessment/index.cfm#Toc236233837)

<sup>38</sup> California Energy Commission Public Interest Environmental Research Program. *Adapting to Sea Level Rise: A Guide for California's Coastal Communities*. 2012.

<sup>39</sup> Bay Conservation & Development Commission: Adapting to Rising Tides. Hayward Resilience Study. 2014.

<sup>40</sup> Federal Emergency management Agency (FEMA) Website. Hazus. Last updated July 8, 2015. <http://www.fema.gov/hazus>.

<sup>41</sup> 2016 dollars

#### Phase 4: Risk & Onset

Risk & onset assess when and how likely impacts will occur to prioritize actions, though this alone may not be adequate criteria for decision-making. Onset is determined by the scenario an asset is exposed under. The scenario indicates a “no later than” timeline, as opposed to a “not until after” timeline, thus onset could occur before the snap shot in time represented by each scenario. Because of this, this assessment uses near-, medium-, and long-term labeling corresponding with the NRC ranges for before 2030, 2050, and 2100 respectively in Table 1.

All vulnerable assets are at risk of flooding and/or increasing rates of subsidence. Two types of flooding could occur, tidal flooding at MHHW or seasonal storm flooding. All assets that experience tidal flooding will also experience storm surge flooding. Tidal flooding at the average higher high tide could flood an asset once a day, several days a month. Each day has two high tides, thus it is possible that some properties could flood twice a day. Land that is flooded at this frequency is not useable for land based development. Storms surge flooding analyzed in this assessment is a 100-year storm surge, such that this storm has a 1 percent chance of occurring each year.

#### Other Considerations Methods

As adaptation planning moves forward, more detailed study and assessment across each of the 3 E’s: economy, environment, and equity, will be critical. Moreover, the California Coastal Commission’s Sea Level Rise Policy Guidance calls for assessing these, legal consequences, and the cumulative and secondary consequences of the vulnerabilities.<sup>42</sup> The “Other Considerations” section in each asset profile begins to identify issues and opportunities for each “E,” and management. These sections are informed through literature review, asset manager interviews, and policy discussions with professional staff.

Economic: Highlights costs of damage, or preparation, and the cost burden to residents. Potential economic issues and opportunities were determined using several geographic and tabular data sources maintained by the County of Marin, US

<sup>42</sup> California Coastal Commission Sea Level Rise Policy Guidance: Interpretive Guidelines for addressing Sea Level Rise in Local Coastal Programs and Coastal Development. August 12, 2015. <http://www.coastal.ca.gov/climate/slrguidance.html>

Census, and Zillow. Note that population and monetary figures are based on current or historic values. Generally, both populations and property values are projected to grow, thus, this assessment underestimates the number of people and value of property that would be vulnerable in the future.

Environmental: Highlights how disruption to buildings, roads, septic systems, and other assets could have secondary impacts on the environment and wildlife. Environmental impacts were gathered from asset managers and literature review.

Equity: Highlights the disparity in cost burden across populations of different social and economic means, and how the social fabric of communities may shift. Several storms impacting the south (i.e. Hurricane Katrina, Hurricane Audrey) have “shown that natural disasters can cause the greatest harm to low-income communities and communities of color.”<sup>43</sup> Populations that may be at higher risk include, low-income, limited English speaking, children, and those with limited mobility or sensory abilities.

Management: Highlights political and management issues that will need to be considered when planning for sea level rise to ensure the public health, safety, and welfare of East Marin residents.

To gain a better idea of these secondary consequences, asset managers were asked several questions about the nature of the damage or disruption that could happen, levels of risk, persons impacted, and if environmental, economic, equity, or political issues could arise. Potential secondary impacts include:<sup>44, 45</sup>

- Contaminant releases from industrial sites or storage tanks,
- Loss of habitat from increased erosion,
- Loss of jobs and revenue streams,
- Loss of community or sense of place,
- Increased need for government services or intervention, and
- Potential injury and loss of life.

<sup>43</sup> The Impacts of Sea-Level Rise on the California Coast. California Climate Change Center. Heberger, M., Cooley, H., et. al. The Pacific Institute. CEC-500-2009-024-F. May 2009

<sup>44</sup> Delaware Coastal Programs, *Sea Level Rise Adaptation*. <http://www.dnrec.delaware.gov/coastal/Pages/SeaLevelRiseAdaptation.aspx>

<sup>45</sup> City and County of San Francisco Sea Level Rise Committee. *Guidance for incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation*. September 2014.

Collectively these methods determine what is vulnerable to sea level rise on the Marin shoreline and at what levels of sea level rise impacts could be felt by. This analysis can be a useful in assessing asset and community sea level rise vulnerabilities, and developing adaptation strategies and policies well suited for this unique and valuable bay region.

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