Date Posted: 1/15/2016

NORTH MARIN WATER DISTRICT
AGENDA - REGULAR MEETING
January 19, 2016 – 7:00 p.m.
District Headquarters
999 Rush Creek Place
Novato, California

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Est. Time	Item	Subject
7:00 p.m.		***CALL TO ORDER***
	1.	***APPROVE MINUTES FROM REGULAR MEETING***, January 5, 2016
	2.	***GENERAL MANAGER'S REPORT***
	3.	***OPEN TIME: (Please observe a three-minute time limit)***
		This section of the agenda is provided so that the public may express comments on any issues not listed on the agenda that are of interest to the public and within the jurisdiction of the North Marin Water District. When comments are made about matters not on the agenda, Board members can ask questions for clarification, respond to statements or questions from members of the public, refer a matter to staff, or direct staff to place a matter of business on a future agenda. The public may also express comments on agenda items at the time of Board consideration.
	4.	***STAFF/DIRECTORS REPORTS***
	5.	***QUARTERLY FINANCIAL REPORT***
	6.	***MONTHLY PROGRESS REPORT w/Customer Service Questionnaire***
		ACTION CALENDAR
	7.	***Approve:*** Quitclaim Existing Unused Easement in Trade for New Easement at 825 Delong
	8.	***Approve:*** New Hires for the Assistant Distribution and Treatment Plant Operator Position
	9.	***Approve:*** Pipeworker Promotion
		INFORMATION ITEMS
	10.	Oceana Marin Master Plan Update (Presentation by consultant Ed Nute)
	11.	Marin LAFCO Countywide Water Service Study Final Report – NMWD Comments
	12.	West Marin Water Outside District Water Consumption (2011-2015)
	13.	***MISCELLANEOUS*** Disbursements Self-Insured Workers' Comp – 2nd Quarter Status Report Renewal of Oceana Marin Liability Insurance News Articles: Marin's Board of Supervisors Marin makes water goals for December Dick Spotswood: Race begins to take form to succeed Kinsey

All times are approximate and for reference only.
The Board of Directors may consider an item at a different time than set forth herein.

(Continued)

Est. Time	Item	Subject
		HSU studies to examine how Eel River dams impact salmon Former state legislator Noreen Evans enters race for Sonoma County supervisor Marin IJ launches new public affairs program with focus on open space trails conflict Petition to label water additives $12 parcel tax proposed for Marin, Bay Area counties for bay restoration Federal emergency services official seeks Kinsey's supervisorial seat
8:30 p.m.	14.	***ADJOURNMENT***

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DRAFT
NORTH MARIN WATER DISTRICT
MINUTES OF REGULAR MEETING
OF THE BOARD OF DIRECTORS
January 5, 2016

CALL TO ORDER

President Schoonover called the regular meeting of the Board of Directors of North Marin Water District to order at 7:00 p.m. at the District headquarters and the agenda was accepted as presented. Present were Directors Jack Baker, Rick Fraites, Stephen Petterle, Dennis Rodoni and John Schoonover. Also present were General Manager Chris DeGabriele, District Secretary Katie Young, Auditor-Controller David Bentley and Chief Engineer Drew McIntyre.

Novato Customer Mike Jolly, District employees Ryan Grisso (Water Conservation Coordinator), Robert Clark (Operations/Maintenance Superintendent) and Tony Arendell (Construction/Maintenance Superintendent) were in the audience.

MINUTES

On motion of Director Baker, seconded by Director Fraites, the Board approved the minutes from the previous meeting as presented by the following vote:

AYES: Directors Baker, Fraites, Petterle, Rodoni and Schoonover

NOES: None

GENERAL MANAGER'S REPORT

Employee Report

Mr. DeGabriele advised the Board that one of the young construction laborers resigned yesterday for personal reasons and that staff will be looking to replace him with a recently released temporary employee laborer. He informed the Board that staff is also interviewing for an Assistant Water Treatment Plant and Water Distribution Operator to replace recent retiree Vernon Stafford. He noted that staff's first attempt to replace the position with a journeyman operator was unsuccessful, so staff is now looking at operator trainees and it is likely staff would need to hire two to backstop the staff and prepare for the future.

Water Storage Update

Mr. DeGabriele advised the Board that rainfall this year is at 6.75" and has increased recently. He stated that the rainfall is still less than average but Stafford Lake is collecting runoff and he is hopeful it will fill. He informed the Board that on the Russian River water storage is much improved, up 25,000AF combined in the two reservoirs since early December.

ACWA Working Group

Mr. DeGabriele informed the Board that he and Pablo Ramudo will participate in an ACWA working group conference call this Thursday about Department of Drinking Water fees. He reminded the Board that at the last meeting he reported that these fees will increase. He stated that he and Pablo have put together two alternative models and distributed them to the working group and it's generated a lot of comments. He noted that he's not confident at this point that the working group will come together with an alternative proposal but he will keep the Board apprised.

Oceana Marin Homeowners Meeting

Mr. DeGabriele advised the Board that he and Drew McIntyre will be attending the Oceana Marin Homeowners Association semi-annual meeting on Saturday, January 16th to update the members about activities and to provide a financial and operations update.

OPEN TIME

President Schoonover asked if anyone in the audience wished to bring up an item not on the agenda and there was no response.

STAFF / DIRECTORS' REPORTS

President Schoonover asked if staff or Directors wished to bring up an item not on the agenda and the following item was discussed:

Robert Clark reported to the Board on the water outage that occurred on Monday afternoon in the Green Point, Black Point and Stone Tree areas of Novato. He recapped where the leak occurred and that it was difficult to locate since it is a low lying area with many open drainage ditches. He advised that approximately 250,000 gallons of water were discharged and that all regulatory agencies were notified.

Director Baker stated that he appreciated the email from Mr. DeGabriele advising the Board of the occurrence.

Mr. DeGabriele applauded the efforts of Robert, Tony and staff and everyone was involved. He stated that customer service representatives took over 80 phone calls and there were notices provided to customers via electronic media.

PUBLIC HEARING – REVISIONS OF WATER CONSERVATION REGULATIONS 15 & 17

Ryan Grisso, Water Conservation Coordinator, reminded the Board of the initial review of the proposed changes to Regulations 15 & 17 which occurred at the December 15, 2015 meeting. He stated that the reason for the changes is because the State has updated the water efficient landscape ordinance, so staff took the opportunity to make updates to the District regulations. Mr. Grisso stated that changes to the regulations include: adding a provision for the Board to set penalties for water waste violators, updated plant selection criteria, updated lawn allowance, front yard restrictions and put an audit requirement for new development.

Mr. Grisso advised the Board that there were additional minor changes to the Regulations, since they have not been reviewed in six years.

President Schoonover opened the public hearing at 7:16 p.m.

Director Baker asked if Mr. Grisso has received any feedback from the impact of the changes from contractors, public, or landscapers. Mr. Grisso replied no comments were received. He stated that most other agencies in the District vicinity have already made the updates to their regulations.

Upon hearing no further discussion, President Schoonover closed the public hearing at 7:20 p.m.

On motion of Director Petterle, seconded by Director Baker the Board approved Resolution 16-01 entitled: "Resolution of the Board of Directors of North Marin Water District Amending Regulation 15 – Water Conservation – Novato Service Area" and 16-02 entitled "Resolution of the Board of Directors of North Marin Water District Amending Regulation 17 – Water Conservation – West Marin Service Area" amending Regulations 15 and 17 by the following vote:

AYES: Directors Baker, Fraites, Petterle, Rodoni and Schoonover

NOES: None

CONSENT CALENDAR

On the motion of Director Petterle, seconded by Director Fraites, the Board approved the following items on the consent calendar by the following vote:

AYES: Directors Baker, Fraites, Petterle, Rodoni and Schoonover

NOES: None

OUTSIDE BOUNDARY WATER SERVICE AGREEMENTS YEE AND FONTES

The Board authorized Outside Water Service Agreements for Yee (APN 019-320-10) and Fontes (APN 019-320-21) and approved Resolution 16-03 entitled: "Authorization of Execution of High Pressure Water Service Facilities Construction Agreement with Leang S. Yee" and Resolution 16-04 entitled: "Authorization of Execution of High Pressure Water Service Facilities Construction Agreement with Michael Fontes Trust."

RISING SUN ENERGY CENTER WATER USE SURVEY AGREEMENT

The Board authorized the General Manager to execute the agreement for an amount not-to-exceed $11,000 with Rising Sun Energy Center, to fund the water portion of the CYES "Green House Call" program through calendar year 2017, with contingency for future amendments not-to-exceed $5,000.

ACTION CALENDAR

DATE AND TIME OF SPECIAL MEETING – PLANNING WORKSHOP

Mr. DeGabriele reminded the Board that every two years for the last decade, the Board has held a special meeting and conducted a Board Planning Workshop. He stated that this special meeting is held to focus and concentrate on workshop activities. He advised the Board that David Bentley will provide an updated financial model and requested that the Board set a date and time for the planning workshop.

On motion of Director Petterle, seconded by Director Rodoni, the Board approved February 9th, 2016 as the special meeting from 6 p.m. to 8 p.m. at the District Offices for the Board Planning Workshop by the following vote:

AYES: Directors Baker, Fraites, Petterle, Rodoni and Schoonover

NOES: None

DATE AND TIME OF SPECIAL MEETING – ETHICS TRAINING

Mr. DeGabriele advised the Board that every two years, the Board and elected officials must complete two hours of ethics training. He stated that this year staff thought it would be a good idea to have the District's legal counsel come to the office and provide the training. He noted that it will provide an opportunity to become more familiar with legal counsel staff.

On motion of Director Petterle, seconded by Director Fraites, the Board approved February 9, 2016 as the special meeting from 3 p.m. to 5 p.m. at the District Offices for the Ethics Training with District's legal counsel by the following vote:

AYES: Directors Baker, Fraites, Petterle, Rodoni and Schoonover

NOES: None

NMWD COMMENTS ON THE CENTRAL CALIFORNIA COAST STEELHEAD RECOVERY PLAN

Mr. DeGabriele provided the Board with the District's comments on the Coastal Multi-Species Recovery Plan, principally for steelhead in Novato Creek. He stated that the recovery plan is a voluminous document covering Chinook salmon and steelhead trout along coastal California from the Oregon border to Santa Cruz, including streams tributary to San Francisco Bay. He provided the Board with the Executive Summary of the Plan. Mr. DeGabriele advised the Board that he has had the opportunity to comment on the recovery plan twice previously as signatory to the Statement of Understanding for Recovery Planning Partnership and many of his currernt comments are consistent with those made previously. He noted that they have been edited, embellished and guided by fishery consultants that the District has recently hired to aid in this effort, Jean Baldridge from CARDNO Associates and Bill Hearn from Hearn Consulting.

On motion of Director Baker, seconded by Director Fraites, the Board authorized the General Manager to send the comments on the Coastal Multi-Species Recovery Plan to NOAA Fisheries recovery team by the following vote:

AYES: Directors Baker, Fraites, Petterle, Rodoni and Schoonover

NOES: None

INFORMATION ITEMS

DOMINICAN UNIVERSITY INSTITUTE FOR LEADERSHIP STUDIES – THE MAKING OF LEADERS

Tony Arendell, Construction/Maintenance Superintendent thanked the Board for the opportunity to attend the Dominican University Institute for Leadership Studies. He advised that he picked up new skills on coaching and plans to implement "lessons learned" overviews after completion of larger jobs with his staff. Tony also made contact with the MMWD Facilities Manager who also attended the program resulting in improved relationships with his MMWD counterpart.

Mr. Arendell provided the Board with the PowerPoint presentation he created for his class project which was development of a Vacuum Truck spoils pit and handling system for the District.

Director Baker suggested Mr. Arendell reach out to County Flood Control staff to see if there's an alternate disposal location for Vacuum Truck spoils material.

Director Petterle stated that he thought the plan designed by Mr. Arendell was a good one.

MARIN LAFCO COUNTYWIDE WATER SERVICE STUDY

Mr. DeGabriele advised the Board that next Thursday, January 14th, the Countywide Water Service Study will be reviewed. He noted that last evening Marin LAFCO sent out another email advising that they have completed the work on final report and that it is likely that Marin LAFCO will take two meetings to review, make determinations and accept the final report.

Mr. DeGabriele informed the Board that he had an opportunity today to briefly review the staff report, but hasn't had a chance to review it fully. He noted that some of the District's comments have been addressed. He stated that the issue to study consolidation in the County is something the LAFCO commission will make the determination on whether to pursue the issue. Mr. DeGabriele informed the Board that the report recommended there be a review of community sewer systems in West Marin communities. He stated that he will take the opportunity to go through the final report and will attend the LAFCO meeting next Thursday and the second meeting on February 11th to make comments and to urge the LAFCO commission, at a minimum, to not take on the sewer service issue and to address the District's other comments made on the report.

Director Petterele requested that the full Marin LAFCO Countywide Water Study report be sent to the Board. Mr. DeGabriele replied that the report is nearly 500 pages long and is available on the internet. Mr. DeGabriele will forward the internet link to the Board.

Director Rodoni suggested that the Marin LAFCO insistence on considering sewer systems in West Marin communities may be coming from the County of Marin staff or Supervisors.

NBWRA BOD UPDATE – DECEMBER 14, 2015

Mr. McIntyre provided the Board with an update form the North Bay Water Reuse Authority Meeting on December 14, 2015. He advised that the final NBWRA Grant Application has been submitted in the amount of $4.847M, $2.75M of which is for the District's Central Service Area Recycled Water project. He stated that the confirmation of grant funding won't be known until May or June and that District staff plans to advertise the project in March, but will wait to award until the grant funding is confirmed.

TAC MEETING – JANUARY 4, 2016

Mr. DeGabriele provided the Board with a summary of the January 4, 2016 meeting. He stated that Sonoma County Water Agency has not yet determined if they will request a Temporary Urgency Change Order as it will be based on Lake Mendocino's storage which continues to rise. He stated that historically the majority of Lake Mendocino water comes from diversions out of the Eel River. He noted that Lake Pillsbury was below 12,000AF in mid-December and is likely over 50,000AF today. Mr. DeGabriele informed the Board that the PG&E variance from releases water

out of Lake Pillsbury has been removed but the variance on the diversions through the Potter Valley Project and into the East Fork Russian River continues due to the work on the penstock tunnel which will continue through March 2016.

Director Fraites asked what the capacity of Lake Pillsbury is. Mr. DeGabriele responded approximately 81,000AF.

Mr. DeGabriele advised the Board that Jennifer Burke reported to the TAC on the State Board workshop and stated that the State Board has chosen not to recommend there be a regional compliance option through the next phase of the Urban Water Conservation Requirements and the only changes that they do propose is an adjustment for population growth and an adjustment for climate (warm areas) conservation standards. Mr. DeGabriele advised the Board that tomorrow is the final day to make comments on the proposed Regulatory Framework for extended Emergency Urban Water Conservation Regulations, and that another letter from NMWD was sent thanking the State Board for the opportunity to comment and urging that they reconsider regional options, carry over saving 2015 to 2016 and provide flexibility if local areas has enough water supply to meet service area needs. He stated that he does not have a lot of confidence the State will change from the Regulatory Framework now proposed.

Mr. DeGabriele informed the Board that at the February 1st meeting a new WAC Chair and Vice Chair will be elected (Councilman Healy as Chair and Councilman Galliad, Vice Chair).

Mr. DeGabriele advised the Board that a Water Supply Coordination Council Meeting is scheduled for January 22nd.

NBWA MEETING – JANUARY 8, 2016

Director Baker advised that he will attend the North Bay Watershed Association meeting on January 8th.

MISCELLANEOUS

The Board received the following miscellaneous information: Disbursements, Meter Reading Accuracy, Letter from City of Novato, and Local Government Coalition Files Constitutional Amendment.

The Board received the following news articles: Flood tax measures loom for Novato, San Rafael, and House of Reps tightens Coast Guard bill.

The Board also received the following miscellaneous item at the meeting: Technical Advisory Committee Meeting Notes – January 4, 2016. The Board also received the following news article: Novato water pipeline break affects Green Point and Black Point.

Director Baker stated that the letter from the City of Novato regarding redevelopment of NMWD's headquarters site was well written and prompted by the letter Mr. DeGabriele wrote last year. Mr. DeGabriele stated that the letter provided us with closure and the District is able to go on with the remodel of the office building.

ADJOURNMENT

President Schoonover adjourned the meeting at 8:00 p.m.

Submitted by

Katie Young
District Secretary

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NORTH MARIN WATER DISTRICT

FINANCIAL STATEMENT
FISCAL YEAR 2015-16

December 2015

1/14/2016 16:00

NORTH MARIN WATER DISTRICT
FINANCIAL STATEMENTS
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MEMORANDUM

To: Board of Directors January 15, 2016

From: David L. Bentley, Auditor-Controller

Subj: Information – FY15/16 December Financial Statement
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FISCAL YEAR PERFORMANCE COMPARED TO THE ANNUAL BUDGET

CONSOLIDATED SUMMARY Actual vs. Budget	Dec-15	FYTD 15/16	FY15/16 Budget	FYTD / Budget %
Operating Revenue	$1,084,178	$9,272,030	$19,918,000	47%
Operating Expense	1,364,382	8,538,205	18,149,000	47%
Non-Operating Revenue / (Expense)	(13,955)	(270,556)	(645,000)	42%
Net Income / (Loss)	($294,159)	$463,269	$1,124,000	41%
Other Sources / (Uses)*	(8,891)	(2,877,342)	(2,299,000)	125%
Cash Increase / (Decrease)	($303,050)	($2,414,073)	($1,175,000)	205%

* See Page 8.

For the first half of the fiscal year (50%) the District generated a net income of $463,269 and saw a net cash decrease of $2,414,073. On a seasonally adjusted basis, Operating Revenue came in 15% under budget and Operating Expense came in 9% under budget. Thirty-three percent of the Capital Improvement Projects Budget has been expended this fiscal year-to-date. The District's cash balance decreased $261,952 during the month. The FYTD cash balance declined $2,414,073 due primarily to payments for the AEEP ($3,918,403), offset by Caltrans receipts ($857,484) and repayment of an employee housing loan ($300,000). At December 31 Caltrans owed the District $2,380,998 for the AEEP.

SUMMARY INCOME STATEMENTS BY SERVICE AREA PRESENTED IN ACCORDANCE WITH GENERALLY ACCEPTED ACCOUNTING PRINCIPALS

NOVATO WATER Year over Year Comparison	Dec-15	FYTD 15/16	FYTD 14/15	FY16 vs 15 Up/(Down)
Operating Revenue	$1,013,229	$8,360,904	$9,077,170	(8%)
Operating Expense	1,249,572	7,712,638	7,788,723	(1%)
Other Income / (Expense)	(32,758)	(173,972)	(163,931)	6%
Net Income / (Loss)	($269,100)	$474,294	$1,124,516	(58%)
Active Accounts	20,524	20,524	20,498	0%
Consumption (MG)	131	1,204	1,381	(13%)
Average Commodity Rate / 1,000 gal (net)	$4.91	$5.09	$4.94	3%
Income / (Loss) / Active Account	($13.11)	$23.11	$54.86	(58%)
Income / (Loss) / 1,000 Gal	($2.05)	$0.39	$0.81	(52%)
Connection Fee Revenue	$28,600	$177,800	$753,600	(76%)
Caltrans Capital Contribution	$234,044	$2,359,979	$7,519,184	(69%)
MMWD AEEP Capital Contribution	$0	$245,000	$245,000	0%
Developer 'In-Kind' Contributions	$27,092	$202,809	$160,411	26%

Consumption for the period was 13% less than the prior year same period. Total operating revenue, which includes wheeling and other miscellaneous service charges, decreased 8% ($716,267) due to the consumption decrease offset by the 3% rate increase effective June 1, 2015. Total operating expense was 1% ($76,085) less than last year same period.

The Stafford Treatment Plant produced 333 MG this fiscal year at a cost of $2,921/MG[1] versus $2,389/MG[3] from SCWA. The budget for Stafford is 750 MG at a cost of $2,780/MG.

Salary and benefit cost charged to Novato operations was 2% more than last year same period. Staff time (hours) charged to Novato operations was 3% more than last year same period. Salary and benefit cost was $2,755,277 which was 45% of the $6,127,000 budget for Novato operations.

The fiscal year-to-date net income (which includes non-operating items such as interest revenue and expense) of $474,294 compares to a budgeted net income for the year of $1,356,000 and to a net income of $1,124,516 for the prior year same period. $3,731,256 (41%) of the Novato Water Capital Improvement Project Budget was spent versus $9,028,433 (52%) for the prior year same period. $177,800 in connection fees was collected ($536,000 is budgeted). The Novato cash balance decreased $433,909 in December, and stood at $8,886,751 at month end, compared to a budgeted projection of $9,300,000 at June 30, 2016.

NOVATO RECYCLED		FYTD	FYTD	FY16 vs 15
Year over Year Comparison	Dec-15	15/16	14/15	Up/(Down)
Operating Revenue	$8,840	$422,319	$422,034	0%
Operating Expense	37,676	402,594	418,321	(4%)
Other Income / (Expense)	(33,669)	(142,864)	(117,715)	21%
Net Income / (Loss)	($62,506)	($123,139)	($114,002)	8%
Active Accounts	44	44	44	0%
Consumption (MG)	1.4	82.8	85.7	(3%)
Average Commodity Rate / 1,000 gal (net)	$4.92	$4.92	$4.73	4%
Deer Island Production (MG)	0.0	6.2	1.0	519%
Novato Sanitary Production (MG)	0.0	51.0	49.7	3%
Las Gallinas Production (MG)	0.8	25.8	30.9	(16%)
Potable Water Input (MG)	0.1	6.9	6.9	1%

82.8 MG was delivered to RW customers this fiscal year, 3% less than the prior year same period. Operating revenue was about the same as last year same period primarily due to the June 1, 2015 4% commodity rate increase, offset by the consumption decrease. Total operating expense was $15,727 (4%) less than the prior year same period. The recycled water was produced at a cost of $2,385/MG[2] versus $2,389/MG[3] from SCWA. The budgeted production cost of recycled water is $2,984/MG.

The fiscal year net loss of $123,139 compares to a budgeted net loss for the year of $315,000 and a net loss of $114,002 for the prior year same period. $435,615 (12%) of the Capital Improvement Project Budget has been expended this fiscal year-to-date. The Novato Recycled cash balance decreased $12,100 in December, and stood at $1,304,906 at month end, compared to a budgeted projection of $1,567,000 at June 30, 2016.

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[1] Stafford production cost = TP op expense ($544,237) + SRF loan interest ($148,984) + plant depreciation ($279,374) / 333 MG produced

[2] Recycled Water production cost = purchase water cost ($92,570) + treatment expense ($2,389) + Deer Island RW Facility SRF loan interest ($34,169) + Deer Island plant depreciation ($68,339) /82.8 MG produced

[3] SCWA production cost per MG = O&M charge ($2,034) + debt service charge ($104) + Russian River conservation charge ($213) + Russian River projects charge ($38)

WEST MARIN WATER		FYTD	FYTD	FY16 vs 15
Year over Year Comparison	Dec-15	15/16	14/15	Up/(Down)
Operating Revenue	$45,550	$390,953	$409,395	(5%)
Operating Expense	56,003	300,685	318,814	(6%)
Other Income / (Expense)	17,947	9,747	10,091	(3%)
Net Income / (Loss)	$7,495	$100,015	$100,672	(1%)
Active Accounts	778	778	777	0%
Consumption (MG)	3.8	32.2	34.7	(7%)
Average Commodity Rate / 1,000 gal (net)	$7.96	$9.41	$9.29	1%
Income/ (Loss) / Active Account	$9.63	$128.55	$129.57	(1%)
Income / (Loss) / 1,000 Gal	$1.97	$3.10	$2.90	7%
Connection Fee Revenue	$0	$0	$22,800	(100%)
Developer 'In-Kind' Contributions	$3,964	$13,632	$0	-

Consumption for the period was 32.2 MG, 7% less than the prior year same period. Operating revenue of $390,953 was $18,442 (5%) less than last year same period due to the consumption decrease offset by the 5% rate increase effective July 1, 2015.

Operating expenditures were $300,685, 6% less than the previous year same period. The fiscal year to date net income of $100,015 compares to a budgeted annual net income of $74,000 and to a net income of $100,672 for the prior year same period. $152,021 (50%) of the Capital Improvement Project Budget has been expended this fiscal year-to-date, and no connection fees were collected ($23,000 is budgeted). The West Marin Water cash balance increased $38,282 in December, due in part to receipt of $24,000 on first-half tax revenue, and stood at $1,165,797 at month end, compared to a budgeted projection of $873,000 at June 30, 2016.

OCEANA MARIN SEWER		FYTD	FYTD	FY16 vs 15
Year over Year Comparison	Dec-15	15/16	14/15	Up/(Down)
Operating Revenue	$16,559	$97,854	$93,572	5%
Operating Expense	21,131	122,289	99,606	23%
Other Income / (Expense)	34,524	36,534	26,085	40%
Net Income / (Loss)	$29,952	$12,099	$20,051	(40%)
Active Accounts	229	229	229	0%
Monthly Sewer Service Charge	$71	$71	$68	4%
Income / (Loss) / Active Account	$130.80	$52.83	$87.56	-
Connection Fee Revenue	$23,690	$23,690	$15,200	56%

Operating revenue of $97,854 was 5% more than the previous year same period same period due to the 4% rate increase effective July 1, 2015. Operating expenditures were 23% ($22,683) higher than the previous year same period. The operating expenditure increase is due in part to grit chamber and grinder maintenance not done last year ($5,628) and response to the force main break on Thanksgiving Day ($6,294). The fiscal year-to-date net income of $12,099 compares to a budgeted annual income of $9,000 and to a net income of $20,051 for the prior year same period. 1% of the Capital Improvement Project Budget has been expended this fiscal year-to-date.

$32,198 in connection and annexation fees were collected ($15,000 is budgeted). The Oceana Marin cash balance increased $145,775 in December, as we received both the first-half property tax revenue ($26,000) and the first-half sewer service charge revenue which is collected on the tax roll ($107,309), and stood at $416,239 at month end, compared to a budgeted projection of $351,000 at June 30, 2016.

NORTH MARIN WATER DISTRICT
STATEMENT OF NET POSITION
FOR THE PERIOD ENDING DECEMBER 31, 2015

	TOTAL	NOVATO WATER	NOVATO RECYCLED	WEST MARIN WATER	OCEANA MARIN SEWER
ASSETS					
Cash & Investments					
Unrestricted/Undesignated Cash	$478,492	$0	$0	$134,461	$344,031
Restricted Cash (Note 1)					
Connection Fee Fund	$138,508	$0	$0	$132,933	$5,575
Wohler Pipeline Financing Fund	400,193	400,193	0	0	0
Collector #6 Financing Fund	1,573,459	1,573,459	0	0	0
Revenue Bond Redemption Fund	30,000	0	0	30,000	0
Bank of Marin Project Fund	649,696	0	0	649,695	0
Deer Island RWF Replacement Fund	410,647	0	410,647	0	0
Capital Replacement & Expansion Fund	269,490	0	269,490	0	0
Tax Receipts Held in Marin Co Treasury	249	0	0	248	1
STP SRF Loan Fund-Marin Co Treasury	682,374	682,374	0	0	0
RWS North/South SRF Payment Fund	614,299	0	614,299	0	0
Designated Cash (Note 2)					
Liability Contingency Fund	922,285	823,400	0	98,885	0
Self-Insured Workers' Compensation Fund	599,166	562,694	10,470	19,371	6,632
Retiree Medical Benefits Fund	3,498,629	3,498,629	0	0	0
Maintenance Accrual Fund	1,346,709	1,346,709	0	0	0
Conservation Incentive Rate Fund	40,204	0	0	40,204	0
Operating Reserve Fund	120,000	0	0	60,000	60,000
Total Cash	$11,774,400	$8,887,458	$1,304,906	$1,165,797	$416,239
Gain/(Loss) on MV of Investments	(707)	(707)	0	0	0
Market Value of Cash & Investments	$11,773,693	$8,886,751	$1,304,906	$1,165,797	$416,239
Current Assets					
Net Receivables - Consumers	$2,094,997	$1,935,820	$91,349	$77,584	($9,755)
RW Expansion North Area Debt Service	2,589,764	2,380,811	103,695	7,704	97,554
Prepaid Expense	279,381	277,494	0	0	1,887
Bank of Marin Debt Service	5,300	5,300	0	0	0
Interest Receivable	14,952	14,952	0	0	0
Inventories	513,638	513,638	0	0	0
Deposits Receivable	27,426	27,426	0	0	0
Total Current Assets	$5,525,456	$5,155,439	$195,044	$85,288	$89,686

NORTH MARIN WATER DISTRICT
STATEMENT OF NET POSITION
FOR THE PERIOD ENDING DECEMBER 31, 2015

	TOTAL	NOVATO WATER	NOVATO RECYCLED	WEST MARIN WATER	OCEANA MARIN SEWER
Loans Receivable					
Employee Loans (Note 3)	$934,233	$934,233	$0	$0	$0
Other Long Term Receivables	2,297,885	0	2,297,885	0	0
Loans Receivable	$3,232,118	$934,233	$2,297,885	$0	$0
Property and Plant					
Land & Land Rights	$1,473,091	$1,368,872	$0	$103,411	$808
Dam, Lake, & Source Facilities	5,514,636	5,022,224	0	492,412	0
Treatment Facilities	21,082,445	17,561,535	2,666,198	319,913	534,799
Storage Facilities	20,586,721	18,203,039	519,014	1,864,669	0
Transmission Facilities	5,489,830	5,367,506	0	122,324	0
Distribution Facilities	81,849,422	58,841,126	17,266,234	5,742,062	0
Sewer Mains, Pumps, & Laterals	1,176,459	0	0	0	1,176,459
Sub-Total	$137,172,604	$106,364,302	$20,451,445	$8,644,791	$1,712,067
Less Accumulated Depreciation (Note 4)	(45,586,242)	(39,318,744)	(2,100,372)	(3,262,396)	(904,730)
Net Property and Plant	$91,586,363	$67,045,557	$18,351,073	$5,382,395	$807,337
Buildings and Equipment (Note 5)					
Buildings	$1,902,893	$1,902,893	$0	$0	$0
Office Equipment	683,142	683,142	0	0	0
Laboratory Equipment	299,383	299,383	0	0	0
Trucks & Automobiles	1,188,327	1,188,327	0	0	0
Construction Equipment	790,971	790,971	0	0	0
Tools, Shop Equipment	215,148	215,148	0	0	0
Sub-Total	$5,079,865	$5,079,865	$0	$0	$0
Less Accumulated Depreciation (Note 4)	(3,734,747)	(3,734,747)	0	0	0
Net Buildings and Equipment	$1,345,118	$1,345,118	$0	$0	$0
Construction In Progress					
Developer	$638,816	$624,923	$0	$10,504	$3,390
District	20,797,928	19,650,838	686,834	449,620	10,636
Total Construction in Progress	$21,436,744	$20,275,761	$686,834	$460,124	$14,026
Net Utility Plant	$114,368,225	$88,666,436	$19,037,907	$5,842,519	$821,363
Deferred Outflow of Resources	$757,200	$757,200	$0	$0	$0
TOTAL ASSETS	$135,656,691	$104,400,058	$22,835,741	$7,093,604	$1,327,288

NORTH MARIN WATER DISTRICT
STATEMENT OF NET POSITION
FOR THE PERIOD ENDING DECEMBER 31, 2015

	TOTAL	NOVATO WATER	NOVATO RECYCLED	WEST MARIN WATER	OCEANA MARIN SEWER
LIABILITIES AND NET ASSETS					
Current Liabilities					
Trade Accounts Payable	$1,976,276	$1,948,430	$26,132	$0	$1,714
Reimbursement Prog. Unclaimed Funds	5,250	5,250	0	0	0
Bond Debt Principal Payable-Current	21,000	0	0	21,000	0
Loan Debt Principal Payable-Current	947,561	395,659	549,420	2,483	0
Bank of Marin Principal Payable-Current	326,348	284,575	0	41,773	0
Bond/Loan Debt Interest Payable-Current	1,727	854	0	873	0
Accrued Interest Payable-SRF Loan	74,323	1,215	73,109	0	0
Deposits/Performance Bonds	137,882	117,382	0	18,500	2,000
Unemployment Insurance Reserve (Note 7)	25,350	25,350	0	0	0
Workers' Comp Future Claims Payable	42,035	39,092	1,093	1,387	462
Payroll Benefits (Note 8)	845,083	783,101	21,982	30,000	10,000
Due To Other Funds (Note 9)	0	0	0	0	0
Deferred Revenue	97,554	0	0	0	97,554
Total Current Liabilities	$4,500,389	$3,600,907	$671,736	$116,016	$111,730
Restricted Liabilities					
Construction Advances	$237,912	$226,302	$10,000	$0	$1,610
Total Restricted Liabilities	$237,912	$226,302	$10,000	$0	$1,610
Long Term Liablilities (Note 6)					
Bonds Outstanding - PR6 (FmHA)	$56,000	$0	$0	$56,000	$0
Bonds Outstanding - PRE1 (FmHA)	50,000	0	0	50,000	0
Drought Loan (EDA)	19,629	17,668	0	1,961	0
STP Rehab SRF Loan	11,612,245	11,612,245	0	0	0
RWF SRF Loan	2,615,529	0	2,615,529	0	0
RWS North/South Expansion SRF Loan	8,752,919	0	8,752,919	0	0
Bank of Marin Loan	6,424,910	5,602,522	0	822,388	0
Net Pension Liability @ 6/30/14	6,701,264	6,701,264	0	0	0
Retiree Health Benefits Payable	839,924	839,924	0	0	0
Total Long Term Liabilities	$37,072,420	$24,773,622	$11,368,448	$930,350	$0
Deferred Inflow of Resources	2,182,010	2,182,010	0	0	0
TOTAL LIABILITIES	$43,992,730	$30,782,841	$12,050,184	$1,046,366	$113,340

NORTH MARIN WATER DISTRICT
STATEMENT OF NET POSITION
FOR THE PERIOD ENDING DECEMBER 31, 2015

	TOTAL	NOVATO WATER	NOVATO RECYCLED	WEST MARIN WATER	OCEANA MARIN SEWER
Net Assets					
Invested in Capital Assets					
Contributions in Aid of Construction	$75,673,414	$68,754,839	$4,104,370	$2,136,140	$678,066
Grants in Aid of Construction	7,028,212	274,055	3,926,970	2,827,187	0
Connection Fees	31,955,447	25,328,033	4,928,747	1,221,771	476,895
Total Investment	$114,657,073	$94,356,927	$12,960,088	$6,185,098	$1,154,961
Restricted Reserves					
Connection Fee Fund	($4,230,131)	($4,368,639)	$0	$132,933	$5,575
Wohler Pipeline Financing Fund	400,193	400,193	0	0	0
Collector #6 Financing Fund	1,573,459	1,573,459	0	0	0
Revenue Bond Redemption Fund	30,000	0	0	30,000	0
Bank of Marin Project Fund	649,695	0	0	649,695	0
Deer Island RWF Replacement Fund	763,057	0	763,057	0	0
Capital Replacement & Expansion Fund	269,490	0	269,490	0	0
RWS North/South SRF Payment Fund	614,299	0	614,299	0	0
Designated Reserves					
Liability Contingency Fund	922,285	823,400	0	98,885	0
Maintenance Accrual Fund	4,165,681	4,165,681	0	0	0
Self-Insured Workers' Compensation Fund	568,131	534,601	9,377	17,984	6,169
Retiree Medical Benefits Fund	2,658,697	2,658,697	0	0	0
Conservation Incentive Rate Fund	40,204	0	0	40,204	0
Operating Reserve Fund	120,000	0	0	60,000	60,000
Earned Surplus - Prior Yrs	(33,219,016)	(28,216,106)	(3,646,310)	(1,332,284)	(24,316)
Net Income/(Loss)	463,269	474,294	(123,139)	100,015	12,099
Transfer (To)/From Reserves (see below)	1,217,576	1,214,712	(61,305)	64,708	(539)
Total Restricted & Designated	($22,993,112)	($20,739,709)	($2,174,531)	($137,860)	$58,987
TOTAL NET POSITION	$91,663,961	$73,617,218	$10,785,557	$6,047,238	$1,213,948
Transfer (To)/From Reserves					
Connection Fee	679,593	680,350	0	(757)	0
Maintenance Reserve	(50,000)	(50,000)	0	0	0
RWF Replacement Fund	(58,883)	0	(58,883)	0	0
Capital Replacement & Expansion Fund	(1,170)	0	(1,170)	0	0
Retiree Medical Insurance Fund	(15,044)	(15,044)	0	0	0
(Gain)/Loss Self-Insured WC Fund	(60,018)	(56,611)	(1,252)	(1,616)	(539)
Bank of Marin Project Fund	953,198	956,017	0	(2,819)	0
Conservation Incentive Rate Fund	1,237	0	0	1,237	0
Operating Reserve Fund	68,662	0	0	68,662	0
Total Transfer	$1,217,576	$1,214,712	($61,305)	$64,708	($539)

NORTH MARIN WATER DISTRICT
SOURCES AND USES OF FUNDS STATEMENT - ALL SERVICE AREAS COMBINED
FOR PERIOD ENDING DECEMBER 31, 2015

	YTD Actual	Annual Budget	YTD/ Budget %	Prior YTD Actual
OPERATING REVENUE				
Water Sales	$6,836,033	$15,000,000	46%	$7,556,081
Bimonthly Service Charge	2,165,919	4,335,000	50%	2,156,191
Sewer Service Charge	97,554	196,000	50%	93,432
Wheeling & Misc Service Charges	172,523	387,000	45%	196,468
TOTAL OPERATING REVENUE	$9,272,030	$19,918,000	47%	$10,002,171
OPERATING EXPENDITURES				
Source of Supply	$2,449,467	$5,110,000	48%	$2,973,941
Pumping	145,448	413,000	35%	180,190
Operations	376,104	695,000	54%	360,541
Water Treatment	948,228	2,130,000	45%	801,668
Sewer Service	85,233	136,000	63%	62,871
Transmission & Distribution	1,288,674	2,850,000	45%	1,337,604
Consumer Accounting	311,562	621,000	50%	289,112
Water Conservation	212,652	471,000	45%	199,740
General & Administrative	1,073,620	2,319,000	46%	811,369
TOTAL EXPENDITURES	1,647,217	3,404,000	48%	1,608,428
TOTAL OPERATING EXPENDITURES	$8,538,205	$18,149,000	47%	$8,625,463
NET OPERATING INCOME (LOSS)	$733,824	$1,769,000	41%	$1,376,708
NON-OPERATING REVENUE/(EXPENSE)				
Tax Proceeds	$51,099	$92,000	56%	$49,124
Interest Revenue	59,425	125,000	48%	58,835
Miscellaneous Revenue	98,170	87,000	113%	88,100
Bond & Loan Interest Expense	(408,582)	(826,000)	49%	(430,412)
Miscellaneous Expense	(70,668)	(123,000)	57%	(11,117)
TOTAL NON-OP REVENUE/(EXPENSE)	($270,556)	($645,000)	42%	($245,471)
NET INCOME/(LOSS)	$463,269	$1,124,000	41%	$1,131,237
OTHER SOURCES/(USES) OF FUNDS				
Add Depreciation Expense	$1,647,217	$3,404,000	48%	$1,608,428
Connection Fees	201,490	576,000	35%	791,600
Loan Proceeds	0	5,500,000	0%	0
Grant Proceeds	19,124	0	-	1,185,250
Caltrans AEEP Capital Contribution	2,359,979	2,740,000	86%	7,519,184
StoneTree RWF Loan Principal	102,460	206,000	50%	100,035
MMWD AEEP Capital Contribution	245,000	245,000	100%	245,000
Capital Equipment Expenditures	0	(199,000)	0%	(26,329)
Capital Improvement Projects	(4,319,229)	(13,065,000)	33%	(10,350,052)
Bond & Loan Principal Payments	(902,486)	(1,706,000)	53%	(883,290)
Change in Working Capital	(2,230,895)	0	-	(2,887,878)
TOTAL OTHER SOURCES/(USES)	($2,877,342)	($2,299,000)	125%	($2,698,052)
CASH INCREASE/(DECREASE)	($2,414,073)	($1,175,000)	205%	($1,566,815)

NORTH MARIN WATER DISTRICT
INCOME STATEMENT AND CASH FLOW BY SERVICE AREA
FOR PERIOD ENDING DECEMBER 31, 2015

SUMMARY INCOME STATEMENT	TOTAL	NOVATO WATER	NOVATO RECYCLED	WEST MARIN WATER	OCEANA MARIN SEWER
Operating Revenue	$9,272,030	$8,360,904	$422,319	$390,953	$97,854
Operating Expense	8,538,205	7,712,638	402,594	300,685	122,289
OPERATING INCOME/(LOSS)	$733,824	$648,266	$19,725	$90,268	($24,435)
Non-Operating Revenue/(Expense)	($479,249)	($173,972)	($142,864)	$9,747	$36,534
NET INCOME/(LOSS)	$463,269	$474,294	($123,139)	$100,015	$12,099
CAPITAL CONTRIBUTIONS					
Developer In-Kind Contributions	$219,831	$202,809	$0	$13,632	$3,390
Caltrans AEEP Capital Contributions	2,359,979	2,359,979	0	0	0
MMWD Capital Contribution	245,000	245,000	0	0	0
Connection Fees	201,490	177,800	0	0	23,690
FRC Transfer	0	(585,572)	585,572	0	0
CAPITAL CONTRIBUTIONS	$3,045,424	$2,419,140	$585,572	$13,632	$27,080
CHANGE IN NET POSITION	$3,508,693	$2,893,434	$462,432	$113,647	$39,179
Net Position June 30, 2015	96,290,239	78,855,268	10,322,968	5,940,356	1,171,647
Net Position December 31, 2015	$99,798,932	$81,748,702	$10,785,400	$6,054,003	$1,210,826

CASH FLOW STATEMENT					
Net Income/(Loss)	$463,269	$474,294	($123,139)	$100,015	$12,099
Add Depreciation	1,647,217	1,290,964	236,020	95,735	24,498
Cash Generated From Operations	$2,110,486	$1,765,258	$112,881	$195,750	$36,597
Other Sources (Uses) of Funds					
Connection Fee Revenue	$201,490	$177,800	$0	$0	$23,690
Loan Proceeds	0	0	0	0	0
Capital Assets Acquisition	(4,319,230)	(3,731,256)	(435,615)	(152,021)	(337)
Caltrans AEEP Capital Contribution	2,359,979	2,359,979	0	0	0
StoneTree RWF Loan Principal Pmts	102,460	0	102,460	0	0
MMWD AEEP Capital Contribution	245,000	245,000	0	0	0
Principal Paid on Debt	(902,486)	(529,350)	(341,374)	(31,762)	0
Consumer Receivables Decr (Incr)	899,249	648,050	209,696	30,317	11,185
Construction Advances (Decr) Incr	256	(1,872)	10,000	(7,872)	0
Other Assets/Liabilities Decr (Incr)	(1,552,198)	(1,504,598)	(38,483)	(9,077)	(40)
Trade Accounts Payable (Decr) Incr	(1,578,202)	(1,556,730)	(22,414)	0	943
Connection Fee Transfer	0	(585,572)	585,572	0	0
Total Other Sources (Uses)	($4,524,559)	($4,459,426)	$69,841	($170,415)	$35,441
Net Cash Provided (Used)	($2,414,073)	($2,694,168)	$182,722	$25,335	$72,038
MV Cash & Investments June 30, 2015	14,187,766	11,580,919	1,122,184	1,140,462	344,201
MV Cash & Investments Dec 31, 2015	$11,773,693	$8,886,751	$1,304,906	$1,165,797	$416,239

NOVATO WATER
DETAIL INCOME STATEMENT
FOR THE PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
OPERATING REVENUE				
Water Sales	$656,374	$6,157,039	45%	$6,870,315
Bill Adjustments	(13,444)	(32,102)	35%	(44,443)
Bimonthly Service Charges	344,537	2,067,219	50%	2,058,280
Account Turn-on Charges	5,587	40,780	57%	28,170
New Account Charges	610	4,900	61%	4,471
Returned Check Charges	108	675	68%	612
Hydrant Meter Up/Down Charges	0	200	7%	600
Backflow Service Charges	10,387	65,167	50%	63,494
Lab Service-Outside Clients	1,785	20,236	46%	25,982
Wheeling Charges - MMWD	7,285	36,790	31%	69,690
Regulation 15 Forfeiture	0	0	0%	0
TOTAL OPERATING REVENUE	$1,013,229	$8,360,904	46%	$9,077,170
TOTAL EXPENDITURES				
SOURCE OF SUPPLY				
Supervision & Engineering	$777	$4,054	21%	$5,030
Operating Expense - Source	457	5,312	48%	5,839
Maint/Monitoring of Dam	139	10,585	21%	2,409
Maint of Lake & Intakes	15	15	0%	71
Maint of Structures	0	0	0%	0
Maint of Watershed	(255)	12,082	50%	6,682
Water Quality Surveillance	248	1,239	7%	4,730
Fishery Maint	0	1,192	30%	213
Erosion Control	0	0	0%	0
Purchased Water	398,215	2,308,520	49%	2,843,057
SOURCE OF SUPPLY	$399,596	$2,342,999	48%	$2,868,030
PUMPING				
Operating Expense - Pumping	$0	$0	0%	$237
Maint of Structures & Grounds	1,859	10,278	26%	26,803
Maint of Pumping Equipment	995	5,567	8%	13,502
Electric Power	10,431	112,255	44%	123,656
PUMPING	$13,285	$128,100	35%	$164,198
OPERATIONS				
Supervision & Engineering	$24,580	$121,872	67%	$112,898
Operating Expense - Operations	27,671	143,228	56%	133,686
Maintenance Expense	2,761	13,110	16%	8,533
Telemetry Equipment/Controls Maint	8,541	25,817	36%	25,860
Leased Lines	1,624	9,362	55%	7,323
OPERATIONS	$65,178	$313,388	51%	$288,300

NOVATO WATER
DETAIL INCOME STATEMENT
FOR THE PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
WATER TREATMENT				
Supervision & Engineering	$11,856	$64,032	66%	$68,948
Operating Expense - Water Treatment	1,095	177,520	62%	114,316
Purification Chemicals	0	108,839	26%	49,238
Sludge Disposal	3,027	42,108	48%	32,044
Maint of Structures & Grounds	5,256	21,295	27%	24,066
Maint of Purification Equipment	16,433	74,583	53%	54,782
Electric Power	5,136	55,859	42%	48,215
Water Quality Programs	9,977	57,134	59%	53,727
Laboratory Direct Labor	31,719	167,888	45%	172,724
Lab Service-Outside Clients	1,347	20,707	30%	25,376
Water Quality Supervision	7,556	37,077	50%	34,322
Laboratory Supplies & Expense	11,605	43,524	60%	36,655
Customer Water Quality	4,560	23,555	36%	22,135
Lab Cost Distributed	(3,317)	(13,085)	59%	(12,625)
WATER TREATMENT	$106,249	$881,037	45%	$723,925
TRANSMISSION & DISTRIBUTION				
Supervision & Engineering	$43,892	$264,492	55%	$270,307
Maps & Records	17,807	44,259	32%	45,190
Operation of T&D System	12,538	58,075	34%	36,836
Facilities Location	7,255	46,137	53%	52,411
Safety: Construction & Engineering	10,544	20,707	33%	17,490
Customer Service Expense	19,249	90,187	52%	69,290
Flushing	0	101	0%	2,025
Storage Facilities Expense	10,827	47,482	39%	78,299
Cathodic Protection	307	8,394	35%	1,355
Maint of Valves/Regulators	10,343	44,385	21%	76,099
Maint of Mains	6,714	87,351	78%	87,465
Leak Detection - Mains	484	4,179	25%	4,516
Backflow Prevention Program	12,916	60,742	46%	77,227
Maint of Copper Services	12,505	59,290	33%	80,811
Maint of PB Service Lines	25,927	291,707	66%	226,298
Single Service Installations	(4,504)	3,183	-	8,126
Maint of Meters	12,027	49,351	37%	47,897
Detector Check Assembly Maint	9,168	44,395	59%	63,101
Maint of Hydrants	10,472	15,467	20%	10,852
TRANSMISSION & DISTRIBUTION	$218,470	$1,239,884	46%	$1,255,597
CONSUMER ACCOUNTING				
Meter Reading	$12,819	$73,397	42%	$69,769
Collection Expense - Labor	2,662	14,379	44%	10,516
Collection Expense - Agency	138	590	20%	1,109
Billing & Consumer Accounting	24,939	133,753	52%	130,031
Contract Billing	1,345	8,460	45%	8,542
Stationery, Supplies & Postage	4,617	29,509	56%	29,800
Credit Card Fees	1,680	12,874	56%	11,918
Lock Box Service	912	5,472	50%	4,560
Uncollectable Accounts	2,954	9,001	60%	7,805
Office Equipment Expense	7,149	19,164	91%	8,722
Distributed to West Marin (4.1%)	(1,685)	(8,615)	57%	(8,061)
CONSUMER ACCOUNTING	$57,531	$297,983	50%	$274,711

NOVATO WATER
DETAIL INCOME STATEMENT
FOR THE PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
WATER CONSERVATION				
Residential	$25,930	$182,158	53%	$160,759
Commercial	198	2,522	10%	2,763
Public Outreach/Information	533	15,444	31%	16,712
Large Landscape	925	8,751	29%	5,599
TOTAL WATER CONSERVATION	$27,585	$208,875	46%	$185,833
GENERAL AND ADMINISTRATIVE				
Directors Fees	$2,460	$15,990	50%	$14,000
Legal Fees	1,872	4,411	37%	5,643
Human Resources	1,981	11,545	36%	12,368
Auditing Fees	0	9,470	45%	18,380
Consulting Services/Studies	35,345	134,465	46%	6,914
General Office Salaries	102,193	604,503	41%	577,748
Safety: General District Wide	1,568	9,479	15%	3,825
Office Supplies	1,339	12,793	27%	12,371
Employee Events	4,996	9,263	77%	5,423
Other Administrative Expense	862	5,087	32%	6,326
Election Cost	0	0	0%	0
Dues & Subscriptions	5,838	46,700	82%	30,522
Vehicle Expense	865	4,245	53%	4,056
Meetings, Conferences & Training	17,432	76,025	41%	73,321
Recruitment Expense	75	574	29%	126
Gas & Electricity	2,153	16,672	54%	15,705
Telephone	582	3,573	60%	2,846
Water	340	1,129	56%	993
Buildings & Grounds Maint	10,225	28,155	55%	25,150
Office Equipment Expense	11,524	57,103	63%	42,230
Insurance Premiums & Claims	7,194	85,182	83%	43,448
Retiree Medical Benefits	14,602	88,252	51%	76,546
(Gain)/Loss on Overhead Charges	(42,337)	46,338	-66%	13,514
G&A Applied to Other Operations (5.9%)	(10,448)	(63,149)	37%	(50,643)
G&A Applied to Construction	(23,034)	(198,397)	52%	(181,329)
GENERAL & ADMINISTRATIVE	$147,627	$1,009,407	47%	$759,483
Depreciation (Note 4)	214,050	1,290,964	48%	1,268,646
TOTAL OPERATING EXPENSE	$1,249,572	$7,712,638	47%	$7,788,723
OPERATING INCOME/(LOSS)	($236,342)	$648,266	37%	$1,288,448

NOVATO WATER
DETAIL INCOME STATEMENT
FOR THE PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
NON-OPERATING REVENUE				
Interest:				
General Funds	$0	$0	-	$0
Wohler Pipeline Financing Fund	314	1,737	50%	1,237
Collector #6 Financing Fund	1,235	6,829	52%	4,866
Retiree Medical Insurance Fund	2,742	15,080	51%	10,421
Self-Insured Workers' Comp Fund	437	2,373	50%	1,433
Aqueduct Energy Efficiency Proj Fund	18	2,084	25%	10,802
Funds Held in County Treasury	0	112	2%	96
Total Interest Revenue	$4,746	$28,215	44%	$28,855
Rents & Leases	4,380	40,862	56%	59,506
Other Non-Operating Revenue	481	38,969	390%	30,378
Gain/(Loss) on MV of Investments	(1,296)	(11,113)	-	(6,584)
NON-OPERATING REVENUE	$8,311	$96,933	66%	$112,154
NON-OPERATING EXPENSE				
Bank of Marin AEEP Loan Interest Exp	$16,843	$102,048	48%	$106,713
STP SRF Loan Interest Expense	25,101	148,984	50%	157,848
Drought Loan Interest Expense	142	854	43%	1,252
Other Non-Operating Expense	(1,017)	19,019	95%	10,273
NON-OPERATING EXPENSE	$41,069	$270,905	51%	$276,086
NET INCOME/(LOSS)	($269,100)	$474,294	35%	$1,124,516
BEGINNING FUND EQUITY		$70,723,784		$67,238,946
NET INCOME/(LOSS)	(269,100)	474,294		1,124,516
CONTRIBUTED CAPITAL				
SCWA Prop 84 Water Conservation Grant	0	19,124	-	7,305
Developer 'In-Kind' Contributions	27,092	202,809	-	160,411
Caltrans AEEP Capital Contribution	234,044	2,359,979	86%	7,519,184
MMWD AEEP Capital Contribution	0	245,000	100%	245,000
Connection Fees	28,600	177,800	33%	753,600
FRC Transfer to Recycled Water	(233,316)	(585,572)	82%	(608,270)
ENDING FUND EQUITY		$73,617,218		$76,440,693

NOVATO RECYCLED WATER
DETAIL INCOME STATEMENT
FOR THE PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
OPERATING REVENUE				
Recycled Water Sales	$6,686	$407,986	54%	$407,694
Bimonthly Service Charges	2,154	14,312	51%	14,331
Account Turn-on Charges	0	20	-	0
Returned Check Charges	0	0	-	9
TOTAL OPERATING REVENUE	$8,840	$422,319	53%	$422,034
OPERATING EXPENSE				
SOURCE OF SUPPLY				
Purchased Water - NSD	($10,436)	$50,653	36%	$45,007
Purchased Water - LGVSD	1,088	41,917	54%	45,066
SOURCE OF SUPPLY	($9,347)	$92,570	43%	$90,072
PUMPING				
Maint of Structures & Grounds	$0	$0	0%	$91
Maint of Pumping Equipment	0	812	20%	895
Electric Power	213	1,475	49%	1,601
PUMPING	$213	$2,287	29%	$2,588
OPERATIONS				
Supervision & Engineering	$383	$3,716	31%	$3,307
Operating Expense - Operations	6	6,263	157%	3,971
Potable Water Consumed	9,288	26,783	268%	29,546
Maintenance Expense	0	254	5%	0
Telemetry Equipment/Controls Maint	600	3,678	41%	3,610
OPERATIONS	$10,276	$40,694	102%	$40,434
WATER TREATMENT				
Purification Chemicals	$0	$1,819	45%	$0
Maint of Structures & Grounds	0	0	-	297
Maint of Purification Equipment	0	570	9%	1,748
Electric Power	0	0	0%	0
Laboratory Direct Labor	0	675	11%	711
Lab Expense Distributed from Novato	12	454	15%	435
WATER TREATMENT	$12	$3,518	17%	$3,191
TRANSMISSION & DISTRIBUTION				
Supervision & Engineering	$417	$3,107	24%	$2,175
Operation of T&D System	(7,115)	0	0%	64
Cathodic Protection	0	0	0%	0
Storage Facilities Expense	0	462	15%	4,510
Maint of Valves/Regulators	0	0	0%	801
Backflow Prevention Program	0	0	0%	0
Maint of Meters	0	0	0%	537
Maint of Mains	0	540	-	18,736
TRANSMISSION & DISTRIBUTION	($6,698)	$4,109	13%	$26,822

NOVATO RECYCLED WATER
DETAIL INCOME STATEMENT
FOR THE PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
CONSUMER ACCOUNTING				
Distributed from Novato (3.6%)	$81	$416	42%	$386
CONSUMER ACCOUNTING	$81	$416	42%	$386
GENERAL AND ADMINISTRATIVE				
Distributed from Novato (1.6%)	$3,802	$22,980	40%	$18,991
GENERAL & ADMINISTRATIVE	$3,802	$22,980	40%	$18,991
Depreciation (Note 4)	39,337	236,020	50%	235,837
TOTAL OPERATING EXPENSE	$37,676	$402,594	47%	$418,321
OPERATING INCOME/(LOSS)	($28,837)	$19,725	(33%)	$3,713
NON-OPERATING REVENUE				
Interest:				
General Funds	$0	$0	0%	$309
RWF Replacement Fund	332	1,383	-	1,412
Capital Repl & Exp Fund	212	1,170	-	0
Self-Insured Workers' Comp Fund	8	43	-	20
StoneTree RWF Loan	3,736	22,826	52%	25,251
Total Interest Revenue	$4,288	$25,422	47%	$26,992
Other Non-Operating Revenue	0	16,368	-	284
NON-OPERATING REVENUE	$4,288	$41,790	77%	$27,276
NON-OPERATING EXPENSE				
RWF SRF Loan Interest Expense	$5,757	$34,169	50%	$36,599
Expansion SRF Loan Interest Expense	17,243	104,262	49%	108,393
Other Non-Operating Expense	14,958	46,224	154%	0
NON-OPERATING EXPENSE	$37,957	$184,655	60%	$144,991
NET INCOME/(LOSS)	($62,506)	($123,139)	39%	($114,002)
BEGINNING FUND EQUITY		$10,323,125		$8,618,143
NET INCOME/(LOSS)	(62,506)	(123,139)		(114,002)
FRC Transfer from Novato	233,316	585,572	82%	608,270
ENDING FUND EQUITY		$10,785,557		$9,112,410

WEST MARIN WATER
DETAIL INCOME STATEMENT
FOR PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
OPERATING REVENUE				
Water Sales	$32,590	$309,358	51%	$334,474
Bill Adjustments	(2,357)	(6,248)	-	(11,959)
Bimonthly Service Charges	14,206	84,387	51%	83,580
Account Turn-on Charges	166	557	56%	529
New Account Charges	30	120	12%	115
Returned Check Charges	0	18	-	36
Backflow Service Charges	916	2,760	55%	2,621
TOTAL OPERATING REVENUE	$45,550	$390,953	50%	$409,395
OPERATING EXPENSE				
SOURCE OF SUPPLY				
Supervision & Engineering	$121	$121	-	$0
Operating Expense	525	3,168	45%	1,662
Maint of Structures	0	7,600	63%	7,525
Water Quality Surveillance	339	3,007	60%	6,651
SOURCE OF SUPPLY	$985	$13,897	58%	$15,838
PUMPING				
Maint of Structures and Grounds	$22	$995	8%	$5,925
Maint of Pumping Equip	254	1,336	13%	455
Electric Power	1,351	12,730	85%	7,024
PUMPING	$1,627	$15,061	40%	$13,404
OPERATIONS				
Supervision & Engineering	$587	$5,908	66%	$2,643
Operating Expense	2,155	8,033	62%	14,301
Maint of Telemetry Equipment	1,159	4,433	25%	12,594
Leased Lines	449	3,648	61%	2,269
OPERATIONS	$4,350	$22,022	48%	$31,808
WATER TREATMENT				
Supervision & Engineering	$400	$2,604	37%	$485
Operating Expense	5,887	15,706	87%	14,135
Purification Chemicals	761	865	17%	1,454
Maint of Structures & Grounds	86	86	9%	2,350
Maint of Purification Equipment	1,124	4,705	28%	4,496
Electric Power	705	7,808	29%	13,350
Laboratory Direct Labor	3,609	17,251	58%	18,435
Laboratory Services	0	560	14%	3,233
Water Quality Supervision	0	767	19%	3,610
Customer Water Quality	44	1,729	35%	1,848
Lab Expense Distributed from Novato	2,664	11,593	72%	11,155
WATER TREATMENT	$15,278	$63,673	48%	$74,552

WEST MARIN WATER
DETAIL INCOME STATEMENT
FOR PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
TRANSMISSION & DISTRIBUTION				
Supervision & Engineering	$330	$3,500	22%	$6,891
Maps & Records	0	0	0%	2,756
Facilities Location - USA	341	1,841	37%	1,185
Customer Service Expense	174	4,415	29%	8,761
Flushing	0	0	0%	0
Storage Facilities Expense	1,905	6,033	29%	9,477
Cathodic Protection	165	672	13%	0
Maint of Valves	0	971	16%	829
Valve Operation Program	0	0	0%	0
Maint of Mains	0	4,966	99%	483
Maint of Backflow Devices	0	853	85%	484
Backflow Dev Inspection/Survey	1,124	2,865	48%	0
Maint of Copper Services	6,539	14,128	283%	3,471
Maint of PB Service Lines	(288)	3,463	31%	14,318
Maint of Meters	367	975	49%	235
Detector Check Assembly Maint	0	0	0%	2,290
Maint of Hydrants	0	0	0%	0
Hydrant Operation	0	0	0%	0
Single Service Installation	0	0	-	4,005
TRANSMISSION & DISTRIBUTION	$10,657	$44,681	37%	$55,184
CONSUMER ACCOUNTING				
Meter Reading	$616	$4,084	37%	$4,753
Collection Expense - Labor	0	266	13%	570
Uncollectable Accounts	0	273	-	676
Distributed from Novato (3.6%)	1,433	7,349	57%	6,807
CONSUMER ACCOUNTING	$2,049	$11,971	46%	$12,805
WATER CONSERVATION				
Water Conservation Program	$565	$3,777	18%	$13,907
TOTAL WATER CONSERVATION	$565	$3,777	18%	$13,907
GENERAL AND ADMINISTRATIVE				
Distributed from Novato (3.2%)	$4,941	$29,868	37%	$23,020
GENERAL & ADMINISTRATIVE	$4,941	$29,868	37%	$23,020
Depreciation (Note 4)	15,551	95,735	53%	78,295
TOTAL OPERATING EXPENSE	$56,003	$300,685	45%	$318,814
OPERATING INCOME/(LOSS)	($10,453)	$90,268	79%	$90,582

WEST MARIN WATER
DETAIL INCOME STATEMENT
FOR PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
NON-OPERATING REVENUE				
Interest - General Funds	$115	$585	-	$94
Interest - FRC	136	757	38%	478
Interest - Self-Insured WC Fund	15	81	-	0
Interest - Bank of Marin Project Fund	510	2,819	94%	1,464
Interest - CIR Fund	32	186	-	162
Rents & Leases	0	3,927	98%	3,941
Tax Proceeds - OL-2 G.O. Bond	147	147	-	44
Tax Proceeds - PR-2 Tax Allocation	24,218	24,514	54%	23,759
Other Non-Operating Revenue	0	102	-	75
NON-OPERATING REVENUE	$25,173	$33,119	61%	$30,018
NON-OPERATING EXPENSE				
Bank of Marin Loan Interest Expense	$2,472	$14,979	51%	$15,664
OL-2 G.O. Bond Interest Expense	0	0	-	99
PRE-1 Revenue Bond Interest Exp	254	1,525	51%	1,800
PR-6 Revenue Bond Interest Exp	275	1,650	47%	1,875
Drought Loan Interest Expense	18	111	28%	170
Other Non-Operating Expense	4,206	5,107	9%	320
NON-OPERATING EXPENSE	$7,226	$23,372	25%	$19,927
NET INCOME/(LOSS)	$7,495	$100,015	135%	$100,672
BEGINNING FUND EQUITY		$5,933,590		$4,166,170
NET INCOME/(LOSS)	7,495	100,015		100,672
CONTRIBUTED CAPITAL				
Prop 50 Gallagher Well Pipeline Grant	0	0	-	1,177,945
Developer 'In-Kind' Contributions	3,964	13,632	-	0
Connection Fees	0	0	0%	22,800
ENDING FUND EQUITY		$6,047,238		$5,467,588

OCEANA MARIN SEWER
DETAIL INCOME STATEMENT
FOR PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
OPERATING REVENUE				
Sewer Service Charges	$16,259	$97,554	50%	$93,432
Inspection Fees	300	300	-	140
TOTAL OPERATING REVENUE	$16,559	$97,854	50%	$93,572
OPERATING EXPENSE				
SEWAGE COLLECTION				
Supervision & Engineering	$1,363	$4,845	37%	$5,614
Inspection	0	0	0%	244
Maps & Records	0	0	-	14
Operating Expense	1,799	6,210	89%	3,173
Facilities Location	0	679	68%	1,007
Maint of Telemetry Equipment	0	2,634	132%	4,002
Sewer Service Installation	0	0	-	95
Maint of Lift Stations	477	11,823	169%	281
Maint of Manholes	0	0	0%	0
Maint of Sewer Mains	3,259	3,259	65%	0
Electric Power	754	5,338	59%	4,675
SEWAGE COLLECTION	$7,650	$34,788	71%	$19,106
SEWAGE TREATMENT				
Operating Expense	$805	$22,520	78%	$25,740
Treatment Supplies & Expense	0	0	0%	0
Maint of Structures	0	71	4%	9
Maint of Equipment	2	4,347	54%	1,034
Laboratory Direct Labor	939	1,545	26%	1,689
Lab Expense Distributed from Novato	641	1,038	52%	1,034
Electric Power	429	2,777	40%	3,424
SEWAGE TREATMENT	$2,816	$32,297	58%	$32,930
SEWAGE DISPOSAL				
Operating Expense	$1,332	$6,122	68%	$8,081
Operating Supplies & Expense	0	0	-	0
Maint of Pump Stations	366	5,780	64%	594
Maint of Storage Ponds	0	122	3%	244
Maint of Irrigation Field	2,622	6,124	68%	1,916
SEWAGE DISPOSAL	$4,321	$18,148	59%	$10,835
CONSUMER ACCOUNTING				
Collection Expense - County of Marin	$342	$342	-	$342
Distributed from Novato (0.5%)	$171	$850	43%	$868
CONSUMER ACCOUNTING	$513	$1,192	60%	$1,210
GENERAL AND ADMINISTRATIVE				
Distributed from Novato (1.0%)	$1,704	$10,301	36%	$8,632
Liability Insurance	177	1,063	53%	1,242
GENERAL AND ADMINISTRATIVE	$1,882	$11,365	37%	$9,875
Depreciation (Note 4)	3,949	24,498	47%	25,650
TOTAL OPERATING EXPENSE	$21,131	$122,289	55%	$99,606
OPERATING INCOME/(LOSS)	($4,572)	($24,435)	98%	($6,034)

OCEANA MARIN SEWER
DETAIL INCOME STATEMENT
FOR PERIOD ENDING DECEMBER 31, 2015

	DECEMBER 2015	YEAR TO DATE ACTUAL	YTD/ BUDGET%	PRIOR YTD ACTUAL
NON-OPERATING REVENUE				
Rents & Leases	$0	$500	-	$500
Interest - Connection Fee Reserve	0	0	-	0
Interest - General Funds	207	1,333	67%	772
Interest - Self Insured WC Fund	5	28	-	17
Tax Proceeds - OM-1/OM-3 Tax Alloc	26,122	26,437	56%	25,321
Annexation Fees	8,508	8,508	-	0
Other Non-Operating Revenue	0	46	-	0
NON-OPERATING REVENUE	$34,842	$36,852	75%	$26,610
NON-OPERATING EXPENSE				
Master Plan Update	$0	$0	0%	$182
Other Non-Operating Expense	318	318	-	343
NON-OPERATING EXPENSE	$318	$318	2%	$525
NET INCOME/(LOSS)	$29,952	$12,099	134%	$20,051
BEGINNING FUND EQUITY		$1,174,769		$1,074,018
NET INCOME/(LOSS)	29,952	12,099		20,051
CONTRIBUTED CAPITAL				
Contribution in Aid of Construction	415	3,390	-	0
Connection Fees	23,690	23,690	158%	15,200
ENDING FUND EQUITY		$1,213,948		$1,109,269

NORTH MARIN WATER DISTRICT
CONNECTION FEE ANALYSIS
FOR PERIOD ENDING DECEMBER 31, 2015

The Connection Fee (FRC) Fund is comprised of cash available from collection of Facility Reserve Charge Fees. The fee is charged to developers based upon the estimate of cost necessary to construct capacity to serve the new development. These funds are restricted by law for expansion of the water facilities within the service area where the new development occurs. Funds are disbursed from the Connection Fee Reserve as expenditures are incurred to increase system capacity to serve new development.

CONNECTION FEE FUND	TOTAL	NOVATO WATER	WEST MARIN WATER	OCEANA MARIN SEWER
Connection Fee Cash Balance 6/30/15	$176,345	$0	$176,345	$0
Add: funds borrowed to subsidize operations	($3,856,760)	($3,838,645)	$0	($18,115)
Connection Fee Reserve Balance 6/30/15	($3,680,415)	($3,838,645)	$176,345	($18,115)
Add: Connection Fees Collected FYTD	201,490	177,800	0	23,690
Interest Earned	757	0	757	0
Prior Period Adjustment	166,354	166,354		
Subtotal	($3,311,814)	($3,494,491)	$177,102	$5,575
Less: Fees Expended FYTD	311,473	267,305	44,169	0
Fees transferred to RWS FYTD (Note 13)	585,572	585,572	0	0
Connection Fee Reserve Balance 12/31/15	($4,208,859)	($4,347,367)	$132,933	$5,575
Less: Funds borrowed to subsidize operations	(4,347,367)	(4,347,367)	0	0
Less funds due from RWF	0	0	0	0
CONNECTION FEE CASH BALANCE 12/31/15	$138,508	$0	$132,933	$5,575

CONNECTION FEE EXPENTITURES FY16	TOTAL EXPENDITURE	% FUNDED BY CONNECTION FEES	TOTAL FUNDS FROM CONNECTION FEES
Novato Water			
Zone A Pressure Improvements	$34,088	50%	$17,044
Bank of Marin AEEP Debt Service	241,021	25%	60,255
Tank Access Hatch/Level Alarms	39,501	25%	9,875
STP Rehab SRF Loan Debt Service	523,452	25%	165,032
Lynwood PS-Motor Control Center Repl	4,650	25%	1,163
Water Conservation Expenditures	13,936	100%	13,936
	$856,648		$267,305
Recycled Water			
NBWRA Grant Program Administration	67,426	100%	$67,426
RW Expansion North Area Debt Service	185,739	100%	185,739
RW Expansion South Area Debt Service	332,407	100%	332,407
	$585,572		$585,572
West Marin			
Bank of Marin Debt Service	$35,379	25%	$8,845
Upsize 4" Pipe from Bear Valley Tank	141,295	25%	35,324
	$176,674		$44,169

Percentages shown represent % of total project cost paid by FRC funds, which are allocated to new growth based on historic NMWD practice. The amounts shown are FRC (connection fee) expenditures only, and do not include operations funding, which is also used to pay for these projects.

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NORTH MARIN WATER DISTRICT
ANALYSIS OF WORKER'S COMP, CONNECTION FEE AND CIR FUNDS
FOR PERIOD ENDING DECEMBER 31, 2015

WORKERS' COMPENSATION FUND	TOTAL	NOVATO WATER	WEST MARIN WATER	OCEANA MARIN SEWER	RECYCLED WATER
WC Cash Balance 6/30/15	$566,834	$532,786	$18,152	$6,299	$9,597
Less: Projected Prior FY Claims Liability	58,721	54,796	1,784	669	1,472
WC Reserve Balance 6/30/15	$508,113	$477,990	$16,368	$5,630	$8,125
Add: WC Expense Charged to Operations FYTD	106,068	98,643	3,500	1,167	2,758
Interest Earned	2,525	2,373	81	28	43
Subtotal	$616,706	$579,005	$19,950	$6,825	$10,926
Less: Claims Expense Paid	23,814	22,147	786	262	619
Excess Insurance Premium	29,760	27,677	982	327	774
Administration Fees	6,000	5,580	198	66	156
WC Reserve Balance 12/31/15	$557,132	$523,602	$17,984	$6,169	$9,377
Add: Projected Claims Liability	42,035	39,092	1,387	462	1,093
WC CASH BALANCE 12/31/15	$599,166	$562,694	$19,371	$6,632	$10,470

CONSERVATION INCENTIVE RATE FUND	TOTAL EXPENDITURES		
CIR Cash Balance 6/30/15	$41,441	$0	$41,441
Add funds borrowed to subsidize operations	0	0	0
CIR Reserve Balance 6/30/15	$41,441	$0	$41,441
Add: CIR Charges Billed FYTD	32,863	27,197	5,665
Regulation 15 Forfeitures	0	0	0
Interest Earned	186	0	186
Subtotal	$74,489	$27,197	$47,292
Less: CIR Funds Expended FYTD[1]	23,272	19,495	3,777
Bill Adjustments	11,013	7,702	3,311
CIR Reserve Balance 12/31/15	$40,205	$0	$40,204
Less funds borrowed to subsidize operations	0	0	0
CIR CASH BALANCE 12/31/15	$40,204	$0	$40,204

[1] On September 1, 2009 the Board authorized water conservation expenditures to be charged against the Conservation Incentive Rate Fund

NORTH MARIN WATER DISTRICT
EQUIPMENT EXPENDITURES
PERIOD ENDING DECEMBER 31, 2015

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	DECEMBER 2015	FYTD TOTAL	FY 15/16 BUDGET	(OVER) UNDER	Notes
1 CONSTRUCTION					
a. Fittings & Hose for Emergency Hose Trailer		$0	$6,000	$6,000	1
	$0	$0	$6,000	$6,000	
2 ENGINEERING					
a. Large Format Color Printer		$0	$12,000	$12,000	1
	$0	$0	$12,000	$12,000	
3 OPERATIONS/MAINTENANCE					
a. Tire Balancer		$0	$6,000	$6,000	1
	$0	$0	$6,000	$6,000	
4 VEHICLE & ROLLING EQUIPMENT EXPENDITURES					
a. 4 X 4 Backhoe (Diesel)		$0	$125,000	$125,000	1
b. 1/2 Ton Pickup w/Tool Box & Radio		0	25,000	25,000	1
c. 1/2 Ton Pickup w/Tool Box & Radio		0	25,000	25,000	1
	$0	$0	$175,000	$175,000	
TOTAL EQUIPMENT EXPENDITURES	$0	$0	$199,000	$199,000	

Notes:
(1) Replacement item.

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NORTH MARIN WATER DISTRICT
OVERHEAD ACCOUNT ANALYSIS
FOR PERIOD ENDING DECEMBER 31, 2015

	YEAR TO DATE ACTUAL	ANNUAL BUDGET	YTD/ BUDGET%	PRIOR YTD ACTUAL
Material Handling				
Material Overhead Recovered (15%)	$21,743	$111,000	20%	$27,688
Labor	$31,421	$90,000	35%	$31,660
Materials, Supplies & Expense	5,334	10,000	53%	7,396
Correction to Inventory Counts	2,865	0	-	(421)
Write-down of Obsolete Inventory	0	0	-	0
Depreciation	5,542	11,000	50%	1,561
	$45,161	$111,000	41%	$40,196
Net Material Handling Gain / (Loss)	($23,418)	$0	-	($12,508)
Construction Supplies				
Const Supplies Overhead Recovered (10%)	$110,656	$305,000	36%	$117,977
Labor	$37,826	$114,000	33%	$52,027
Materials, Supplies & Expense	44,426	90,000	49%	53,925
Small Tools	4,247	24,000	18%	12,609
Depreciation	1,860	4,000	46%	1,784
	$88,359	$232,000	38%	$120,345
Net Constr Supplies Gain / (Loss)	$22,297	$73,000	31%	($2,368)
Vehicle & Equipment				
Vehicle & Equipment Recovered[1]	$202,661	$320,000	63%	$196,393
Labor	$29,010	$104,000	28%	$32,174
Materials, Supplies & Expense	53,497	67,000	80%	34,995
Fuel	37,610	100,000	38%	55,399
Depreciation	63,246	135,000	47%	59,928
	$183,362	$406,000	45%	$182,496
Net Vehicle & Equip Gain / (Loss)	$19,299	($86,000)	-22%	$13,897
Payroll				
Overheaded Payroll Recovered	$3,465,665	$7,714,000	45%	$3,403,004
Salary Including Leave Time	$2,433,346	$5,082,000	48%	$2,282,871
Employer FICA & Medicare Tax	178,219	378,000	47%	169,684
Insurance[2]	477,042	1,122,000	43%	522,755
Retiree Medical	38,688	79,000	49%	33,750
CalPERS Retirement	464,108	982,000	47%	420,610
Unreconciled Difference	(61,222)			(14,131)
	$3,530,180	$7,643,000	46%	$3,415,539
Net Payroll Gain / (Loss)	($64,516)	$71,000 [3]		($12,535)
Total Overhead Gain / (Loss)	**($46,338)**	**$58,000**	**-80%**	**($13,514)**

[1] Vehicle & Equipment Recovered is the amount charged to projects and operations to recover the expense of owning and operating the asset. The recovery rate is $6/hr for vehicles 3/4-ton and under $11/hr for larger vehicles. An additional 50% is charged to developer projects to reflect the fair market value of the assed used.

[2] Insurance Includes Medical, Dental, Vision, Cafeteria, Life, & Workers' Compensation

[3] Projected gain on self-insured worker's compensation gives rise to the budgeted payroll gain.

NORTH MARIN WATER DISTRICT
EXPENDITURES BY CATEGORY
FOR PERIOD ENDING DECEMBER 31, 2015

	OPERATING EXPENSE	Novato	Recycled	West Marin	Oceana Marin	YTD Total	Annual Budget	YTD Budget %	Prior YTD Actual	% Change
1	Salaries & Benefits	$2,755,277	$16,051	$88,675	$38,988	$2,898,991	$6,466,000	45%	$2,844,826	1 %
2	Water Purchases	2,308,520	92,570	0	0	2,401,090	4,927,000	49%	2,933,129	-18 %
3	Depreciation	1,290,964	236,020	95,735	24,498	1,647,217	3,404,000	48%	1,608,428	2 %
4	Materials, Services & Supplies	697,318	29,072	34,173	31,912	792,474	1,675,000	47%	691,895	14 %
5	Electric Power	168,114	1,475	20,538	8,115	198,241	449,000	44%	206,169	-3 %
6	Chemicals	108,839	1,819	865	0	111,523	436,000	26%	50,692	120 %
7	Consulting Services/Studies	134,465	0	0	0	134,465	271,000	50%	6,914	1844 %
8	Vehicles and Equipment (Distrib)	127,787	813	7,312	3,740	139,653	260,000	54%	134,767	3 %
9	Tools & Supplies (Distrib)	81,580	923	3,927	2,821	89,251	179,000	53%	99,147	-9 %
10	Retiree Medical Expenses	88,252	0	0	0	88,252	174,000	51%	76,546	15 %
12	Insurance & Claims	85,182	0	0	1,063	86,245	160,000	54%	44,691	92 %
11	Water Conservation Rebates	60,947	0	650	0	61,597	105,000	59%	47,242	30 %
13	Office Supplies & Postage	42,302	0	0	0	42,302	100,000	42%	54,089	-21 %
14	Overhead Charges (Gain)/Loss	46,338	0	0	0	46,338	(70,000)	-66%	13,514	242 %
15	Distributed Costs (Lab,G&A,ConsAcctg)	(283,247)	23,850	48,810	11,152	(199,435)	(387,000)	52%	(182,362)	9 %
16	**Total Operating Expense**	$7,712,638	$402,594	$300,685	$122,289	$8,538,205	$18,149,000	47%	$8,629,685	-1 %
17	Interest Expense & Other*	270,905	184,655	23,372	318	479,249	949,000	51%	440,864	8 %
18	**Total Expense**	$7,983,543	$587,248	$324,056	$122,607	$9,017,454	$19,098,000	47%	$9,070,550	-0 %
	Warehouse, Shop & Yard									
19	Salaries & Benefits	$98,257	$0	$0	$0	$98,257	$308,000	32%	$110,228	-10 %
20	Materials, Services & Supplies	218,626	0	0	0	218,626	441,000	50%	157,198	39 %
21	Distributed Costs	(316,882)	0	0	0	(316,882)	(749,000)	42%	(267,425)	18 %
22	**Total W/H, Shop & Yard**	$0	$0	$0	$0	$0	$0	-	$0	-
	District Capital Outlay									
23	Salaries & Benefits	$202,658	$169,959	$47,509	$246	$420,372	$831,000	51%	$412,641	1 %
24	Equipment Expenditures	0	0	0	0	0	199,000	0%	26,329	-100 %
25	Debt Principal Payments	529,350	341,374	31,762	0	902,486	1,706,000	53%	883,290	2 %
26	Materials, Services & Supplies	3,528,598	265,656	104,512	91	3,898,857	12,234,000	32%	9,941,702	-60 %
27	**Total District Capital Outlay**	$4,260,606	$776,989	$183,784	$337	$5,221,716	$14,970,000	35%	$11,263,961	-53 %
	Developer Funded Projects									
28	Salaries & Benefits	$94,201	$0	$3,995	$2,475	$100,670	$209,000	48%	$61,887	62 %
29	Materials, Services & Supplies	116,721	0	9,638	916	127,274	98,000	130%	81,929	55 %
30	**Total Developer Projects**	$210,922	$0	$13,632	$3,390	$227,944	$307,000	74%	$143,816	58 %
31	**Total**	$12,455,071	$1,364,238	$521,472	$126,334	$14,467,114	$34,375,000	42%	$20,478,327	-29 %

*Includes Interfund Interest

NORTH MARIN WATER DISTRICT
VEHICLE FLEET ANALYSIS
FOR PERIOD ENDING DECEMBER 31, 2015

	Year	Description	Veh#	Assigned	Fiscal Year to Date Mileage	Expense [1]	Recovery [2]	Gain/(Loss)	Vehicle Cost per Mile Mileage	Life to Date	FYTD	FY15	FY14
1	1999	Dodge Ram 1500	32	Pool	2,041	$658	$702	$44	81,482	$0.44	$0.32	$0.39	$0.66
2	2002	Chev K1500 4x4	47	LeBrun	3,515	$1,940	$1,616	($325)	116,065	$0.37	$0.55	$0.53	$0.71
3	2003	Dodge Dakota 4x4	49	Stompe	3,167	$1,304	$1,732	$428	90,778	$0.42	$0.41	$0.38	$0.60
4	2003	Chev C1500	51	FSR	2,479	$864	$1,506	$642	121,530	$0.39	$0.35	$0.55	$0.51
5	2004	Chev C1500	53	Pool	3,351	$2,860	$3,645	$785	118,565	$0.46	$0.85	$0.40	$1.52
6	2004	Chev C1500 Xtra Cab	54	Pool	80	$4,672	$198	($4,474)	92,165	$0.45	-	$0.39	$0.62
7	2005	Honda Civic Hybrid	56	Engineering	889	$312	$510	$198	74,390	$0.24	$0.35	$0.29	$0.42
8	2005	Honda Civic Hybrid	57	Clark	6,685	$1,106	$2,490	$1,384	60,606	$0.24	$0.17	$0.58	$0.16
9	2005	Ford Ranger	58	Frazer	7,557	$1,956	$4,632	$2,676	123,013	$0.44	$0.26	$0.42	$0.64
10	2005	Ford Ranger	59	Bynum	3,900	$2,201	$4,275	$2,074	113,537	$0.47	$0.56	$0.65	$0.34
11	2006	Chev Colorado	501	Lab	4,928	$2,322	$3,812	$1,489	131,818	$0.38	$0.47	$0.42	$0.41
12	2007	Chev K2500 4x4	502	Corda, Joe	4,481	$4,294	$9,245	$4,951	83,056	$0.55	$0.96	$0.50	$0.52
13	2007	Chev Colorado	504	Roberto	5,879	$2,250	$8,654	$6,404	41,866	$0.46	$0.38	$0.71	$0.72
14	2008	Ford F250 4x4	505	Cilia	4,115	$2,625	$6,952	$4,327	81,171	$0.71	$0.64	$0.62	$0.91
15	2008	Ford F250 4x4	506	STP	4,956	$1,222	$3,795	$2,573	53,431	$0.78	$0.25	$0.96	$0.52
16	2008	Chev Colorado 4x4	509	Engineering	2,987	$2,025	$2,261	$236	89,639	$0.35	$0.68	$0.33	$0.41
17	2009	Toyota Prius Hybrid	510	Frazer	2,430	$435	$1,250	$814	93,655	$0.20	$0.18	$0.35	$0.15
18	2010	Ford F150 4x4	511	STP	3,921	$3,058	$2,871	($187)	56,043	$0.49	$0.78	$0.41	$0.68
19	2010	Ford F150	512	Kurfirst	5,886	$6,265	$5,155	($1,110)	81,987	$0.50	$1.06	$0.36	$0.59
20	2010	Ford F150	513	On-Call	4,826	$1,476	$1,885	$409	47,073	$0.47	$0.31	$0.41	$0.61
21	2012	Ford F250	515	Reed	5,511	$3,141	$10,641	$7,500	31,231	$0.65	$0.57	$0.66	$0.65
22	2012	Ford F250	516	Castellucci	6,247	$2,033	$8,954	$6,921	31,064	$0.53	$0.33	$0.48	$0.64
23	2014	Ford F150	517	Grisso	1,359	$786	$2,717	$1,931	5,339	$0.39	$0.58	$0.33	$0.26
24	2015	Ford F250 4x4	518	Kehoe, Chris	9,731	$2,433	$10,625	$8,192	27,650	$0.34	$0.25	$0.37	$0.91
25	2015	Ford Escape 4X4	520	Arendell	7,219	$3,043	$5,988	$2,945	7,839	$0.40	$0.42	$0.16	-
26	2015	Ford F150 4X4	521	Lemos	6,774	$3,544	$3,380	($164)	6,856	$0.54	$0.52	$1.95	-
		Total 3/4 Ton & Under			**114,914**	**$58,826**	**$109,490**	**$50,664**	**1,861,849**	**$0.43**	**$0.51**	**$0.46**	**$0.56**
1	1999	Ford F350 W/Svc Body	19	Pool	1,000	$2,798	$1,942	($856)	131,398	$0.77	$2.80	$1.05	$2.97
2	2002	Int'l 5 Yd Dump	44	Construction	2,348	$2,955	$8,426	$5,471	91,532	$1.60	$1.26	$1.49	$2.21
3	1999	Ford F550 3-Yd Dump [3]	52	Construction	2,395	$2,331	$6,776	$4,445	83,953	$0.96	$0.97	$1.22	$1.34
4	2006	Int'l 4300 Crew	503	Breit	2,242	$7,993	$9,218	$1,225	32,875	$2.68	$3.57	$2.69	$2.20
5	2008	Ford F350 4x4	507	Latanyszyn	7,634	$6,948	$7,870	$922	93,865	$0.81	$0.91	$0.63	$0.73
6	2009	Peterbilt 335 Crew	508	Ochoa	1,901	$1,571	$10,772	$9,201	24,172	$1.91	$0.83	$1.98	$2.20
7	2012	Int'l 5 Yd Dump	514	Rupp	3,152	$2,964	$8,775	$5,812	21,970	$1.48	$0.94	$1.24	$1.45
8	2015	Int'l 5 Yd Dump	519	Sjoblom	4,424	$3,558	$7,794	$4,236	13,002	$0.98	$0.80	$1.14	$0.64
		Total 1 Ton & Over			**25,096**	**$31,117**	**$61,572**	**$30,455**	**492,767**	**$1.18**	**$1.24**	**$1.24**	**$1.53**

[1] Expense amount shown excludes depreciation (approximately $100,000 for FY16).

2 Recovery is the amount charged to projects and operations to recover the expense of owning and operating the vehicle. Commencing 7/1/07 the recovery rate for vehicles 3/4-ton and under is $6/hr and the recovery rate for vehicles 1-ton and over is $11/hr. An additional 50% is charged to developer projects to reflect the fair market value of the vehicle being used.

[3] Purchased used in 2004 with 33,500 miles. Mileage shown is total incurred since District purchase.

NORTH MARIN WATER DISTRICT
WATER CONSERVATION PROGRAM DETAIL
FOR PERIOD ENDING DECEMBER 31, 2015

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		Description	COST THRU JUNE 2015	DECEMBER 2015	FYTD TOTAL	FY 15/16 BUDGET	(OVER) UNDER	TOTAL COST
		NOVATO						
		a. Residential						
1-7700-01	1-7700-26	1 Cash for Grass	$315,464	$3,634	$47,380	$58,000	$10,620	$362,844
1-7700-02	1-7700-27	2 Landscape Efficiency Rebates	21,118	176	743	7,000	6,257	21,861
1-7700-03		3 Fixtures Purchases	40,911	0	3,704	5,000	1,296	44,615
1-7700-06	1-7700-28	4 Washing Machine Rebates	336,990	664	3,916	20,000	16,084	340,906
1-7700-07		5 Demonstration Garden Improvements	54,377	39	39	1,000	961	54,416
1-7700-11	1-7700-29	6 Toilet Rebate SF	937,388	2,965	15,086	34,000	18,914	952,474
1-7700-12	1-7700-30	7 Toilet Rebate MF	18,173	0	0	4,000	4,000	18,173
1-7700-13		8 Residential Audits	293,840	40	5,331	50,000	44,669	299,171
1-7700-15		9 High Efficiency Toilet Distribution	238,006	1,229	3,895	0	(3,895)	241,901
1-7700-16		10 Water Waste Ordinance Monitoring	63,736	1,226	15,088	10,000	(5,088)	78,824
1-7700-17	1-7700-31	11 Swimming Pool Cover Rebate	1,589	0	950	2,000	1,050	2,539
1-7700-19	1-7700-32	12 ET Controller Rebate	28,777	0	1,230	8,000	6,770	30,007
1-7700-08		13 Administration	1,183,497	11,135	55,553	131,000	75,447	1,239,050
1-7700-20		14 New Development Wtr Cons Program	58,716	927	7,421	8,000	579	66,137
1-7700-21	1-7700-33	15 Demand Offset Rebate Program	2,425	0	122	2,000	1,878	2,547
1-7700-23		16 Grant Administration	1,838	0	276	1,000	724	2,114
1-7700-24	1-7700-34	17 Hot Water Recirculation Rebate	1,466	93	368	4,000	3,632	1,834
1-7700-25		18 Residential Fill Station	44,872	3,800	21,056	0	(21,056)	65,928
		b. Commercial						
1-7701-02	1-7701-05	1 Toilet Rebate Program	66,709	0	252	10,000	9,748	66,961
1-7701-03	1-7701-04	2 Commercial Audits	12,431	198	2,270	15,000	12,730	14,701
		c. Public Outreach/Information						
1-8672-16		1 Fall Newsletter	47,396	0	8,374	8,000	(374)	55,770
1-8672-17		2 Spring Newsletter	64,749	0	0	9,000	9,000	64,749
1-8672-18		3 Summer Newsletter	20,290	0	0	7,000	7,000	20,290
1-7700-04		4 Public Outreach / H_2O Fair	104,786	137	3,847	10,000	6,153	108,633
1-7700-05		5 Marketing	142,169	396	3,223	16,000	12,777	145,392
1-7700-22		6 Public Outreach/Leadership Novato	11,098	0	0	0	0	11,098
		d. Large Landscape						
1-8653-02		1 Large Landscape Audits	84,516	11	4,412	10,000	5,589	88,928
1-7702-01		2 Large Landscape Budgets	33,093	210	1,524	3,000	1,476	34,617
1-7702-02	1-7702-04	3 Large Landscape Irrig Efficiency Rebates	14,460	0	0	8,000	8,000	14,460
1-8653-01		4 CIMIS Station Maintenance	18,653	0	0	2,000	2,000	18,653
1-7702-03		6 Administration-Large Landscape	24,105	704	2,816	7,000	4,184	26,921
		TOTAL NOVATO WATER CONSERVATION	$4,287,638	$27,585	$208,875	$450,000	$241,125	$4,496,513
		WEST MARIN WATER						
2-5166-00		a. Water Conservation Program	$71,641	$565	$3,777	$22,000	$18,223	$75,418
		TOTAL WATER CONSERVATION EXPENDITURES[1]	$71,641	$565	$3,777	$22,000	$18,223	$75,418

[1]FY16 total excludes $317,000 (7,810 AF x $40.53) paid to SCWA for water conservation services provided to NMWD.

NORTH MARIN WATER DISTRICT
CAPITAL IMPROVEMENT PROJECTS
PERIOD ENDING DECEMBER 31, 2015

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	Description	COST THRU JUNE 2015	DECEMBER 2015	FYTD TOTAL	FY 15/16 BUDGET	(OVER)/UNDER BUDGET	TOTAL COST
	1 PIPELINE REPLACEMENTS/ADDITIONS						
	a. Main/Pipeline Replacements						
1-7067-20	1 So Novato Blvd-Rowland to Sunset (12"CI @ 1,000')	$253,409	$592	$210,173	$400,000	$189,827	$463,582
	b. Main/Pipeline Additions						
1-7145-00	1 Zone A Pressure Improvements - Ignacio	113,325	0	34,551	150,000	115,449	147,877
1-7150-00	2 San Mateo 24" Inlet/Outlet	15,291	0	0	150,000	150,000	15,291
	c. PB Service Line Replacements						
	1 Replace PB in Sync w/City Paving (30 Svcs)	0	0	0	70,000	70,000	0
1-7123-19	2 Grandview Ave (18 Svcs)	0	3,728	39,648	0	(39,648)	39,648
	d. Relocations to Sync w/City & County CIP						
	1 Other Relocations	0	0	0	80,000	80,000	0
	TOTAL PIPELINE REPLACEMENTS/ADDITIONS	$382,025	$4,320	$284,372	$850,000	$565,628	$666,397
	e. Aqueduct Replacements & Enhancements						
1-7118-01	1 MSN B1-Utility Agreement Costs[3]	$266,635	$653	($6,016)	$4,890,000	$4,896,016	$260,619
1-7118-02	2 MSN B2-Utility Agreement Costs[3]	35,183	3,145	23,163	0	(23,163)	58,346
1-7118-03	3 MSN B3-Utility Agreement Costs[3]	8,332,160	230,128	2,336,594	0	(2,336,594)	10,668,754
1-7118-04	4 AEEP Permit/Design/Construction[4]	5,674,419	39,432	979,372	0	(979,372)	6,653,791
1-7118-05	5 AEEP Legal Challenge/Litigation[4]	10,679	0	0	0	0	10,679
1-7118-07	6 MSN B1-Co-Op Agreement Costs[3]	421,623	149	6,239	0	(6,239)	427,862
1-7118-10	7 MSN B2/Gunn Ln-Utility Agreement Costs[3]	40,958	(30)	0	0	0	40,958
1-7118-17	8 AEEP B1 Betterment & Depreciation Cost[4]	411,164	0	0	0	0	411,164
1-7118-18	9 AEEP B2 Betterment & Depreciation Cost[4]	765	0	0	0	0	765
1-7118-21	10 AEEP-Reach B Tree Removal[4]	19,600	0	0	0	0	19,600
1-7118-22	11 Drain Existing Abandoned Aqueduct[5]	0	(15,446)	0	0	0	0
	TOTAL AQUEDUCT REPLACEMENTS AND ENHANCEMENTS	$15,213,186	$258,030	$3,339,351	$4,890,000	$1,550,649	$18,552,536
	2 SYSTEM IMPROVEMENTS						
1-7008-12	a. RTU Upgrades	$0	$784	$1,829	$15,000	$13,171	$1,829
1-8677-20	b. Flushing Taps at Dead-Ends (12 bienally)	0	1,030	2,206	50,000	47,794	2,206
1-7007-10	c. Detector Check Assembly Repair/Repl (~14/yr)	0	0	0	190,000	190,000	0
1-7090-02	d. Anode Installations (150/yr)	19,011	4,720	18,390	30,000	11,610	37,401
1-7132-02	e. Radio Expansion Telemetry Upgrades	0	7,570	7,570	25,000	17,430	7,570
1-7054-05	f. Inaccurate High Use Meter Replacement	4,542	0	0	10,000	10,000	4,542
1-7137-00	g. Backflow Device Upgrade-BMK (15 Svcs)	15,732	0	0	30,000	30,000	15,732
1-7146-00	h. Tank Access Hatch/Level Alarms (15 sites)	54,744	4,005	43,506	35,000	(8,506)	98,250
1-7157-00	i. Automate Zone Valve-Slowdown Ct	0	0	0	50,000	50,000	0
1-7158-00	j. Radio Read Meter Retrofit (Pilot Study/Install)	0	0	0	500,000	500,000	0
	TOTAL SYSTEM IMPROVEMENTS	$94,028	$18,109	$73,501	$935,000	$861,499	$167,529

NORTH MARIN WATER DISTRICT
CAPITAL IMPROVEMENT PROJECTS
PERIOD ENDING DECEMBER 31, 2015

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	Description	COST THRU JUNE 2015	DECEMBER 2015	FYTD TOTAL	FY 15/16 BUDGET	(OVER)/UNDER BUDGET	TOTAL COST
	3 BUILDINGS, YARD, & S.T.P. IMPROVEMENTS						
	a. Administration Building						
1-6501-43	1 Electronic Document Management System	$0	$0	$0	$150,000	$150,000	$0
1-6501-44	2 Office/Yard Building Refurbish	0	0	0	1,500,000	1,500,000	0
1-6501-45	3 Office HVAC	0	26,038	26,038	0	(26,038)	26,038
1-6501-46	4 Office Emergency Generator	0	0	0	150,000	150,000	0
	b. Stafford Treatment Plant						
1-6600-69	1 Stafford Dam Concrete Spillway Repair	75,346	0	0	50,000	50,000	75,346
1-6600-70	2 Watershed Erosion Control	46,154	0	0	25,000	25,000	46,154
1-6600-82	3 STP Emergency Power Generator	0	0	0	150,000	150,000	0
	TOTAL BUILDING, YARD, & STP IMPROVEMENTS	$121,500	$26,038	$26,038	$2,025,000	$1,998,962	$147,539
	4 STORAGE TANKS & PUMP STATIONS						
	a. Hydropnuematic Tank Repairs	$0	$0	$0	$60,000	$60,000	$0
1-6112-24	b. Lynwood Pump Station Motor Control Center	106,813	0	4,813	120,000	115,187	111,626
1-6222-23	c. Sunset Tank Cl2 Mixing System	23,240	1,251	3,180	90,000	86,820	26,421
1-6141-00	d. Crest P.S.(Design/Const)/Reloc School Rd P.S.	28,039	0	0	70,000	70,000	28,039
	TOTAL STORAGE TANKS & PUMP STATIONS	$158,092	$1,251	$7,993	$340,000	$332,007	$166,086
	5 RECYCLED WATER						
5-7127-00	a. NBWRA Grant Program Administration	$971,398	$1,143	$67,426	$80,000	$12,574	$1,038,825
5-6058-10	b. Expansion to Central Area[1]	212,607	32,051	355,237	3,500,000	3,144,763	567,844
5-6058-15	c. RW Central Row Costs	0	6,902	6,902	0	(6,902)	6,902
5-6058-20	d. RW Central Private Onsite Retrofit	0	200	5,200	0	(5,200)	5,200
5-6058-25	e. RW Central Public Onsite Retrofit	0	850	850	0	(850)	850
	f. Other Recycled Water Expenditures	0	0	0	100,000	100,000	0
	TOTAL RECYCLED WATER	$1,184,005	$41,145	$435,615	$3,680,000	$3,244,385	$1,619,620
	6 WEST MARIN WATER SYSTEM						
	System Improvements:						
2-7153-00	a. Upsize 4" Pipe from Bear Valley Tanks	$33,406	$12,612	$107,889	$100,000	($7,889)	$141,295
2-6257-20	b. PR Tank #2 & 3 Seismic Piping Upgrade	47,641	0	0	30,000	30,000	47,641
2-6263-20	c. Replace PRE Tank #4A (25K Gal w/82K Gal)	22,328	0	126	50,000	49,874	22,454
2-8650.xx	d. PB Replace in Sync w/County Paving	0	0	0	50,000	50,000	0
2-7160-00	e. Green Sand Filter Media Replace	0	0	0	75,000	75,000	0
2-6602-23	f. Replace Pump in Well #2	5,894	363	44,006	0	(44,006)	49,900
	TOTAL WEST MARIN WATER SYSTEM	$109,269	$12,974	$152,021	$305,000	$152,979	$261,290
	7 OCEANA MARIN SEWER SYSTEM						
8-8672-28	a. Infiltration Repair	$0	$0	$0	$40,000	$40,000	$0
8-7159-00	b. Force Main Repairs	0	337	337	0	(337)	337
	TOTAL OCEANA MARIN SEWER SYSTEM	$0	$337	$337	$40,000	$39,663	$337
	TOTAL PROJECT EXPENDITURES	$17,262,106	$362,205	$4,319,229	$13,065,000	$8,745,771	$21,581,335

NORTH MARIN WATER DISTRICT
CAPITAL IMPROVEMENT PROJECTS
PERIOD ENDING DECEMBER 31, 2015

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Description	COST THRU JUNE 2015	DECEMBER 2015	FYTD TOTAL	FY 15/16 BUDGET	(OVER)/UNDER BUDGET	TOTAL COST
8 LESS FUNDED BY GRANTS, LOANS & REIMBURSEMENTS						
(Accrued)/Deferred						
a. RW Expansion - Central Service Area SRF Loan[1]	($208,582)	($32,051)	($355,237)	$0	$355,237	($563,819)
b. MSN Aqueduct Caltrans Reimb-Segment B1-B3[2]	(640,152)	938,453	(1,141,076)	0	1,141,076	(1,781,228)
c. AEEP Segment B1-B3[2]	5,402,869	(39,432)	(979,372)	(1,873,000)	(893,628)	4,423,497
d. AEEP- B1 Construction[2]	(30,641)	(149)	(6,239)	0	6,239	(36,880)
e. MSN Aqueduct Caltrans Reimb-Segment B2 Gunn Dr[2]	(334)	30	0	0	0	(334)
f. MSN B3 Advance Tree Removal Costs[3]	(296,424)	0	0	0	0	(296,424)
FUNDING BY OTHERS (ACCRUED)/DEFERRED	$4,226,737	$866,852	($2,481,925)	($1,873,000)	$608,925	$1,744,812
Received						
a. RW Expansion - Central Service Area SRF Loan[1]	$0	$0	$0	($3,500,000)	($3,500,000)	$0
b. MSN Aqueduct Caltrans Reimb-Segment B1-B3[2]	(7,566,263)	(1,172,497)	(1,218,902)	(2,740,000)	(1,521,098)	(8,785,165)
c. AEEP Segment B1-B3[4]	(7,123,441)	0	0	0	0	(7,123,441)
d. AEEP- B1 Construction[2]	(421,545)	0	0	0	0	(421,545)
e. MSN Aqueduct Caltrans Reimb-Segment B2 Gunn Dr[2]	(40,958)	0	0	0	0	(40,958)
f. AEEP-B3 Tree Removal-CT Reimb[2]	0	0	0	0	0	0
FUNDING BY OTHERS RECEIVED	($15,152,207)	($1,172,497)	($1,218,902)	($6,240,000)	($5,021,098)	($16,371,110)
NET PROJECT EXPENDITURES	$6,336,635	$56,559	$618,402	$4,952,000	$4,333,599	$6,955,037

CIP SUMMARY-GROSS EXPENDITURES:	Current Month	FYTD Total	FY 15/16 Budget	FYTD/ Budget%
Novato Water Capital Projects	$307,748	$3,731,256	$9,040,000	41%
Novato Recycled Water Capital Projects	41,145	435,615	3,680,000	12%
West Marin Water Capital Projects	12,974	152,021	305,000	50%
Oceana Marin Sewer Capital Projects	337	337	40,000	1%
Gross Capital Improvement Project Outlays	$362,205	$4,319,229	$13,065,000	33%

CIP SUMMARY-NET EXPENDITURES:	Current Month	FYTD Total	FY 15/16 Budget	FYTD/ Budget%
Novato Water Capital Projects	$34,154	$385,666	$4,427,000	9%
Novato Recycled Water Capital Projects	9,094	80,378	180,000	45%
West Marin Water Capital Projects	12,974	152,021	305,000	50%
Oceana Marin Sewer Capital Projects	337	337	40,000	1%
Net Capital Improvement Project Outlays	$56,559	$618,402	$4,952,000	12%

Notes to Capital Improvement Projects Schedule:

(1) RW Expansion Costs for the Central Service Area will be funded by a Federal Title XVI grant of $1.5M and the remainder will be funded by a 1% interest rate State Revolving Fund Loan.

(2) Funding includes a $7M Bank Loan plus reimbursement from Caltrans for 100% of costs charged to jobs 1.7118.01-1.7118.03, 1.7118.07 & 1.7118.10.

(3) Funding provided 100% by Caltrans.

(4) Funding provided 100% by NMWD.

(5) Funding provided 100% by Ghilotti Brothers as a deductive change order.

NORTH MARIN WATER DISTRICT
CAPITAL IMPROVEMENT PROJECTS
PERIOD ENDING DECEMBER 31, 2015

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	Description	COST THRU JUNE 2015	DECEMBER 2015	FYTD TOTAL	FY 15/16 BUDGET	(OVER)/UNDER BUDGET	TOTAL COST
CONSULTING SERVICES/STUDIES							
1-7140-00	a. Stafford Dam Emergency Action Plan	$0	$0	$32,664	$40,000	$7,336	$32,664
1-6600-81	b. STP Taste & Odor Consultant	19,268	621	27,127	15,000	(12,127)	46,395
1-4048-00	c. Hydropnuematic Tank Inspections	0	0	0	50,000	50,000	0
1-4050-00	d. 2015 Urban Water Management Plan	10,797	278	24,007	10,000	(14,007)	34,804
1-4054-00	e. Insured Property Valuation Assessment	0	28,617	28,617	40,000	11,383	28,617
1-7126-00	f. Local Water Supply Enhancement Study	0	0	0	100,000	100,000	0
1-7060-00	g. Retiree Health Liability Actuarial Update	9,000	0	4,000	5,000	1,000	13,000
1-4055-00	h. Stafford Lake Sanitary Survey	0	0	0	30,000	30,000	0
5-4053-00	i. NMWD/NSD Central Srvc Area Expansion Study	0	11,133	29,016	30,000	984	29,016
5-4045-00	j. Recycled Water Engineering Report Update	4,509	3,825	17,208	0	(17,208)	21,717
2-4051-00	k. Gallagher Well #2 Hydrogeologic Study	0	3,908	27,828	58,000	30,172	27,828
		$43,574	$48,381	$190,466	$378,000	$187,534	$234,040

North Marin Water District Financial Statement Notes

Note 1 - Restricted Cash

Connection Fee Fund: Cash available from collection of Connection Fees. The fee is charged to developers based upon the estimate of cost necessary to construct capacity to serve the new development. These funds are restricted by law for expansion of the water or sewer facilities within the service area where the development occurs. Funds are disbursed from the Connection Fee Reserve as expenditures are incurred to increase system capacity to serve new development. The fund balance accrues interest monthly.

Wohler Pipeline Financing Fund: In December 2002 the Sonoma County Water Agency sold $6.8 million (par) of 30-year revenue bonds to finance the Wohler to Forestville Pipeline. NMWD's share of the debt is $844,050 ($6,800,000 X 11.2 / 90.4). In January 2003 the District established this designated cash and corresponding reserve account and transferred $844,050 of FRC money into the fund. The Wohler Pipeline Financing Fund is credited with interest monthly.

Collector #6 Financing Fund: The Sonoma County Water Agency received a $15.8 million State Revolving Fund loan commitment at an interest rate of 2.8% repayable over 20 years for construction of Collector #6. NMWD's share of Collector #6 is $1,950,000 ($15,800,000 X 11.2 / 90.4). In January 2003 the District established this designated cash and corresponding reserve account and transferred $1,950,000 of FRC money into the fund. The Collector #6 Financing Fund is credited with interest monthly.

Revenue Bond Redemption Fund: Comprised of one year of debt service as required by West Marin revenue bond covenants. These funds are restricted for payment of bond principal, interest and administration fees. The fund balance does not accrue interest.

Bank of Marin Project Fund: The District received an $8 million loan from the Bank of Marin in October 2011 to fund the Aqueduct Energy Efficiency Project. The 20-year, 3.54% annual percentage rate loan requires monthly payments of $46,067 and will be fully amortized on 10/27/31. In June 2012 the Board authorized reallocating $1 million of this loan to West Marin Water to repay Novato Water $223,000 owed for previous loans to fund Long Range Improvement Projects and the remainder to fund the Solids Handling Facility at the Point Reyes Water Treatment Plant. The unexpended fund balance accrues interest monthly.

Deer Island RWF Replacement Fund: The State Revolving Fund (SRF) loan agreement required the District to agree to establish and maintain a Water Recycling Capital Reserve Fund (WRCRF) for the expansion, major repair, or replacement of the Deer Island Recycled Water Treatment Plant. The WRCRF is maintained in compliance with the "Policy for Implementing the State Revolving fund for Construction of Wastewater Treatment Facilities" in effect at the time the agreement was signed by the District. The September 2003 Recycled Water Master Plan prepared by Nute Engineering recommended limiting the reserve to fund replacement of the RWF electrical and mechanical equipment (including transmission pumps) as they wear out. The cost of said equipment was $1,483,000 which, at Nute's recommended 6% interest rate factor and 25-year life, renders an annual funding requirement $115,000. The fund balance accrues interest monthly.

Recycled Water Capital Replacement and Expansion Fund: The 2011 Interagency Agreements for Recycled Water between NSD, LGVSD & NMWD require that any payments to the Distributor (NMWD) by the End User (Consumers) in excess of actual costs (marginal payments) shall be deposited in this fund. Operation and Maintenance Costs are defined as the actual cost of: labor (including general and administrative overhead plus tools and supplies normally applied), equipment and vehicle charges, consumables (such as chemicals and electrical power), and spare parts and/or replaced components necessary to reliably treat and deliver recycled water to the End Users. Operation and Maintenance Costs do not include costs for major capital replacement or process changes.

Tax Receipts held in Marin County Treasury: Balance of tax proceeds collected and disbursed by the County of Marin for repayment of the Olema (OL-2) general obligation bond debt. The County credits interest to these funds quarterly.

STP SRF Loan Fund – Marin County Treasury: The 2004 Stafford Treatment Plant State Revolving Fund (SRF) loan agreement requires the District to build a Reserve Fund equal to one year of payments ($1,044,474) in the Marin County Treasury during the first ten years of the 20-year repayment period. Every January 1 and July 1, commencing January 1, 2010, the District deposits with the County 10% of the semi-annual SRF payment. The County credits the fund with interest quarterly, and will use the Reserve to pay the last 2 semi-annual SRF loan payments.

RWS North/South SRF Payment Fund: The State Water Resource Control Board Agreements for the seven Clean Water State Revolving Fund Loans made for expansion of the Recycled Water System distribution system require that the District establish a reserve fund equal to one year's debt service ($614,299) prior to the construction completion date.

Note 2 - Designated Cash

Liability Contingency Fund: Established in 1986 when the District first elected to self-insure its general liability risk. This reserve was funded with $1 million initially and $200,000 annually thereafter until it reached a balance of $2 million. In FY98 the West Marin Water System was included in the fund and built-up a proportional reserve of $74,000 over several years. Commencing FY93, $1 million of the reserve was made available to fund loans to eligible employees under the District's Employer Assisted Housing Program. In August 2008, $500,000 was transferred into this reserve from the Self-Insured Workers' Compensation Fund and made available to fund Employer Assisted Housing Program loans. Currently there are $1,234,200 in Employer Assisted Housing Loans outstanding (see Note 3). In March 2005, $652,400 was expended from the fund to purchase a home at 25 Giacomini Road in Point Reyes Station. The home is rented to an employee who provides after-hours presence in the community to respond to emergencies. In 2006, $8,885 was added from the sale of surplus property in West Marin. The fund balance does not accrue interest.

Self-Insured Workers' Compensation Fund: Commencing July 2011, the District began self-insuring its workers' compensation liability. The savings accrued through self-insuring the liability is reserved in this fund for possible future claims expense. The District carries a workers' compensation excess policy for claims that exceed $750,000. See schedule on page 21.

Retiree Medical Benefits Fund: NMWD pays the cost of health insurance for retirees between the ages of 55 and 65 and spouse under any group plan offered by CalPERS. The retiree must be at least 55 and have a minimum of 12 years of NMWD service at the date of retirement. NMWD's contribution toward the chosen plan is capped in the same manner as all other NMWD employees in the same class. Coverage terminates for the spouse when the spouse becomes eligible for Medicare, or for both the retiree and spouse when the retiree becomes eligible for Medicare. When the retiree or spouse becomes eligible for Medicare, NMWD pays up to the couple annuitant rate, which is capped at $3,830 per year ($319/month). In August 2003, NMWD transferred $2.55 million ($2.3 million for current retirees plus $250,000 for future retirees) from unrestricted cash into a reserve to fund this obligation. In 2010 the Board directed staff to add $1,500 per employee annually as a payroll overhead to accrue and accelerate amortization of this liability. In 2013 an Actuarial Analysis calculated NMWD's total actuarial liability at $4.2 million. This reserve fund earns interest monthly, and currently has a balance of $3.3 million. Accounting Standards require that the $4.2M reserve by fully funded in 20 years.

Drought Contingency (Rate Stabilization) Fund: In August 2008, the Board directed staff to establish this reserve with $135,000 from the Self-Insured Workers' Compensation Fund for the Novato district to draw upon during dry years. A threshold of 3.2 billion gallons of potable consumption was established as a benchmark for 'normal' years. During any fiscal year that water sales volume exceeds 3.2BG, the incremental revenue generated is deposited into the Drought Contingency Reserve. In those years when sales volume falls below the benchmark, funds are withdrawn from the reserve to maintain the budgeted revenue forecast. The goal is to build a reserve equal to 20% (currently $2,500,000) of budgeted annual water commodity sales. In FY09 $50,335 was added to the reserve. The fund was fully depleted in FY10. The fund balance accrues interest monthly.

Maintenance Accrual Fund: Established in FY91 to provide a source of maintenance money for replacement of treatment, storage, transmission and distribution facilities as they wear out. The annual contribution from operating reserves was initially $200,000. Net polybutylene claim settlement proceeds

of $671,060 were closed into the fund in FY93. In FY94 the annual contribution was reduced to $100,000. The District's goal is to build a reserve equal to 10% of the net book value of Novato's existing plant, currently $7.0M. Funds are borrowed from the Maintenance Accrual Fund to offset the shortfall in unrestricted Cash & Investments. The fund balance does not accrue interest.

Conservation Incentive Rate Fund: In 2004 and 2005, a Conservation Incentive Tier Rate was enacted in Novato and West Marin respectively. Monies derived from this tier-rate charge are set aside in the Conservation Incentive Rate Reserve, and used for conservation programs designated by the Board. The fund balance accrues interest monthly.

Operating Reserve Fund: This reserve, comprised of four months of budgeted operating expenditures (less depreciation) as recommended by the District's financial advisors, serves to ensure adequate working capital for operating, capital, and unanticipated cash flow needs that arise during the year. The fund balance does not accrue interest.

Note 3 – Employee Loans

Housing Loans: The District's Employer Assisted Housing Program allows up to $300,000 to be loaned to an employee for a period of up to 15 years for the purchase of a home within the District service territory that will enable the employee to respond rapidly to emergencies affecting the operation of the District. Repayment is due upon sale, termination of employment, or other event as described in the Program. Interest on the loan is contingent upon and directly proportional to the appreciation in value occurring on the purchased property. There are seven employee-housing loans currently outstanding totaling $1,234,200: a $250,000 loan dated August 2004, a $39,200 loan dated September 2004, a $150,000 loan dated November 2007, a $245,000 loan dated June 2010, and a $250,000 loan dated March 2015.

Personal Computer Loans: Up to $3,500 may be loaned to an employee for a period of up to 36 months under the District's Personal Computer Loan Program. Loans are repaid with interest at the rate earned on the District's investment portfolio at the time of the loan plus one percent. Currently there is one employee loan outstanding totaling $37.

Note 4 – Depreciation

Assets are assigned a useful life based on consultations with the District Chief Engineer and a survey of other water agencies. Depreciation is computed on a straight-line basis over the estimated useful life of the various classes of property as follows:

Facility	Life (Years)
Aqueduct	150
Dam	100
STP & RWS Structures	40
STP & RWS Mains	50
STP & RWS Pumping Equipment	25
STP & RWS Water Treatment Equipment	20
Storage & Transmission Facilities	50
Distribution Facilities	50
Buildings	35
Office, Laboratory, Construction & Shop Tools & Equipment	10
Vehicles 1 ton or greater	10
All other vehicles	5
Sewer Mains	40
Sewer Pumps	10

Note 5 - Capitalization Policy

The Government Finance Officers Association *Guide for State and Local Governments* recommends that a capitalization policy incorporate a minimum threshold of $5,000 and an estimated useful life of at least two years. It also cautions that federal grant and loan requirements prevent the use of capitalization thresholds in excess of $5,000. Thus NMWD's capitalization threshold is $5,000.

Note 6 – Bond & Loan

Servicing Schedule for Fiscal Year 2015-2016

	Service Area	Description	Issue Date	Rate	Original Amount	Payment Due	Final Pmt	FY16 Interest Expense	FY16 Principal Paid	6/30/16 Outstanding Balance
1	Novato	EDA Loan	1977	5.0%	$351,770	7/1	7/1/17	$1,708	$15,909	$34,384
2	Novato	SRF Loan - STP	2004	2.39%	$16,528,850	7/1 & 1/1	7/1/29	$291,064	$753,410	$11,612,245
3	Novato	Bank of Marin Loan	2011	3.54%	$7,000,000	27th/mo	10/27/31	$201,703	$280,339	$5,702,962
							Novato Total	$494,475	$1,049,658	$17,349,591
4	RW TP	SRF Loan	2006	2.4%	$4,302,560	6/19	6/19/27	$67,709	$205,658	$2,615,529
5	RW North	SRF Loans (4)	2013	2.6%	$4,375,605	Varies	Varies	$99,530	$180,310	$3,726,692
6	RW South	SRF Loans (3)	2013	2.2%	$5,359,858	Varies	Varies	$110,416	$223,216	$4,737,899
							Recycled Water Total	$277,655	$609,184	$11,080,120
7	Point Reyes	EDA Loan	1977	5.0%	$46,000	7/1	7/1/17	$221	$2,364	$4,443
8	PRE	PRE-1 Revenue	1980	5.0%	$240,000	10/1 & 4/1	4/1/20	$3,113	$11,000	$51,000
9	Point Reyes	PR-6 Revenue	1981	5.0%	$217,800	7/1 & 1/1	7/1/21	$3,300	$9,000	$57,000
10	WM Water	Bank of Marin Loan	2012	3.54%	$1,000,000	27th/mo	10/27/31	$29,608	$41,156	$843,497
							West Marin Water Total	$36,242	$63,520	$955,940
							FY16 Total	$808,372	$1,722,362	$29,385,651

1. In 1977 the Federal Economic Development Administration issued a 40-year 5% loan of $351,770 to assist in the funding emergency Novato Water system projects in response to the drought.
2. In April 2004 the California State Department of Water Resources approved a 2.39% 20-year loan for reconstruction of the Stafford Water Treatment Plant. The project was completed in FY09 with repair of the Outlet Tower Sluice Gate. Interest paid during construction totaled $1,636,378. The loan covenants require an annual reserve fund contribution of $104,447 (10% of the annual debt service obligation) be deposited into the Marin County Treasury during each of the first ten years of the repayment period. Debt service is funded 25% by Facility Reserve Charges. The first payment was made in December 2009.
3. In October 2011 Bank of Marin made a 20-year 3.54% (APR) loan of $8 million to fund the District's share of the Aqueduct Energy Efficiency Project. See Note 15, and note to loan 11 below.
4. In August 2006 the California State Department of Water Resources approved a 2.4% 20-year loan of $4,264,545 for construction of the Deer Island Recycled Water Facility. With the addition of $38,015 in Construction Period Interest, the loan principal totaled $4,302,560. The project was completed in June 2007, and the first payment was made June 19, 2008.
5. In July 2011 the California State Department of Water Resources approved a series of four 2.6% 20-year loans which totaled $4,375,605 for the Recycled Water North Service Area Expansion Project. The projects were completed on October 31, 2012, and the first payment was made in November of 2012.

6. In March 2012 the California State Department of Water Resources approved a series of three 2.2% 20-year loans totaling $5,361,952 for the Recycled Water South Service Area Expansion Project. The projects were completed on September 4, 2013, and the first payment was made in December of 2013.

7. In 1977 the Federal Economic Development Administration issued a 40-year 5% loan of $46,000 to assist in the funding emergency West Marin Water system projects, including temporary diversions from Bear Valley Creek and Lagunitas Creek in response to the drought.

8. The Paradise Ranch Estates private water system was created by David Adams and Sons in 1952 to provide water to 85 homes in the PRE subdivision located north of Inverness Park. Problems with water quality and quantity developed and in 1969 the Marin County Health Department issued a boil-water order to all customers of the company. In 1972 the County declared a moratorium on issuance of building permits. A suit by property owners resulted in an agreement reached in Marin Superior Court in late 1978 directing Adams to finance a District feasibility study for the takeover of the system. This culminated in formation of Improvement District PRE-1 and an election authorizing issue of $240,000 of 5% 40-year revenue bonds, which, in conjunction with a $720,000 Farmers Home Administration grant, financed system rehabilitation. Service was provided from the Point Reyes System by installation of an additional well, expansion of the treatment plant, and a 6-inch pipeline connection at the Inverness Park pump station extending 1.6 miles along Sir Francis Drake Boulevard to the newly reconstructed Paradise Ranch Estates distribution system. On 4/22/80 the USDA purchased the revenue bond issue in its entirety.

9. In 1981 work commenced on rehabilitating the Point Reyes Inverness Park water system. 18,865 feet of pipeline was either replaced or installed, a 300,000-gallon tank was added in Point Reyes Station and a 100,000-gallon tank was added in Inverness Park. Total cost of these improvements was $820,015. A 72% grant combined with a $217,800 5% 40-year revenue bond acquired 8/28/81 by the Farmers Home Administration financed the project.

10. In June 2012 the Board authorized reallocating $1 million of the Bank of Marin loan to West Marin Water to repay Novato Water $223,000 owed for loans to fund Long Range Improvement Projects and the remainder to fund the Solids Handling Facility at the Point Reyes Water Treatment Plant. See note to loan 3 above.

Note 7 – Unemployment Insurance Reserve

NMWD uses the "Reimbursable Method" of paying for Unemployment Costs. Under this method, the District reimburses the State Employment Development Department for all unemployment benefits paid on our behalf. The reserve is maintained at an amount equal to the higher of the average claim amount paid over the last 5 years or 52 times the maximum weekly benefit amount (currently $450 x 52 = $23,400).

Note 8 – Payroll Benefits

Payroll Benefits payable includes payroll taxes; vacation, sick, and holiday leave; Section 125 payments; cancer, long term care and disability insurance premiums; union dues; and employee benefit fund.

Note 9 - Interest Policy on Inter-District Loans

In the event an improvement district expends all of its Undesignated Funds, it shall borrow funds from that improvement district's Board Designated Fund reserves to meet ongoing requirements. In the event an improvement district expends all of its Board Designated Fund reserves, it may receive a loan from the Novato Improvement District in an amount sufficient to meet its ongoing requirements. Restricted Funds shall not be used to finance ongoing normal operating expenses.

No interest shall be paid by an improvement district on funds borrowed from that improvement district's Board Designated Fund reserves. Interest on loans from the Novato Improvement District shall be paid by the recipient district to the Novato district based upon the outstanding loan balance at the close of the previous accounting period. Interest shall be calculated at the higher of: 1. The weighted average interest rate of Novato improvement district debt (2.77% at 6/30/15); or 2.The average interest rate earned on the District treasury since the close of the previous accounting period; plus $50 per month.

Note 10 – Budget Augmentations

Note 11 – Prior Period Adjustment

Note 12 – Explanation of Financial Statement Components

The District's financial statement is comprised of four components: 1) Statement of Net Position, 2) Sources and Uses of Funds Statement – All Service Areas Combined, 3) Income Statement and Cash Flow by Service Area, and 4) Notes to the Financial Statements. This report also contains other supplementary information in addition to the basic financial statements themselves.

The Statement of Net Position (page 4) reports the District's assets and liabilities and provides information about the nature and amount of investments in resources (assets) and the obligations to the District's creditors (liabilities). The difference between assets and liabilities is reported as *net position.* Over time, increases or decreases in the fund balance may serve as a useful indicator of whether the financial position of the District is improving or deteriorating.

The Sources and Uses of Funds Statement – All Service Areas Combined (page 8) compares fiscal year-to-date performance against the Board approved annual budget – presented in the adopted budget format. This Sources and Uses of Funds Statement varies from the income statement in that it includes capital expenditures, debt principal repayment, connection fee revenue, and cash infusions from debt issuance.

The Income Statement and Cash Flow by Service Area (page 9) presents the net income (loss) for the fiscal year-to-date (FYTD) period for each of the District's four service areas. The income and expenses on this report are presented in conformity with Generally Accepted Accounting Principles (GAAP) and comply with Governmental Accounting Standards Board pronouncements. Accordingly, all income and expenses are reported as soon as the underlying event giving rise to the change occurs, regardless of the timing of related cash flows. This statement measures the success of each service area's operations and can be used to determine whether the service area has successfully recovered all costs through user fees and other charges.

Also included at the bottom of page 9 is a statement of Cash Flow by Service Area. The primary purpose of this statement is to reconcile in an informative manner the difference between the net income/(loss) for the period of each service area with the resultant change in cash balance that occurred over the same period.

Notes to the Financial Statements (page 31) provide a summary of significant accounting policies and assumptions and other information of value to the financial statement reader.

Other Supplementary Information includes Detail Income Statements presented in accordance with GAAP for each of the four service areas (pages 10, 14, 16, 19). These statements present income and expenditures in close detail for further analysis. Other supplementary schedules of note include the Vehicle Fleet Analysis (page 25), Equipment Expenditures (page 22) and Capital Improvement Project Expenditures (page 27), which show outlays to date, compared with budget authority.

Note 13 –Connection Fee Transfers from Novato Water To Recycled Water

The following Connection Fee (FRC) reserve amounts have been transferred to the Recycled Water fund:

	Expansion Local Share			SRF RWF Expansion				Transfer
	North	South	Central	NBWRA	Loan	SRF Loan	Total	Executed
FY07				$29,725			$29,725	
FY08				$50,478	$22,795		$73,273	
FY09				$150,455	$22,795		$173,250	
FY10	$133,659			$75,198	$22,795		$231,652	$133,659
FY11				$133,319	$22,795		$156,114	
FY12	$233,478	$265,500		$115,883	$22,795		$637,656	
FY13				$315,023	$22,795	$464,572	$802,390	$1,970,400
FY14	$236,291	$723,525	$4,024	$63,035	$22,795	$500,529	$1,550,200	$1,550,200
FY15		$17,563	($4,024)	$38,283	$22,795	$614,299	$688,916	$688,916
FY16	$0	$0	$0	$67,426	$0	$518,146	$585,572	$585,572
	$603,428	**$1,006,589**	**$0**	**$1,038,826**	**$182,359**	**$2,097,546**	**$4,928,748**	**$4,928,747**

Note 14 –Debt Service Coverage Ratio

Debt Service Coverage Ratio is the ratio of net income/(loss) plus interest expense, depreciation, and connection fee revenue for the fiscal year to the sum of the fiscal year's principal and interest payments on the District's total debt.

	FY12	FY13	FY14	FY15	FY16 Budgeted
Net Income/(Loss)	($217,163)	$2,036,943	$3,815,820	$1,050,523	$1,124,000
Depreciation	$2,726,598	$2,784,648	$3,128,302	$3,183,725	$3,404,000
Interest Expense	$654,484	$778,762	$830,830	$847,951	$826,000
Connection Fees	$1,005,680	$876,350	$152,800	$801,600	$576,000
Total Available For Debt Service	$4,169,599	$6,476,703	$7,927,751	$5,883,799	$5,930,000
Annual Debt Service	$1,770,894	$2,118,314	$2,448,968	$2,534,473	$2,532,000
Debt Service Coverage Ratio	**2.35**	**3.06**	**3.24**	**2.32**	**2.34**

Bank of Marin Debt Service Coverage Calculation[1]	FY12	FY13	FY14	FY15	FY16 Budgeted
Change in Net Assets[2]		$5,035,889	$1,999,996	$13,177,468	$4,700,000
Interest Expense		$778,762	$830,830	$847,951	$826,000
Depreciation & Amortization		$2,784,670	$3,128,302	$3,183,725	$3,404,000
Total Available for Debt Service		$11,598,266	$5,959,128	$18,395,993	$8,930,000
Bank of Marin Annual Debt Service		$552,800	$552,800	$552,800	$552,800
Bank of Marin Coverage Ratio		**20.98**	**10.78**	**33.28**	**16.15**

[1] Per the October 27, 2011 Bank of Marin loan agreement, each June 30, beginning June 30, 2012, the Debt Service Coverage Ratio shall not be less than 1.2 to 1. "Debt Service Coverage Ratio" shall mean the ratio of (i) Borrower's change in net assets plus interest, depreciation, and amortization during the fiscal-year period ending on the Determination Date to the sum of the scheduled principal and interest payments on the Loan during the twelve-month period following the Determination Date.

[2] See page 9

Note 15 – Deferred Inflow and Deferred Outflow of Resources

Deferred Inflow of Resources is the net difference between projected and actual earnings on pension plan investments, which for FY14 was $2,182,010 and is recognized in FY15. Deferred Outflow of Resources is the fiscal year 2015 pension expense ($669,066) adjusted by the change in employer's proportion of differences between the employer's contributions and the employer's proportionate share of contributions from the CalPERS Actuarial Report ($88,134) for a total of $757,200 at June 30, 2015

6

NORTH MARIN WATER DISTRICT
MONTHLY PROGRESS REPORT FOR ***December 2015***
January 19, 2016

1.

Novato Potable Water Prod - RR & STP Combined - in Million Gallons - FYTD

Month	*FY15/16*	*FY14/15*	*FY13/14*	*FY12/13*	*FY11/12*	*16 vs 15 %*
July	252	319	385	389	371	-21%
August	274	301	360	396	373	-9%
September	213	276	332	346	347	-23%
October	243	221	313	283	249	10%
November	167	173	229	166	183	-3%
December	136	129	182	146	156	5%
FYTD Total	1,286	1,419	1,800	1,726	1,679	-9%

West Marin Potable Water Production - in Million Gallons - FY to Date

Month	*FY15/16*	*FY14/15*	*FY13/14*	*FY12/13*	*FY11/12*	*16 vs 15 %*
July	6.6	8.6	9.3	9.8	9.2	-23%
August	7.0	8.5	9.3	9.7	9.4	-18%
September	6.4	7.8	8.5	8.3	8.7	-18%
October	6.5	5.4	8.0	7.4	6.5	21%
November	4.7	4.6	6.8	5.2	5.1	4%
December	3.9	4.7	6.4	4.5	4.9	-16%
FYTD Total	35.2	39.5	48.3	44.9	44.0	-11%

Stafford Treatment Plant Production - in Million Gallons - FY to Date

Month	*FY15/16*	*FY14/15*	*FY13/14*	*FY12/13*	*FY11/12*	*16 vs 15 %*
July	108	83	98	49	115	30%
August	79	61	83	83	126	29%
September	38	26	56	72	77	46%
October	50	0	82	88	113	-
November	58	8	5	64	106	672%
December	0	0	2	0	49	-
FYTD Total	333	178	326	355	586	87%

Recycled Water Production - in Million Gallons - FY to Date

Month	*FY15/16*	*FY14/15*	*FY13/14*	*FY12/13*	*FY11/12*	*16 vs 15 %*
July	21.3	21.8	27.6	11.2	11.0	-2%
August	26.2	26.0	26.2	10.5	12.2	1%
September	15.7	19.2	18.6	8.5	9.6	-18%
October	15.8	9.4	15.8	0.0	0.0	69%
November	3.2	3.7	6.4	0.0	0.0	-14%
December	0.8	1.6	1.6	0.0	0.0	-51%
FYTD Total*	83.0	81.6	96.1	30.2	32.8	2%

*Excludes potable water input into the RW system: FYTD16 = 6.9MG; FYTD15 = 6.9MG; FYTD14 = 5.3MG.

2. Stafford Lake Data

	December Average	December 2014	December 2015
Rainfall this month	5.3 Inches	15.6 Inches	5.7 Inches
Rainfall this FY to date	9.9 Inches	20.5 Inches	6.8 Inches
Lake elevation*	184.1 Feet	196.2 Feet	181.1 Feet
Lake storage**	645 MG	1,408 MG	509 MG

* Spillway elevation is 196.0 feet

** Lake storage less 390 MG = quantity available for delivery

Temperature (in degrees)

	Minimum	Maximum	Average
December 2014 (Novato)	50	62	56
December 2015 (Novato)	43	59	51

3. Number of Services

December 31	Novato Water			Recycled Water			West Marin Water			Oceana Marin Swr		
	FY16	FY15	Incr %	FY16	FY15	Incr %	FY16	FY15	Incr %	FY16	FY15	Incr %
Total meters	20,759	20,748	0.1%	48	48	0.0%	785	821	-4.4%	-	-	-
Total meters active	20,524	20,498	0.1%	44	44	0.0%	778	777	0.1%	-	-	-
Active dwelling units	23,981	23,948	0.1%	0	0	-	825	823	0.2%	229	229	0.0%

4. Oceana Marin Monthly Status Report (December)

Description	December 2014	December 2015
Effluent Flow Volume (MG)	1.04	0.459
Irrigation Field Discharge (MG)	0	0.900
Treatment Pond Freeboard (ft)	2.4	6.1
Storage Pond Freeboard (ft)	4.7	5.7

5. Developer Projects Status Report (December)

Job No.	Project	% Complete	% This month
1.2774.00	Mt. Burdell Place	65	15
1.2768.00	OMA Village Water Facilities	96	1
1.2778.00	Novato Shell Loop	97	1
1.2782.00	33 Commerical Blvd.	97	1
1.2783.00	Olive Ave. Chevron Car Wash	70	60

District Projects Status Report - Const Dept (December)

Job No.	Project	% Complete	% This month
1.7067.00	S. Novato Blvd- Rowland to Sunset 12" R/R	100	1
2.7153.00	Upsize 4" pipe from Bear Valley Tanks	100	2
2.6602.23	PR Well No. 2 Replacement	90	5
1.7123.19	Grandview PB Replacement	98	8

Employee Hours to Date, FY 15/16

As of Pay Period Ending December 31, 2015
Percent of Fiscal Year Passed = 50%

Developer Projects	Actual	Budget	% YTD Budget	District Projects	Actual	Budget	% YTD Budget
Construction	983	1,400	70	Construction	2,265	4,949	46
Engineering	478	1,480	32	Engineering	2,428	4,980	49

6. Safety/Liability

	Industrial Injury with Lost Time				Liability Claims Paid	
	Lost Days	OH Cost of Lost Days ($)	No. of Emp. Involved	No. of Incidents	Incurred (FYTD)	Paid (FYTD) ($)
FY 16 through December	0	0	0	0	3	42,874
FY 15 through December	126	63,504	1	0	2	2,174

Days without a lost time accident through December 31, 2015= 213 days

7. Energy Cost

	December			*Fiscal Year-to-Date thru December*		
FYE	*Kwh*	*¢/Kwh*	*Cost/Day*	*Kwh*	*¢/Kwh*	*Cost/Day*
2016 Stafford TP	27,454	18.7¢	$166	317,219	18.4¢	$317
Pumping	66,616	16.0¢	$367	650,145	17.5¢	$632
Other*	34,508	18.5¢	$220	237,215	23.7¢	$312
	128,578	17.2¢	$739	1,204,579	18.9¢	$1,261
2015 Stafford TP	23,430	18.1¢	$137	332,769	17.7¢	$321
Pumping	67,508	15.7¢	$342	752,631	16.6¢	$688
Other*	35,482	18.1¢	$214	242,881	22.2¢	$296
	126,420	16.8¢	$708	1,328,281	17.9¢	$1,309
2014 Stafford TP	47,076	17.1¢	$259	366,511	17.1¢	$340
Pumping	94,036	14.4¢	$424	944,458	15.7¢	$814
Other*	42,735	16.4¢	$220	278,958	20.6¢	$315
	183,846	15.6¢	$868	1,589,927	16.9¢	$1,465

*Other includes West Marin Facilities

8. Water Conservation Update

	Month of December 2015	Fiscal Year to Date	Program Total to Date
High Efficiency Toilet (HET) Rebate ($100 each)	27	148	3,419
Retrofit Certificates Filed	21	116	5,433
Cash for Grass Rebates Paid Out	9	104	798
Washing Machine Rebates	10	63	6,662
Water Smart Home Survey	26	137	2,257

9. Utility Performance Metric

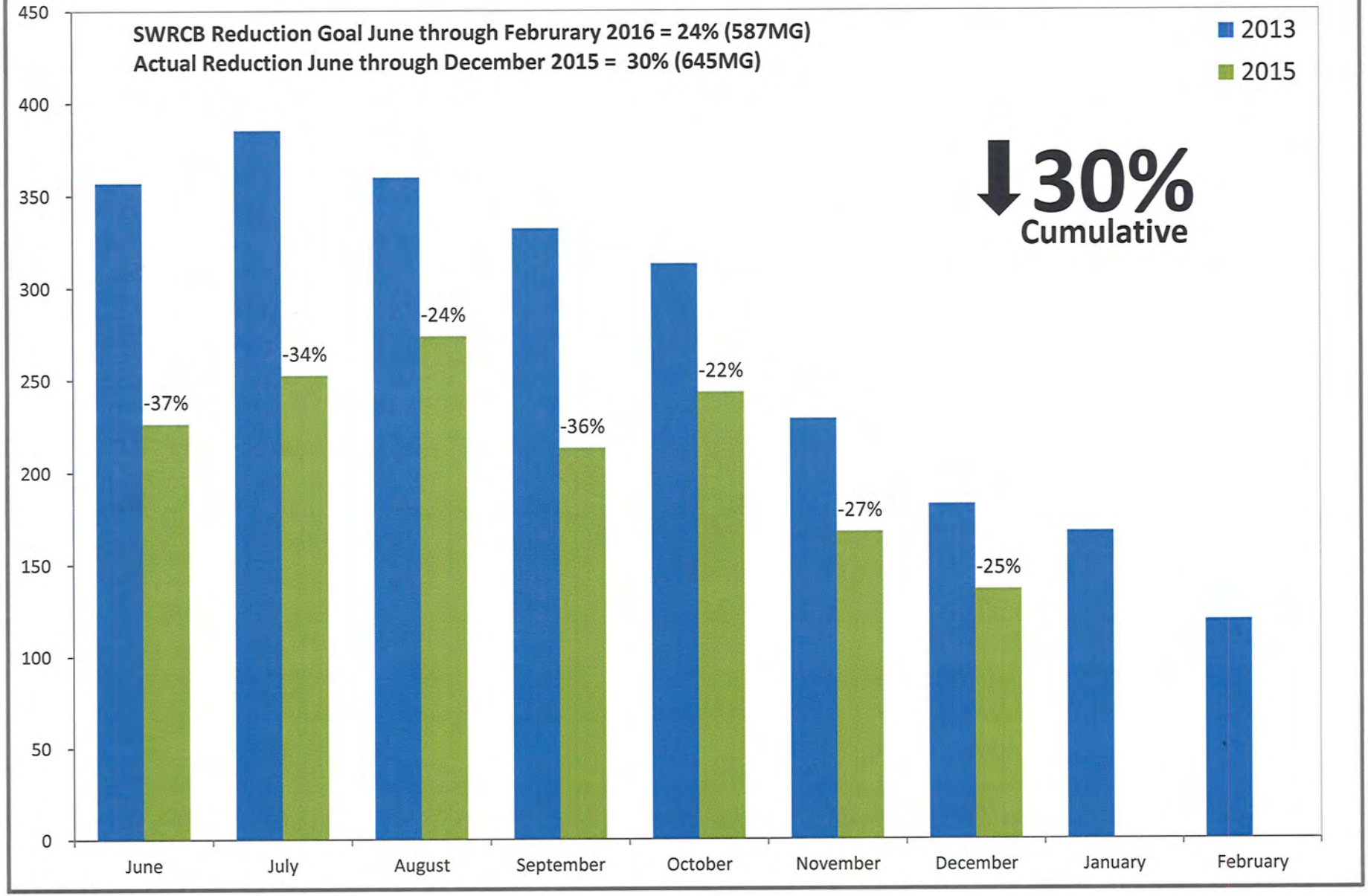
SERVICE DISRUPTIONS	December 2015 No. of Customers Impacted	December 2014 No. of Customers Impacted
PLANNED		
Duration Between 0.5 and 4 hours	6	8
Duration Between 4 and 12 hours		
Duration Greater than 12 hours		
UNPLANNED		
Duration Between 0.5 and 4 hours	7	9
Duration Between 4 and 12 hours		
Duration Greater than 12 hours		
SERVICE LINES REPLACED	**December 2015**	**December 2014**
Polybutylene	8	8
Copper (Replaced or Repaired)	2	1

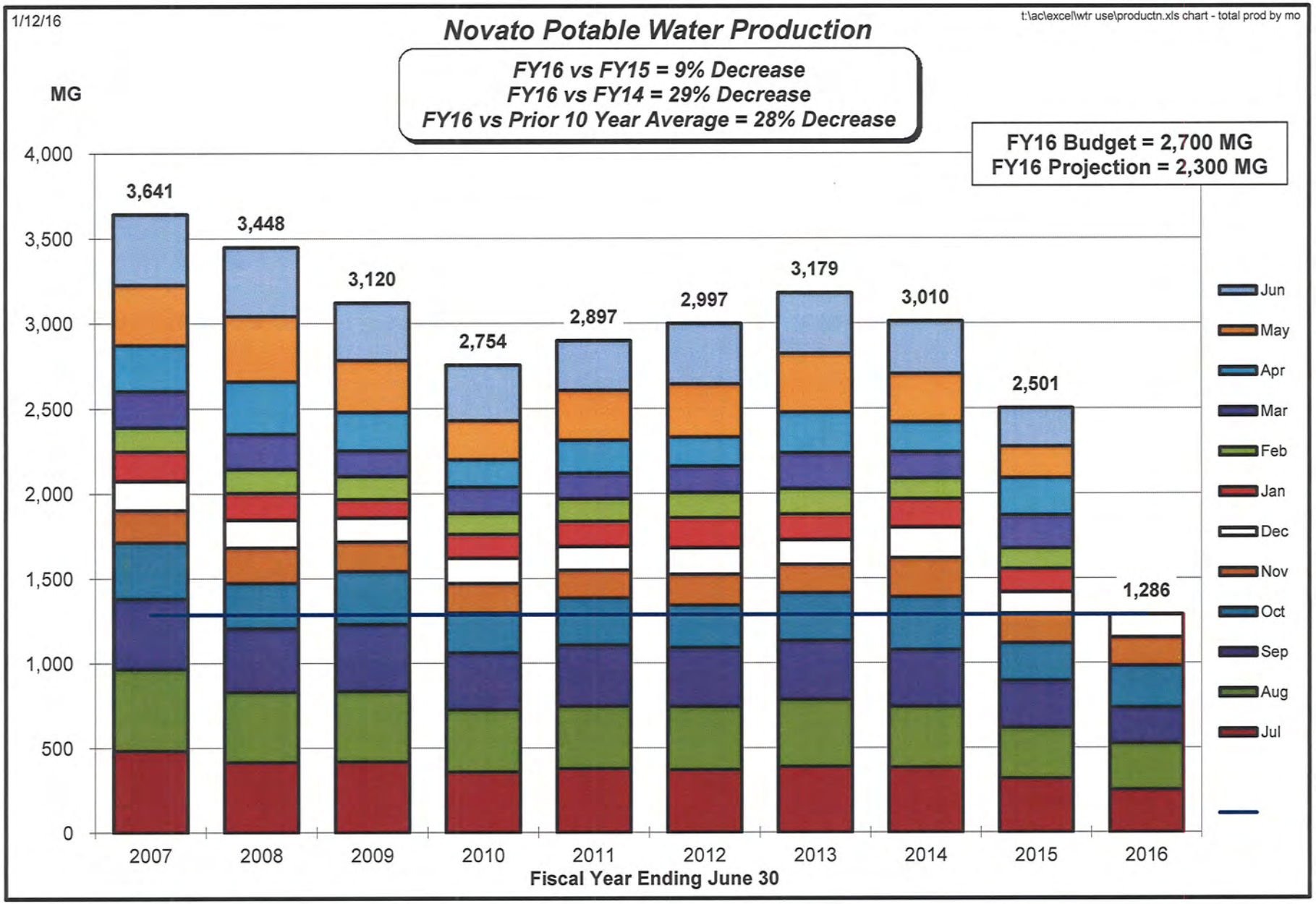
1/12/16

t:\ac\excel\wtr use\[production.xlsx]swrcb goal

SWRCB Emergency Conservation Regulation Progress Report

Novato 2015 Potable Production vs. 2013




1/12/16
t:\ac\excel\wtr use\productn.xls chart - total prod by mo
Novato Potable Water Production
FY16 vs FY15 = 9% Decrease
FY16 vs FY14 = 29% Decrease
FY16 vs Prior 10 Year Average = 28% Decrease
FY16 Budget = 2,700 MG
FY16 Projection = 2,300 MG
MG
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
3,641
3,448
3,120
2,754
2,897
2,997
3,179
3,010
2,501
1,286
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Fiscal Year Ending June 30
Jun
May
Apr
Mar
Feb
Jan
Dec
Nov
Oct
Sep
Aug
Jul

NORTH MARIN WATER DISTRICT

Summary of Complaints & Service Orders December 2015

1/8/2016

Type	Dec-15	Dec-14	Action Taken December 2015
Consumers' System Problems			
Service Line Leaks	0	0	~
Meter Leak Consumer's Side	16	13	Notified Consumer
House Plumbing	0	0	~
Noisy Plumbing	0	0	~
Seepage or Other	0	0	~
House Valve / Meter Off	7	5	Notified Consumer
Nothing Found	11	14	Notified Consumer
Low Pressure	0	0	~
High Pressure	0	0	~
Water Waster Complaints	0	0	~
Total	**34**	**32**	
Service Repair Reports			
Register Replacements	0	0	~
Meter Replacement	1	5	Notified Consumer
Meter Box Alignment	0	0	~
Meter Noise	0	0	~
Dual Service Noise	0	0	~
Box and Lids	0	1	~
Water Off/On Due To Repairs	5	7	Notified Consumer
Misc. Field Investigation	3	1	Notified Consumer
Total	**9**	**14**	
Leak NMWD Facilities			
Main-Leak	0	0	~
Mains-Nothing Found	0	0	~
Mains-Damage	0	0	~
Service- Leak	6	13	Repaired
Services-Nothing Found	4	8	Notified Consumer
Service-Damaged	0	0	~
Fire Hydrant-Leak	2	0	Repaired
Fire Hydrants-Nothing Found	0	0	~
Fire Hydrants-Damaged	2	0	Repaired
Meter Replacement	0	0	~
Meters-Leak	0	0	~
Meters-Nothing Found	0	0	~
Meters Damaged	0	0	~
Washer Leaks	3	3	Replaced
Total	**17**	**24**	
High Bill Complaints			
Consumer Leaks	6	2	Notified Consumer
Meter Testing	0	0	~
Meter Misread	8	4	Notified Consumer
Nothing Found	13	12	Notified Consumer
Projected Consumption	0	0	~
Excessive Irrigation	0	0	~
Total	**27**	**18**	

NORTH MARIN WATER DISTRICT

Summary of Complaints & Service Orders December 2015

1/8/2016

Type	Dec-15	Dec-14	Action Taken December 2015
Low Bill Reports			
Meter Misread	0	0	~
Stuck Meter	0	1	~
Nothing Found	0	1	~
Projected Consumption	0	0	~
Minimum Charge Only	0	0	~
Total	**0**	**2**	
Water Quality Complaints			
Taste and Odor	0	0	~
Color	4	0	***Customer reported brown water. (McKeon Ct)*** Brown water & metals were not detected from inside taps. Samples from outside had some color & low levels of iron, manganese & copper. Customer was notified of results. **Customer reported brown water. (Bradley Ave)** Brown water caused by use of nearby fire hydrant. NMWD staff flushed line. Customer was notified. ***Customer reported brown water. (Bradley Ave)*** Brown water caused by use of nearby fire hydrant. NMWD staff flushed line. Customer was notified. ***Customer reported brown water. (Jennifer Ln)*** Staff was unable to determine cause of brown water. Water contained iron & manganese. NMWD staff flushed line. Customer was notified.
Turbidity	0	0	~
Suspended Solids	0	0	~
Other	1	0	***Customer requested lead test. (Kristin Ln)*** Lead was not detected. Customer was notified of results.
Total	**5**	**0**	
TOTAL FOR MONTH:	**92**	**90**	**2%**

Fiscal YTD Summary				**Change Primarily Due To**
Consumer's System Problems	230	178	29%	Increase In Consumer Service Leaks
Service Repair Report	60	63	-5%	Decrease In Water On/Off For Repairs
Leak NMWD Facilities	131	188	-30%	Decrease In Service Leaks
High Bill Complaints	161	205	-21%	Decrease In Nothing Found
Low Bills	1	7	-86%	Decrease In Stuck Meter
Water Quality Complaints	21	22	-5%	Decrease In Taste & Odor
Total	**604**	**663**	**-9%**	

NORTH MARIN WATER DISTRICT

Summary of Complaints & Service Orders December 2015

1/8/2016

Type	Dec-15	Dec-14	Action Taken December 2015
"In House" Generated and Completed Work Orders			
Check Meter: possible consumer/District leak, high bill, flooded, need read, etc.	173	193	
Change Meter: leaks, hard to read	6	2	
Possible Stuck Meter	0	2	
Repair Meter: registers, shut offs	0	0	
Replace Boxes/Lids	8	3	
Hydrant Leaks	0	0	
Trims	43	9	
Dig Outs	142	69	
Letters to Consumer: meter obstruction, trims, bees, gate access, etc. get meter number, kill service, etc.	0	0	
	372	**278**	

Bill Adjustments Under Board Policy:

December 15 vs. December 14

Dec-15	24	$15,801
Dec-14	16	$5,075

Fiscal Year to Date vs. Prior FYTD

15/16 FYTD	121	$38,351
14/15 FYTD	138	$56,401

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Customer Service Questionnaire Quarterly Report

Quarter Ending 12/31/15

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NMWD

	Response		
Water Quality	Agree	Neutral	Disagree
Courteous & Helpful	2		
Accurate Information	2		
Prompt Service	2		
Satisfactorily Resolved	2		
Overall Experience	2		
	10	0	0

	Response		
Pressure	Agree	Neutral	Disagree
Courteous & Helpful	2		
Accurate Information	2		
Prompt Service	2		
Satisfactorily Resolved	2		
Overall Experience	2		
	10	0	0

Leak	Agree	Neutral	Disagree
Courteous & Helpful	16		
Accurate Information	16		
Prompt Service	13	3	
Satisfactorily Resolved	15	1	
Overall Experience	14	2	
	74	10	0

Noisy Pipes	Agree	Neutral	Disagree
Courteous & Helpful	1		
Accurate Information	1		
Prompt Service	1		
Satisfactorily Resolved	1		
Overall Experience	1		
	5	0	0

Billing	Agree	Neutral	Disagree
Courteous & Helpful	5		
Accurate Information	5		
Prompt Service	5		
Satisfactorily Resolved	5		
Overall Experience	5		
	25	0	0

Other	Agree	Neutral	Disagree
Courteous & Helpful	1		
Accurate Information	1		
Prompt Service	1		
Satisfactorily Resolved	1		
Overall Experience	1		
	5	0	0

Grand Total	129	10	0
	93%	7%	0%

Questionnaires Sent Out	94	100%
Questionnaires Returned	26	28%

Customer Service Questionnaire Quarterly Report

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Quarter Ending 12/31/15

Customer Comments	Staff Response to Negative Comments	Issues NMWD Should Address In The Future
Water Quality		
Tons of information & explained it all to me. Offered to test my water & even pick it up/drop off/call with results. Much nicer & more helpful than I ever expected!		
Leaks		
Leak in toilets, replaced flappers. Thanks		
It was a pleasure working with you.		
It was great how fast someone came out.		
Thank You.		
The service was excellent.		
Very friendly and nice gentleman. Took the time to explain what happened.		
Good service.		
This technician was amazing. He was very knowledgeable and extremely helpful. Thank you.		
Billing		
Nice young man.		
Outstanding customer service!		
Good Job		
Pressure		
Very prompt service and helpful.		
Noisy Pipes		
Other		
Fantastic staff!		

MEMORANDUM

To: Board of Directors January 15, 2016

From: David L. Bentley, Auditor-Controller

Subj: Auditor-Controller's Monthly Report of Investments for December 2015
t:\ac\word\invest\16\investment report 1215.doc

RECOMMENDED ACTION: Information

FINANCIAL IMPACT: None

At month end the District's Investment Portfolio had an amortized cost value (i.e., cash balance) of $11,774,400 and a market value of $11,773,693. During December the cash balance decreased by $260,656. The market value of securities held decreased by $1,296 during the month. The ratio of total cash to budgeted annual operating expense stood at 80%, down 2% from the prior month.

At December 31, 2015, 30% of the District's Portfolio was invested in California's Local Agency Investment Fund (LAIF), 36% in Time Certificate of Deposits, 17% in US Treasury Notes, and 9% in Federal Agency Securities. The weighted average maturity of the portfolio was 200 days, compared to 199 days at the end of November. The LAIF interest rate for the month was 0.40%, compared to 0.37% the previous month. The weighted average Portfolio rate was 0.60%, compared to 0.58% the previous month. Including interest paid by The Bay Club Company on the StoneTree Golf Club Recycled Water Facilities Loan, the District earned $10,054 in interest revenue during December, with 47% earned by Novato Water, 43% earned by Recycled Water (by virtue of the StoneTree Golf Course Loan) and the balance distributed to the two West Marin districts.

NORTH MARIN WATER DISTRICT
AUDITOR-CONTROLLER'S MONTHLY REPORT OF INVESTMENTS
December 31, 2015

Type	Description	S&P Rating	Purchase Date	Maturity Date	Cost Basis[1]	12/31/2015 Market Value	Yield[2]	% of Portfolio
LAIF	State of CA Treasury	AA-	Various	Open	$3,590,054	$3,590,086	0.40% [3]	**30%**
Time Certificate of Deposit								
TCD	Key Bank	n/a	3/19/14	3/21/16	$248,000	$248,000	0.45%	2%
TCD	Barclays Bank	n/a	4/15/14	4/15/16	248,000	248,000	0.55%	2%
TCD	Americanwest Bank	n/a	5/30/14	5/31/16	249,000	249,000	0.50%	2%
TCD	Enerbank	n/a	6/30/14	6/30/16	249,000	249,000	0.65%	2%
TCD	Investors Bank	n/a	7/21/14	7/21/16	249,000	249,000	0.70%	2%
TCD	Comenity Capital Bank	n/a	8/18/14	8/18/16	249,000	249,000	0.80%	2%
TCD	Ally Bank	n/a	10/2/14	10/3/16	248,000	248,000	0.95%	2%
TCD	Cardinal Bank	n/a	11/12/14	11/14/16	249,000	249,000	0.80%	2%
TCD	Goldman Sachs	n/a	12/10/14	12/12/16	248,000	248,000	1.00%	2%
TCD	First Niagara Bank	n/a	4/30/15	5/1/17	249,000	249,000	0.75%	2%
TCD	Discover Bank	n/a	5/6/15	5/8/17	248,000	248,000	0.85%	2%
TCD	Capital One Bank	n/a	6/10/15	6/12/17	248,000	248,000	0.90%	2%
TCD	Flagship Cmnty Bank	n/a	6/24/15	6/24/17	249,000	249,000	0.75%	2%
TCD	American Express Bank	n/a	7/8/15	7/10/17	248,000	248,000	1.15%	2%
TCD	Capital One National Assoc	n/a	8/5/15	8/7/17	248,000	248,000	1.20%	2%
TCD	American Express Centurion	n/a	10/7/15	10/10/17	248,000	248,000	1.20%	2%
TCD	BMW Bank	n/a	12/14/15	12/11/17	248,000	248,000	1.20%	2%
					$4,223,000	**$4,223,000**	**0.69%**	**36%**
US Treasury Notes								
Treas	1,000 - 0.50%	n/a	3/26/14	6/15/16	$999,768	$1,000,078	0.55%	8%
Treas	1,000 - 1.00%	n/a	8/4/14	9/30/16	1,002,674	1,002,148	0.65%	9%
					$2,002,442	**$2,002,226**	**0.60%**	**17%**
Federal Agency Securities								
FFCB	1.70% MTN	n/a	9/15/14	10/28/16	$504,241	$503,879	0.68%	4%
FHLB	0.58% MTN	n/a	11/7/14	11/14/16	499,717	499,555	0.64%	4%
					$1,003,958	**$1,003,434**	**0.66%**	**9%**
Other								
Agency	Marin Co Treasury	AA+	Various	Open	$682,623	$682,624	0.22%	6%
Other	Various	n/a	Various	Open	272,323	272,324	0.42%	2%
			TOTAL IN PORTFOLIO		**$11,774,400**	**$11,773,693**	**0.60%**	**100%**

Weighted Average Maturity = **200 Days**

LAIF: State of California Local Agency Investment Fund.
MTN: Medium Term Note - Maturity of 5 years or less.
TCD: Time Certificate of Deposit, Treas: US Treasury Notes with maturity of 5 years or less.
FFCB: Federal Farm Credit Bank, FHLB: Federal Home Loan Bank
Agency: STP State Revolving Fund Loan Reserve.
Other: Comprised of 4 accounts used for operating purposes. US Bank Operating Account, US Bank STP SRF Loan Account, Bank of Marin AEEP Checking Account & NMWD Petty Cash Fund.

1 Original cost less repayment of principal and amortization of premium or discount.
2 Yield defined to be annualized interest earnings to maturity as a percentage of invested funds.
3 Earnings are calculated daily - this represents the average yield for the month ending December 31, 2015.

Interest Bearing Loans	Loan Date	Maturity Date	Original Loan Amount	Principal Outstanding	Interest Rate
StoneTree Golf Course Loan	6/30/06	2/28/24	$3,612,640	$1,833,736	2.40%
Employee Housing Loans (5)	Various	Various	934,200	934,200	Contingent
Employee Computer Loan (1)	1/8/2015	1/4/2016	893	37	1.52%
TOTAL INTEREST BEARING LOANS			**$4,547,733**	**$2,767,973**	

The District has the ability to meet the next six months of cash flow requirements.

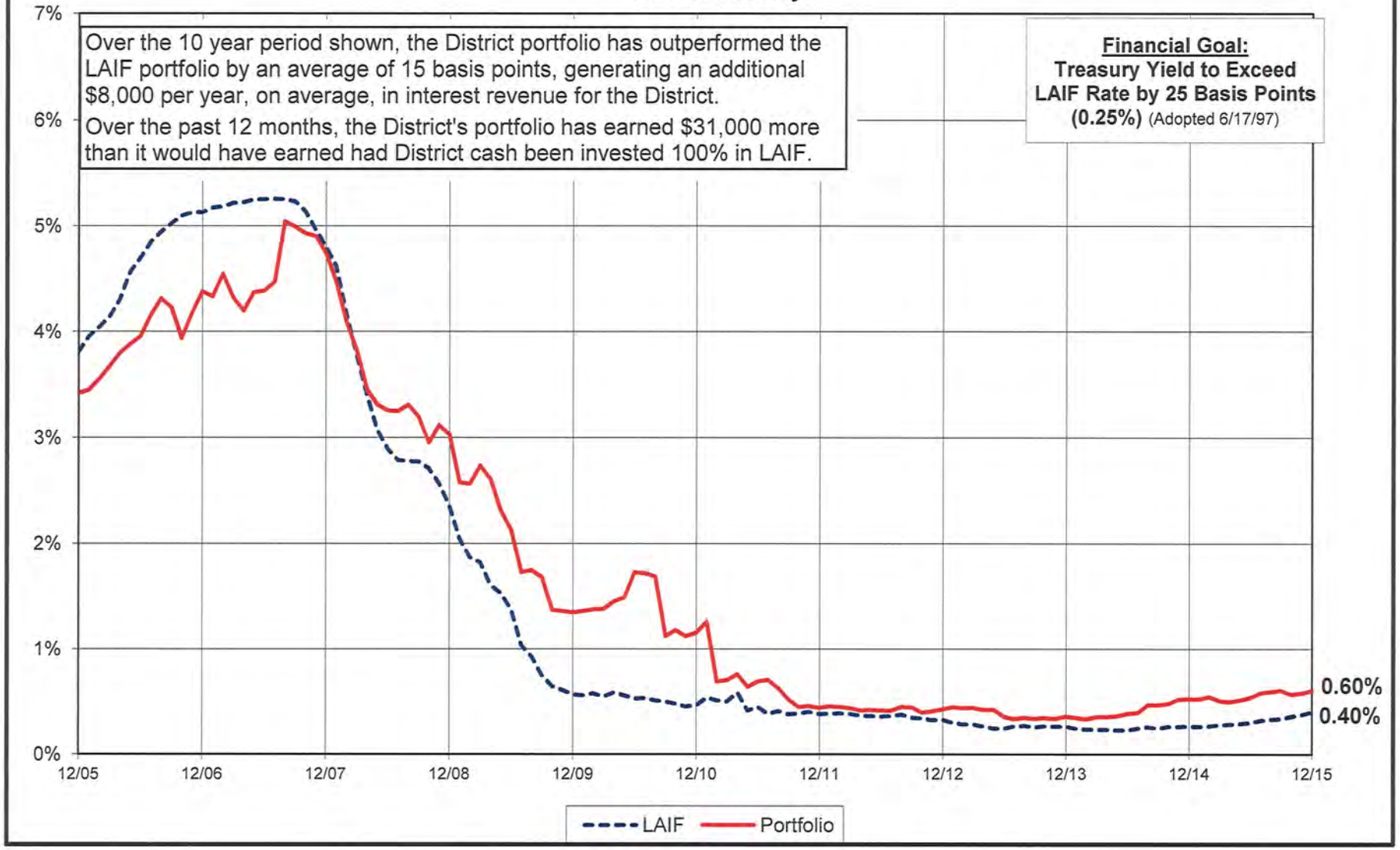
1/13/16

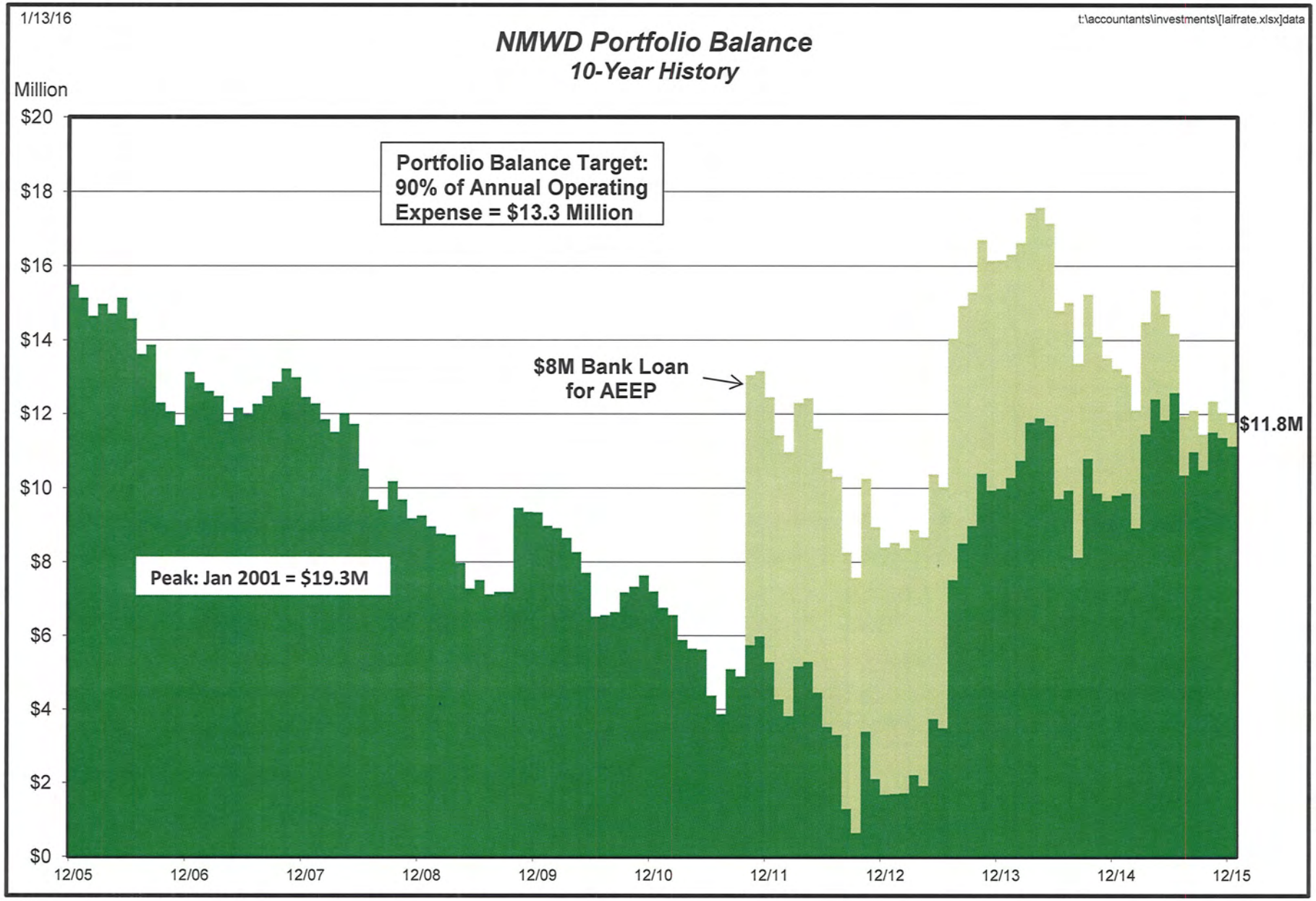
t:\acountants\investments\[laifrate.xls]chart3

NMWD Portfolio Rate of Return

State of CA Local Agency Investment Fund vs District Portfolio

10-Year History




1/13/16
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NMWD Portfolio Balance
10-Year History
Million
$20
$18
$16
$14
$12
$10
$8
$6
$4
$2
$0
Portfolio Balance Target:
90% of Annual Operating
Expense = $13.3 Million
$8M Bank Loan
for AEEP
$11.8M
Peak: Jan 2001 = $19.3M
12/05
12/06
12/07
12/08
12/09
12/10
12/11
12/12
12/13
12/14
12/15

7

ITEM #7

MEMORANDUM

To: Board of Directors January 15, 2016

From: Drew McIntyre, Assistant General Manager/Chief Engineer

Subj: Approve – Quitclaim Existing Unused Easement in Trade for New Easement at 825 DeLong Ave (APN 153-064-21)

R:\Folders by Job No\EASEMENT\QUITCLAIMS\Misc\825 DeLong PipeLine quitclaim BOD memo.doc

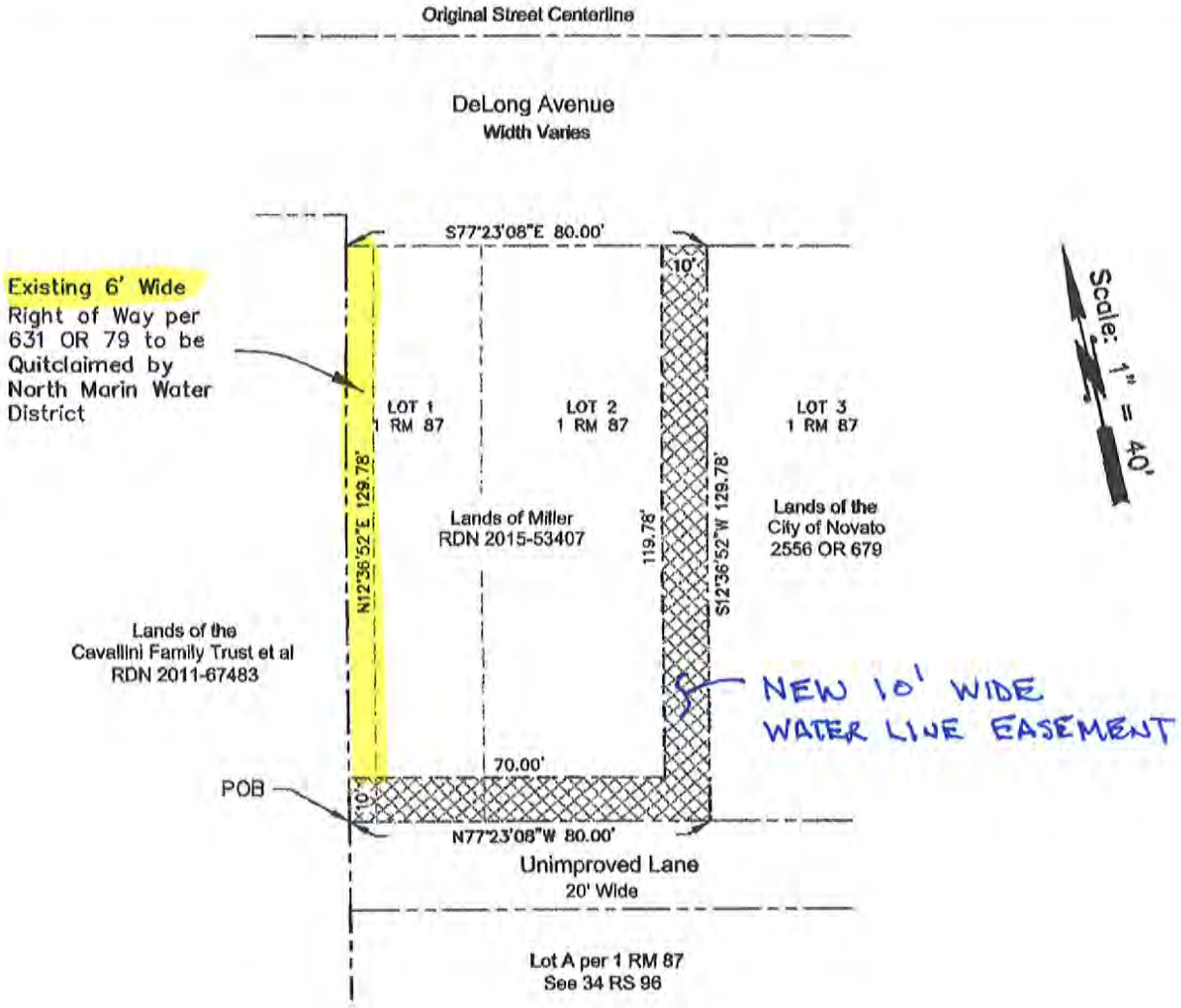
RECOMMENDED ACTION: The Board approve authorization of this quitclaim

FINANCIAL IMPACT: None. Developer Funded

When the North Marin Water District was formed in 1948, various water storage and pipeline facilities (and easements) were subsequently conveyed to the District from the Novato Water Company (owned by Albert Tresch). One of the subject easements, located at 825 DeLong Ave., contains an abandoned pipeline that has not been used for over 50 years (see map in Attachment 1). The existing single family residence property at 825 DeLong (aka the historic Silva-Kuser House constructed in 1903) has a new owner (Ms. Elayne Miller) and is undergoing renovation. It has come to staff's attention that the existing abandoned pipeline conflicts with approved grading plans for the renovation project (Attachment 2). In a cooperative effort with the new property owner, replacement easements will be obtained that are satisfactory to both parties. As a result, District staff recommends quitclaiming the old 6' wide easement (Attachment 3) in trade for a new 10' wide easement (also shown in Attachment 1).

RECOMMENDATION:

That the Board approve quitclaim for APN 153-064-21 and authorize the General Manager to execute said quitclaim.



Legend and Abbreviations

———	Property Line
- - - - -	Easement Line
▨	Water Line Easement (PROPOSED)
OR	Official Records
POB	Point of Beginning
RDN	Recorder's Document No.
RM	Record Map
WLE	Water Line Easement

Note

Bearings and distances for this easement are based on the Record of Survey for this property filed in Book 2013 of Maps at page 36, Marin County Records.

PROFESSIONAL LAND SURVEYOR
DALE ALLEN WHITE
No. 4397
STATE OF CALIFORNIA

Dale White
1-12-16

White & Prescott
Engineering & Surveying
1620 Grant Avenue
Novato, CA 94945

D:\LDT2013\Miller SP\dwg\WLE.dwg

EXHIBIT B

Water Line Easement
825 DeLong Ave
Novato, CA

White & Prescott
Engineering and Surveying
1620 Grant Avenue # 8
Novato, CA 94945

Phone 415-897-7730
white.prescott2@verizon.net

January 12, 2016

Mr. Drew McIntyre
Chief Engineer
North Marin Water District
Via Email

Subject: Miller WLE
825 DeLong Avenue, Novato

Dear Mr. McIntyre:

When the contractor began work on this site, he discovered a water line which is in conflict with the approved grading and drainage plan for this parcel. He subsequently discovered that this water line was in an easement owned by the North Marin Water District.

This water line is not being used presently.

Therefore, on behalf of the property owner, Elayne Miller, we request that the District abandon this water line and quitclaim the easement. We propose that a new Water Line Easement be granted to the District by Ms. Miller in case a new water line is needed in the future from the Hayden tank to DeLong Avenue. Our proposed description (Exhibit A) and plat (Exhibit B) are attached.

Thank you for considering this request. Please call if you have questions.

Sincerely,

Dale White

Dale White

ATTACHMENT 2

RESOLUTION NO. 16-

AUTHORIZATION OF EXECUTION OF QUITCLAIM DEED TO

ELAYNE MILLER

BE IT RESOLVED by the Board of Directors of NORTH MARIN WATER DISTRICT that the President and Secretary of this District be and they hereby are authorized and directed for and on behalf of this District to execute that certain Quitclaim Deed to providing for the release of a pipeline easement which is not required for District purposes.

* * *

I hereby certify that the foregoing is a true and complete copy of a resolution duly and regularly adopted by the Board of Directors of NORTH MARIN WATER DISTRICT at a regular meeting of said Board held on the this 19th day of January 2016, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAINED:

_____

Katie Young, Secretary
North Marin Water District

(SEAL)

R:\Folders by Job No\EASEMENT\QUITCLAIMS\Misc\825 DeLong Quitclaim Resolution.doc

ATTACHMENT 3

Recording requested by:

NORTH MARIN WATER DISTRICT

When Recorded Mail To:

North Marin Water District
P. O. Box 146
Novato, CA 94948-0146

A.P.N. 153-064-21 J-X77 Space above this line
825 DeLong Ave for Recorder's use
Novato, CA 94945

QUITCLAIM DEED

(Release of Easement)

NORTH MARIN WATER DISTRICT
A Public Corporation

does hereby remise, release, abandon, and forever quitclaim to Elayne Miller, hereinafter called "GRANTEE," all of said District's right, title, and interest in and to the following described easement:

A 6 foot wide right of way in, over and upon that certain parcel of land in the City of Novato, County of Marin, State of California more particularly described as follows:

PARCEL ONE (b) conveyed to North Marin County Water District by deed recorded in Book 631 of Official Records at page 79, Marin County Records.

As consideration for this quitclaim deed, GRANTEES, on their own behalf and on behalf of their successors, heirs, and assigns, do hereby release NORTH MARIN WATER DISTRICT from any and all claims whatsoever whether know or unknown, suspected or unsuspected, in law or in equity, that they may have or have had, at any time in the past, present, or future that are in any way related to the use of the easement by NORTH MARIN WATER DISTRICT, including without limitation claims caused by or contributed to in any way by the construction, reconstruction, operation, maintenance, repair or use of pipelines of any composition located therein. As part of this consideration, GRANTEE does hereby expressly and specifically waive all of their rights under Civil Code Section 1542.

Which above quitclaim is in trade for a new Grant of Easement from Elayne Miller to North Marin Water District recorded _____ in Serial No. _____, Marin County California, Official Records and in benefit of said District.

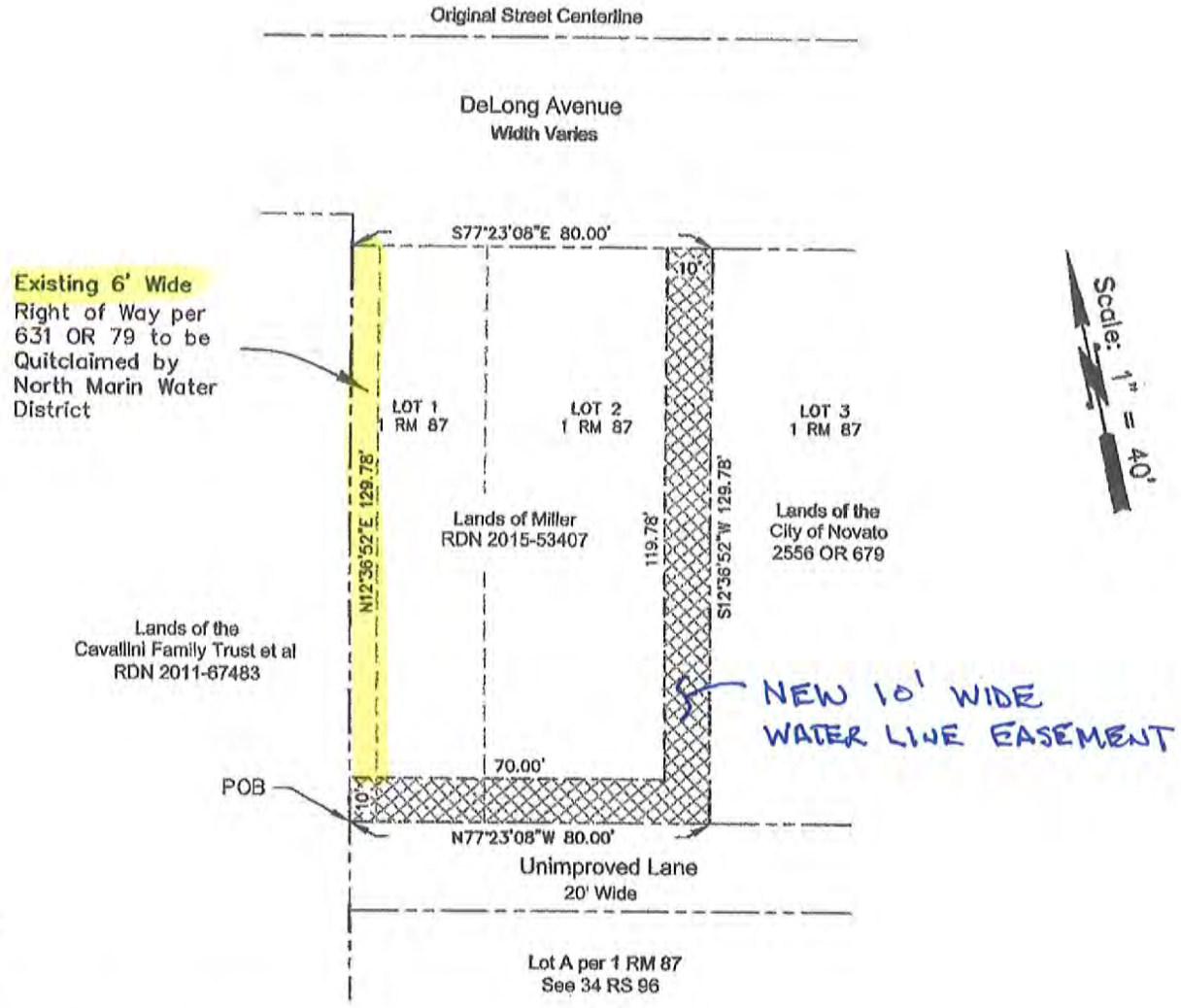
ACCEPTED BY GRANTEE

Date: _____ _____
Elayne Miller

ACCEPTANCE BY NORTH MARIN WATER DISTRICT

Date: _____ _____
Chris DeGabriele, General Manager

_____
Katie Young, District Secretary



Legend and Abbreviations

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Note

Bearings and distances for this easement are based on the Record of Survey for this property filed in Book 2013 of Maps at page 36, Marin County Records.

PROFESSIONAL LAND SURVEYOR
DALE ALLEN WHITE
No. 4397
STATE OF CALIFORNIA

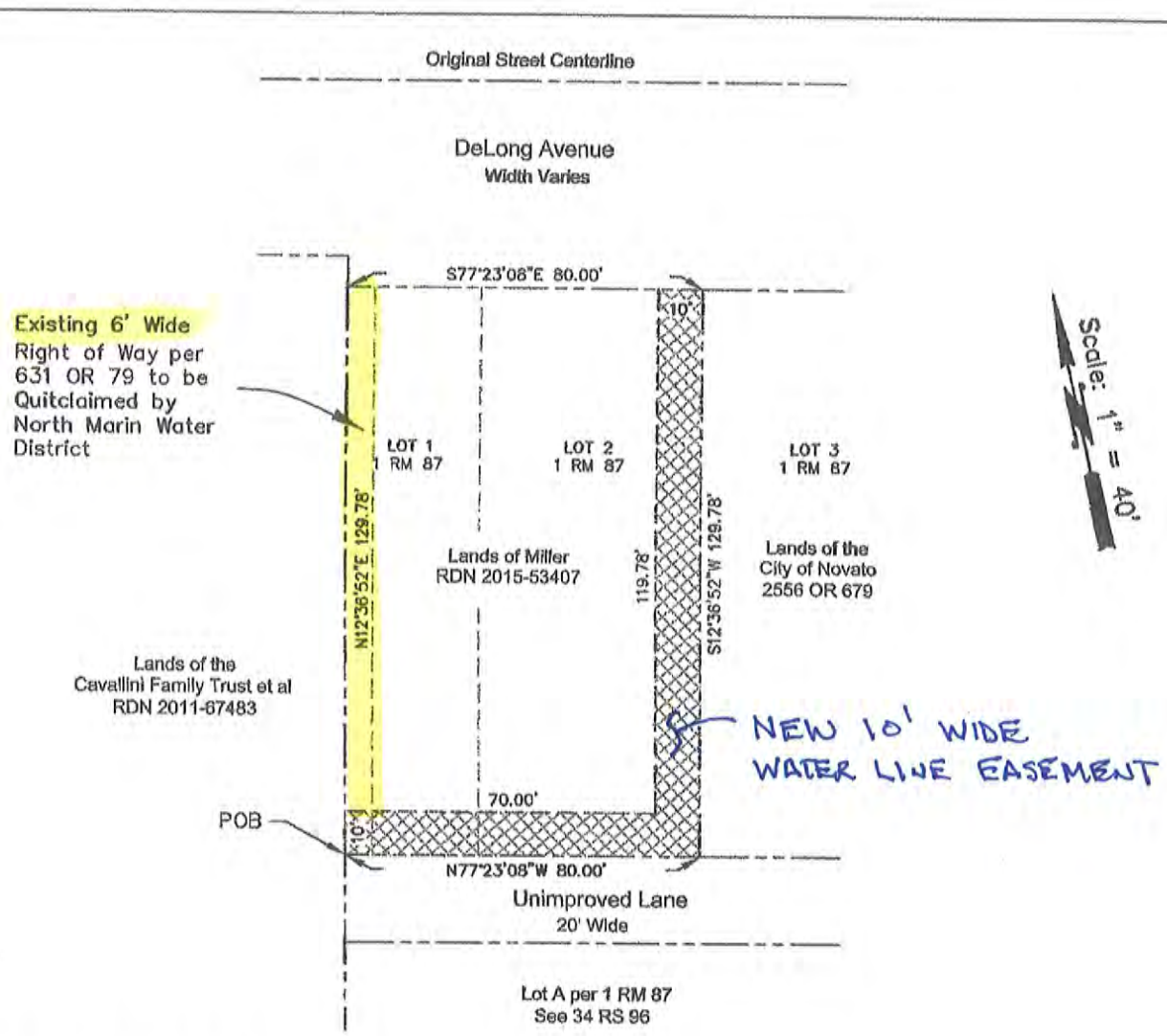
Dale White
1-12-16

White & Prescott
Engineering & Surveying
1620 Grant Avenue
Novato, CA 94945

D:\LDT2013\Miller SP\dwg\WLE.dwg

EXHIBIT B

Water Line Easement
825 DeLong Ave
Novato, CA



Legend and Abbreviations

———	Property Line
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OR	Official Records
POB	Point of Beginning
RDN	Recorder's Document No.
RM	Record Map
WLE	Water Line Easement

Note

Bearings and distances for this easement are based on the Record of Survey for this property filed in Book 2013 of Maps at page 36, Marin County Records.

PROFESSIONAL LAND SURVEYOR
DALE ALLEN WHITE
No. 4387
STATE OF CALIFORNIA

White & Prescott
Engineering & Surveying
1620 Grant Avenue
Novato, CA 94945

Dale White
1-12-16

D:\LDT2013\Miller SP\dwg\WLE.dwg

EXHIBIT B

Water Line Easement
825 DeLong Ave
Novato, CA

8

ITEM #8

MEMORANDUM

To: Board of Directors January 15, 2016

From: Robert Clark, Operations / Maintenance Superintendent RC
Chris DeGabriele, General Manager

Subject: New Hires for the Assistant Distribution and Treatment Plant Operator Position
X:\MAINT SUP\2016\BOD\Memo DTPO hires.doc

FINANCIAL IMPACT: No budget increase required this fiscal year.
$84,000 annually in future years

RECOMMENDED ACTION: Hire two Assistant Distribution & Treatment Plant Operators

Over the past few months District Staff has solicited two separate job postings to fill the Senior Treatment Plant Operator position left open with Vernon Stafford's recent retirement. The first posting was for a Distribution and Treatment Plant Operator (DTPO) resulting in just eight applicants, none of which met the minimum requirements to interview for the position. The second posting was for an Assistant DTPO resulting in over twenty five applications.

Prior to posting the second announcement Staff discussed the desire to have the new hire able to operate the Stafford Treatment Plant as soon as possible. Alternatives evaluated included having the recently retired Senior Operator, Vernon Stafford, return as a contract Operator; contract with MMWD; contract with another Operator; and hire an Assistant DTPO. Because of the nature of the Stafford Treatment Plant process an outside contract operator would require extensive training, and a new hire will still be required to fill the vacancy. Thus Staff believes it makes little sense to spend time training a contract operator that would not be around for the long term. Staff concluded that offering a contract to Vernon Stafford and bringing in an Assistant DTPO would be the best option.

As part of the second effort, Staff focused on candidate qualifications that would allow for the new hire to be able to acquire a T3 certificate in as short a time a possible (T3 certification from the state is the minimum requirement to operate the STP on a production shift). Two criteria that will allow for this are a Bachelor of Science degree and/or an existing T2 certificate. Staff interviewed eight of the applicants that have the best chance to achieve the goal of obtaining a T3 as soon as possible. In further discussion staff considered the need to have additional DTPO personal trained to be ready for future retirements. The oldest of the remaining operators is 56. Therefore, it is Staff's recommendation that the District hire the top two candidates interviewed for the Assistant DTPO position. This will allow more efficient use of our current staff to train them on a parallel track that will

allow the two operators to obtain the T3 and D3 level certifications within the next three years.

The current (FY16) budget includes a full year compensation for the Senior Treatment Plant Operator who retired December 31, 2015. There remains enough money in the FY16 budget to employ two Assistant Distribution and Treatment Plant Operators at the beginning salary for the remaining five months of the fiscal year. Long term, the employment of two Assistant DTPOs to replace the retired Senior Treatment Plant Operator will add $84,000 in cost annually.

Recommendation: Authorize employment of two Assistant Distribution & Treatment Plant Operators at this time.

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ITEM #9

MEMORANDUM

To: Board of Directors January 15, 2016

From: Chris DeGabriele, General Manager

Subject: Pipeworker Promotion
T:\GM\STAFF\2016\Pipeworker promotion.doc

RECOMMENDED ACTION: Authorize Employee Promotion to Pipeworker Position

FINANCIAL IMPACT: $22 in FY16 Budget and $4,100 in FY17 Budget

The Construction/Maintenance Superintendent has recommended promotion for an Assistant Pipeworker to be elevated to the Pipeworker position effective January 16, 2016. Adam Breit has taken on responsibilities of the Pipeworker position for the large crew. He is currently in the 24-month Assistant Pipeworker salary step and it is recommended he be promoted to the beginning Pipeworker step, (essentially a lateral move, with insignificant financial change for FY16). Mr. Breit was hired in May 2010 as a laborer and advanced to the Assistant Pipeworker position in July 2015. Mr. Breit consistently performs well and is a valuable part of the NMWD Construction crew. He meets all the qualifications and skill requirements of the Pipeworker position.

With this promotion, each NMWD Construction crew will be now staffed with a journeyman Pipeworker.

RECOMMENDATION:

Authorize promotion of Adam Breit to Pipeworker Position.

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< AVAILABLE IN ELECTRONIC AGENDA ON WEBSITE >

ITEM #10

MEMORANDUM

To: Board of Directors January 15, 2016

From: Drew McIntyre, Assistant General Manager/Chief Engineer

Subj: Oceana Marin Wastewater System – Acceptance of 2015 Master Plan Update
R:\Folders by Job No\4000 jobs\4046 OM LRP\4046 2015_MP_Update BOD memo_Jan_2016.doc

RECOMMENDED ACTION: That the Board accept the Oceana Marin Wastewater System 2015 Master Plan Update

FINANCIAL IMPACT: None at this time

On March 17, 2015, the Board authorized the General Manager to execute a $25,000 contract with Nute Engineering for the Oceana Marin Wastewater System 2015 Master Plan Update.

The 2015 Master Plan Update Executive Summary is attached for Board review (the complete report is available in electronic form on the District's website). The 2015 Master Plan Update supersedes the 2005 Master Plan Update prepared by Bracewell Engineering, Inc. and takes into account more recent information on sewer flows, connections and future projections. The 2015 Master Plan Update also includes a capital improvement/replacement project plan with high, medium and low priority projects identified based on a review of historical records and field investigations. It is important to note that the projected build-out of dwelling connections for the system continues to decline. In 1995, it was estimated that up to 331 dwelling units could be constructed. This build-out number was reduced to 308 dwelling units in the 2005 Master Plan Update and is currently estimated at 294 dwelling units.

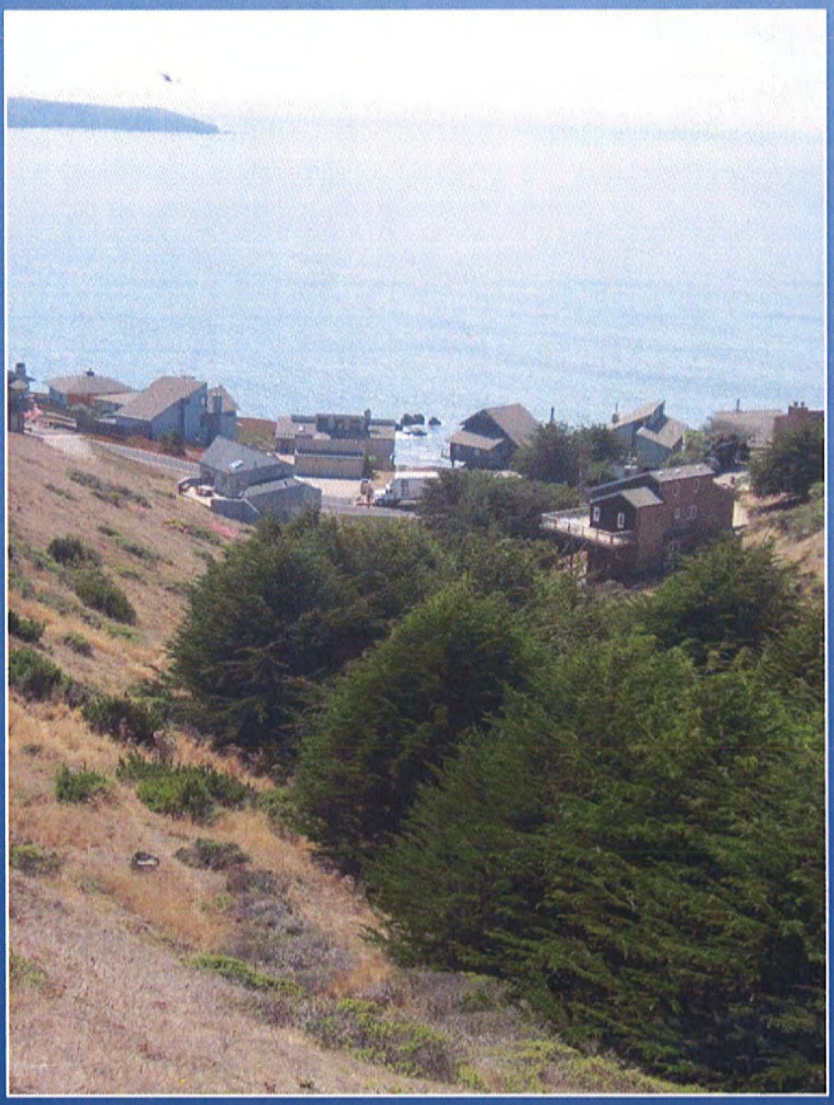
An oral presentation of key report findings will be given by Mr. Edward Nute of Nute Engineering. Staff requests that the Board accept the Oceana Marin Wastewater System 2015 Master Plan Update. If there are any comments that result in corrections to the Plan, those specific pages can be modified and the current page(s) replaced with the new page(s) as appropriate. The 2015 Master Plan Update will continue to serve as a guideline and blueprint for Oceana Marin wastewater system planning. As currently budgeted, the Plan is scheduled to be updated every ten years (similar to the West Marin Water System Master Plan Update schedule).

Please note that acceptance of the final report does not constitute approval or acceptance of any specific project or ideas contained in the report. Any capital improvement project identified in the Plan must be approved and budgeted separately through the annual District budgeting process. Accordingly, any new expenditures will be approved through the regular annual District budget preparation process.

RECOMMENDATION

That the Board accept the Oceana Marin Wastewater System 2015 Master Plan Update final report.

North Marin Water District



2015 MASTER PLAN UPDATE

Executive Summary

For the Oceana Marin Wastewater System

NMWD Job File 8 4046.00

January 13, 2016

Nute Engineering | 907 Mission Ave | San Rafael, CA 94901
Tel: 415.453.4480 | Fax: 415.453.0343 | www.nute-engr.com

NORTH MARIN WATER DISTRICT
OCEANA MARIN WASTEWATER SYSTEM 2015 MASTER PLAN UPDATE

EXECUTIVE SUMMARY

The Oceana Marin subdivision was originally developed in the 1960s and is located just north of the older unincorporated community of Dillon Beach. Wastewater in Oceana Marin is collected by gravity sewers and then pumped to a treatment facility consisting of two ponds and a subsurface disposal field. The current Oceana Marin wastewater system now serves 229 single family homes with a build out potential of approximately 300 homes.

Oceana Marin is situated on a hillside above the Pacific Ocean overlooking a popular recreational beach. Any sewage spill would flow directly onto the beach and into the Pacific Ocean. It is important to ensure there is sufficient redundancy and reliability in the wastewater facilities to minimize this possibility. The Oceana Marin service area is shown in Figure 1.

OBJECTIVE

The objective of the 2015 Master Plan Update for the Oceana Marin Wastewater System is to update the previous Master Plans including an evaluation of the capacity and future demands over a 20 year planning period and to provide a list of recommended capital improvement projects to minimize this possibility.

REGULATORY ISSUES

The Oceana Marin sewerage system is under the jurisdiction of the California Regional Water Quality Control Board North Coast Region and operates under Order No. 92-57, which was adopted in 1992. Since the treated effluent is discharged to land, the permit to discharge does not have to be renewed every five years as it would if the discharge were to a water body.

The current Order is now 23 years old and the Water Quality Control Plan for the North Coast Region now in effect is dated May 2011. It is recommended that NMWD initiate discussions with the staff of the North Coast RWQCB regarding updating the Order so that it conforms to new State policies regarding land disposal facilities. The Oceana Marin system has a good record of compliance so the update of this order may not be a high priority for the RWQCB.

SEWAGE COLLECTION SYSTEM

The Oceana Marin publicly owned sewage collection system is about 5 miles long and generally consists of gravity sewer mains, the majority of which are asbestos cement pipe



1"=200'

FIGURE 1

NO.	DATE	REVISION	BY	APP.
2	9/3/13	ADDED ANNEXATION NO. 11 TO OM-3	AC	CC
1	01/04/07	ADDED ANNEXATION NO. 10 TO OM-3	AC	CC
0	11/01/04	FIRST CAD FILE EDITION		

NORTH MARIN WATER DISTRICT
NOVATO, CALIFORNIA

NORTH MARIN WATER DISTRICT
IMPROVEMENT DISTRICTS
OCEANA MARIN AND DILLON BEACH

DES	DR	CH	SCALE	: 1"=200'	
	CC		DATE	: 11/01/04	
APPROVED: CHIEF ENGINEER			SHEET NO.	: 1 OF 1	SHEETS
R.E. C40936			SERVICE AREA	JOB.NO.	NO.001

(ACP), with some PVC and ductile iron pipe. Over the years there has been some root intrusion, internal deterioration and pipe failures due to ground movement. In 2012/2013 three ACP sewers were lined with cured in place pipe (CIPP) liners.

The sewer system also includes sewer laterals which are privately owned. The length of the private laterals is roughly equivalent to the length of the publically owned sewer mains.

The primary objective in upgrading the Oceana Marin sewer system is to maintain its structural integrity and to reduce the infiltration/inflow (I/I) of extraneous rainwater and ground water during wet weather. Unlike pressure pipes such as water mains, leaks in sewers do not evidence themselves on the ground surface but must be detected through various technologies. As a practical matter it will never be possible to completely eliminate I/I from a gravity sewer system. This extra I/I will stress Oceana Marin's pond treatment/storage system and effluent disposal system.

I/I can be reduced by repairing and rehabilitating the sewers including the private laterals. If it is assumed that sewer mains and laterals are equally leaky and that the public sewer mains represent about half of the pipeline length in the ground then rehabilitation projects that focus only on the sewer mains will only address half of the problem. In some cases when the sewer main is rehabilitated and it is relatively watertight the groundwater will migrate to enter through defects in the private laterals.

In the San Francisco Bay Area sanitation agencies are adopting ordinances which require homeowners to inspect and test their lateral on the sale of the property and repair it if it is found defective. This "point of sale" lateral inspection requirement is very slow in reducing I/I from laterals since there are generally not many home sales in any one year.

Rehabilitation of sewer mains and manholes will eliminate some of the I/I and should be pursued on an on-going basis. The more I/I that can be reduced the less wastewater that needs to be treated and ultimately disposed of in the disposal field. Wet years will produce more wastewater because of the I/I generated in the sewers.

Four sewer line segments were identified for rehabilitation at an estimated cost of $466,300.

PUMP STATIONS

Two sewage pump stations serve Oceana Marin. The North Street lift station is very small and serves 9 homes in a localized area of old Dillon Beach

The Oceana Marin main pump station pumps sewage from all of the Oceana Marin service area to the treatment pond on the top of the hill. This is a vertical rise of over 380 feet and requires special high head pumps. This pump station is one of the two most critical elements of the Oceana Marin system, the force main being the other critical element. Any overflow from a pump or force main failure will flow directly down to the beach.



Oceana Marin Main Pump Station

The main concern with the existing pump station is that most of the electrical components and pump motors are below grade so that if a pipeline leak were to occur inside the pump pit and the sump pump could not handle the water the pump station could become inoperable.

The recommended improvements to the main pump station mostly involve improving reliability by relocating the existing electrical equipment out of the pump pit to a new building which is above grade.

The recommended upgrades to the main Oceana Marin pump station to improve its reliability and eliminate the flooding potential are estimated to cost $263,000.

FORCE MAIN

The force main from the main pump station to the ponds is 6" diameter epoxy lined ACP approximately 3,890 feet long. Although this force main has provided good service it is now some 50 years old. Since it is only a single pipe there is no redundancy in case something happens to the existing force main. In order to provide redundancy it is recommended that a second parallel force main be installed.

Constructing a new parallel force main from the main pump station to the treatment pond in three phases is estimated to cost approximately $1,270,000. This line could be constructed in three phases, which tie back into the existing force main. The first segment of this new force main is estimated to cost $548,000.

POND SYSTEM

The Oceana Marin treatment system consists of an aerated treatment pond and a storage pond. Treated effluent flows by gravity from the storage pond to the land disposal system through a dosing siphon. The two ponds were constructed using dirt berms and are not lined.

Over their 40 some years of operation the wind has eroded some of the dirt berms around the ponds and the sediment has accumulated in the bottom. Although this erosion could be controlled by placing rock rip-rap on the berm sides, the accumulated sediment would still need to be removed eventually since it takes up pond volume.



Treatment Pond

In order to remove the sediment one pond at a time will need to be dewatered and dried out. The most economical project will be to construct a holding pond for the sediment on adjacent NMWD property or it could be applied on off-site agricultural land as a soil amendment. Once the sediment is removed and placed in the holding pond the berms can be reshaped and the pond can be lined with plastic. The total estimated cost for dredging both ponds is $352,000. Pond berm repair with rock rip rap is estimated to cost $670,000. As an alternative, plastic pond lining is estimated to cost an additional $380,000. However, a plastic lining could be damaged every time the pond is dredged.

It is also recommended that the motor control center at the ponds be replaced with new equipment at an estimated cost of $68,000.

EFFLUENT DISPOSAL SYSTEM

The Oceana Marin effluent disposal system consists of a pressure distribution/shallow gravel trench system. This type of system is suited for areas with high groundwater, steep slopes and low infiltration rates. Treated effluent is spread out over a wide area to enhance the infiltration and minimize the seepage to the surface.

Although the existing effluent disposal system has functioned well there are some minor corrective actions which should be undertaken. It is also recommended that the frequency of monitoring of the piezometers be increased to provide insight to the operation of the system and provide data to establish the disposal capacity of the existing disposal system.



Disposal Field

It is also recommended that NMWD begin preparation of a system upgrade/failure plan for the disposal field in which new lines would be installed between the existing lines, which have wide spacing. The cost of this upgrade plan is yet to be determined.

ADDITIONAL STUDIES

It is recommended that the following three additional studies be undertaken at Oceana Marin.

- Electrical Power System Arc Flash Hazard Study - $25,000
- Site Reconnaissance of Geologic Hazard Along Ocean Bluff and Slide Below Effluent Disposal Field - $3,300
- Oversee Monitoring of the Disposal Field Piezometers - $3,000

LONG RANGE IMPROVEMENT MASTER PLAN

The Long Range Improvement Master Plan for the Oceana Marin wastewater system described is shown in Figure 2 and is intended to improve the reliability and redundancy to the Oceana Marin wastewater facilities and consists of the following:

Projects	Est. Project Cost
• Sewer collection system improvements primarily to reduce I/I	$466,300
• Main pump station improvements to improve reliability	263,000
• Force main improvements to improve redundancy	1,270,000
• Pond dredging	352,000
• Pond berm repair with riprap	670,000
• Pond electrical system upgrade	68,000
• Effluent disposal system upgrade	TBD
• Additional studies of different aspects of the wastewater system	31,300
TOTAL ESTIMATED CAPITAL IMPROVEMENT PROGRAM	**$3,120,600**

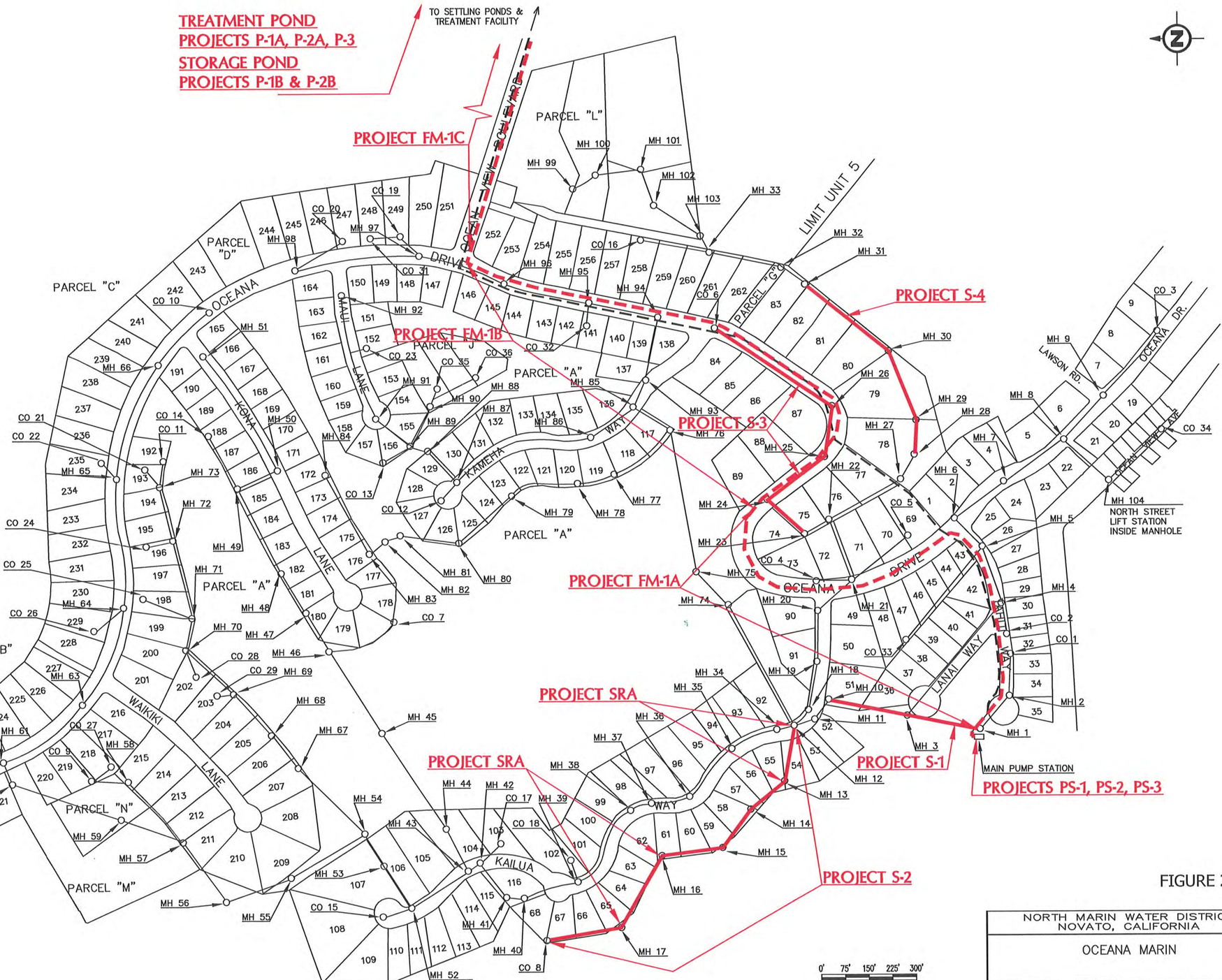


FIGURE 2

NORTH MARIN WATER DISTRICT NOVATO, CALIFORNIA			
OCEANA MARIN			
DATE CREATED:	BY:		SCALE: 1" = 150'
REVISION DATE:	BY:		DRAWING NO.
APPROVED DATE:	BY:		

Dec 04, 2015 - 12:09pm L:\District\NMWD\8464 Oceana Marin Long Range Plan\OM Sewer System CCTV Map.dwg User: PRISCILLA

North Marin Water District



2015 MASTER PLAN UPDATE

Final Report

For the Oceana Marin Wastewater System

NMWD Job File 8 4046.00

January 13, 2016

Nute Engineering | 907 Mission Ave | San Rafael, CA 94901
Tel: 415.453.4480 | Fax: 415.453.0343 | www.nute-engr.com

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NUTE ENGINEERING
Civil & Sanitary Consultants

January 13, 2016

Mr. Drew McIntyre, Chief Engineer
North Marin Water District
999 Rush Creek Place
Novato, CA 94948

Re: Oceana Marin Wastewater System
2015 Master Plan Update
NMWD Job File 8 4046.00

Letter of Transmittal

Dear Drew:

As authorized we have completed the 2015 Master Plan Update for the Oceana Marin Wastewater System.

In brief summary, we have identified improvements to the gravity sewer system necessary to reduce the entrance of extraneous water due to infiltration/inflow as well as improvements to the main pump station and the treatment and storage ponds necessary to improve their reliability. We also recommend construction of a parallel force main from the main pump station to the ponds to improve reliability and provide redundancy. The effluent disposal field requires additional study to determine if improvements might be necessary.

The most critical project involves upgrading the main pump station by relocating the motor control center and other electrical equipment out of the pump pit to a new small building next to the engine generator set building. This will eliminate the possibility that the electrical work will be flooded out which would render the pump station inoperable.

The estimated cost of these improvements in 2015 dollars is $3.12 million, not including any improvements to the disposal field. If these improvements are undertaken over a 20 year period the annual expenditure would be $156,000, plus the adjustment for inflation.

We appreciated the opportunity to assist the NMWD on this planning effort and hope to keep involved as these projects are implemented.

Very truly yours,

NUTE ENGINEERING

By: _____
Mark T. Wilson, P.E.

By: _____
W. Edward Nute, P.E.

NORTH MARIN WATER DISTRICT
OCEANA MARIN WASTEWATER SYSTEM 2015 MASTER PLAN UPDATE

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OCEANA MARIN WASTEWATER SYSTEM
2015 MASTER PLAN UPDATE

BACKGROUND

The Oceana Marin subdivision was originally developed in the 1960s and is located just north of the older unincorporated community of Dillon Beach. The streets in Oceana Marin are private and patrolled but the community is not gated.

Wastewater in Oceana Marin is collected by gravity sewers and then pumped to a treatment facility consisting of two ponds and a subsurface disposal field. Since all treated wastewater is retained on land the Oceana Marin facility is able to operate under Waste Discharge Requirements which were adopted in 1992. Except for nine homes, the community of Dillon Beach is not connected to the Oceana Marin sewer system.

The current Oceana Marin wastewater system now serves 229 single family homes with a build out potential of approximately 300 homes. Potable water is provided to Oceana Marin residents by the Estero Mutual Water Company and the Cal Water Service Company, depending on location.

Oceana Marin is situated on a hillside above the Pacific Ocean overlooking a popular recreational beach. Any sewage spill would flow directly onto the beach and into the Pacific Ocean. Fines assessed for a spill could be very large. For this reason it is important to assure there is sufficient redundancy and reliability in the wastewater collection, pumping, treatment and disposal system.

A Long Range Plan Update, dated December 2005, was prepared for the Oceana Marin Wastewater System by Bracewell Engineering, Inc. The 2005 Long Range Plan updated previous plan reports prepared in 1990 and 1996. These earlier plans provided background information on the wastewater flows and operational data on the pumping, treatment and disposal trenches.

The wastewater treatment system consists of two ponds, one of which is used primarily for storage. The overall capacity of the Oceana Marin sewer system is limited by the ability of the trench disposal system to dispose of the treated effluent, which includes extraneous infiltration/inflow (I/I) to the sewer system, rainwater falling on the ponds and pond seepage return flows. The 2005 Long Range Plan concluded that the capacity of the pond treatment system was adequate for the projected growth through 2015.

The recommendations of the 2005 report focused on improving and optimizing the effluent disposal field. In addition, the report recommended that a study be conducted of how best to minimize the I/I to the sewer system to allow more efficient operation of the pump station and to increase the margin of safety in the operation of the disposal field.

There are also concerns about the wind erosion of the banks of two treatments ponds and there have been instances of plugging of the drip irrigation lines going to the leach field by algae from the ponds. It may be necessary to line the ponds or at least control the bank erosion. The ponds are close to various potable water well sites so it is important to make sure there is no cross contamination.

The disposal capacity of the trench field was tested in 1995 and found to be 63,000 gallons per day (gpd). The 2005 report did not test the trench field but concluded that the disposal capacity was 29,600 gpd based on actual operation. Apparently, the lesser disposal capacity is adequate for the present needs but it may be advisable to set up another test. The original testing was conducted twice, once during the spring and a second time during the summer. Each test was conducted over a 30 day period.

OBJECTIVE

The objective of the 2015 Master Plan Update for the Oceana Marin Wastewater System is to update the previous Master Plans including an evaluation of the capacity and future demands over a 20 year planning period and to provide a list of recommended capital improvement projects.

APPROACH

The operational success of the Oceana Marin sewage system depends on the disposal of all the sewage and any extraneous water generated in the sewer system. The approach to developing the 2015 Master Plan Update will consist of analyzing and updating the available flow and monitoring data in the previous master plans, reviewing the present condition of the various pumping, treatment and disposal facilities and developing a program of capital improvements.

The following are considered critical factors in the operation of the Oceana Marin system:

- Minimize inflow/infiltration of extraneous storm water and groundwater which enter the sewer system.
- Ensure reliability of the pump stations.
- Provide redundancy in the mechanical systems as well as the force main. Construction of a second parallel force main might be advisable.
- Maintain the pond treatment and storage capacity of the two ponds including controlling bank erosion.
- Maintain the effectiveness of the trench disposal system as necessary to dispose of all the wastewater generated in Oceana Marin.

Because of the close proximity of Oceana Marin to beaches the Long Range Plan Update summarized below focuses on providing redundancy and reliability for the Oceana Marin sewer system.

PREVIOUS STUDIES

Since its construction in the 1970s the following studies have been conducted on the Oceana Marin wastewater system:

- Bracewell Engineering, "*Disposal System Capacity at Oceana Marin Final Report*", 1990
- Bracewell Engineering, "*Long Range Master Plan for Oceana Marin Wastewater System*", 1996
- Bracewell Engineering, "*Long-Range Master Plan Update for Oceana Marin Wastewater System*", December 2005

The 1990 report evaluated the capacity of the disposal field and recommended modifications to the pond treatment system and disposal field to increase the effluent disposal capacity. These improvements were completed in 1991.

The 2005 Master Plan Update reviewed the operation data of the Oceana Marin system and concluded that the capacity of the existing disposal system is the limiting unit process.

FACILITY INSPECTION

As a part of developing the Master Plan an inspection of the Oceana Marin facilities was made on April 16, 2015. Inspections were made of the two pump stations, the treatment and storage ponds, dosing siphon and disposal field. We also walked the sewer alignment along the cliff below Kailua Way. In attendance were Robert Clark, Brad Stompe and Vernon Stafford of the NMWD staff, Todd Beecher of Beecher Engineers, Troy Pearce of AYS Engineering Inc. and Mark Wilson and W. Edward Nute of Nute Engineering.

SERVICE NEEDS

The Oceana Marin service area is shown on Figure 1, which shows the NMWD Improvement District of Oceana Marin and Dillon Beach and the annexations. The Oceana Marin service area comprises all of Oceana Marin and nine homes along Ocean View Ave in the older section of Dillon Beach.

Land Use in Oceana Marin is governed by the Dillon Beach Community Plan dated August 1989, which was approved by the California Coastal Commission in June 1989. Oceana



1"=200'

FIGURE 1

NO.	DATE	REVISION	BY	APP.
2	9/3/13	ADDED ANNEXATION NO. 11 TO OM-3	AC	CC
1	01/04/07	ADDED ANNEXATION NO. 10 TO OM-3	AC	CC
0	11/01/04	FIRST CAD FILE EDITION		

NORTH MARIN WATER DISTRICT
NOVATO, CALIFORNIA

NORTH MARIN WATER DISTRICT
IMPROVEMENT DISTRICTS
OCEANA MARIN AND DILLON BEACH

DES	DR	CH	SCALE : 1"=200'
	CC		DATE : 11/01/04
APPROVED: CHIEF ENGINEER			SHEET NO. : 1 OF 1 SHEETS
R.E. C40936			SERVICE AREA / JOB.NO. / NO.001

Marin is a planned community with single family homes and a potential for multiple units. Table 1 summarizes the potential dwelling units in the Oceana Marin service area.

TABLE 1 – OCEANA MARIN SERVICE AREA – SERVICE CONNECTIONS

	Potential Homes	Existing Homes
Oceana Marin		
Original subdivision unit	262	216
Parcel J	3	3
Parcel K zoning	14 – 38	0
Parcel L zoning	5- 13 (act = 4)	0
Parcel M	1	1
Old Dillon Beach homes	9	9
TOTALS	**294 – 326**	**229**

Even though Parcels K and L are zoned for as many as 38 and 13 homes respectively it is likely that the actual number will be on the low end. In fact Parcel L, zoned for 5 – 13 homes, was subdivided into only 4 parcels in 2006. The number of lots was restricted because of a jurisdictional wetlands on the parcel.

Assuming the low numbers of homes for Parcels K and L the potential build out of the present service area would be 294 units. For the purpose of this study it is estimated that the total number of connections to the present service area of the Oceana Marin sewer system will be around 300 homes.

The vacant lots in the original subdivision are slowly being built out. Historically NMWD estimates that the rate of growth in Ocean Marin has been approximately 1 new home connection per year.

The occupancy of the homes in Oceana Marin is difficult to estimate. There are some full time residents, weekenders, renters as well as seasonal weekenders and renters. The Bracewell Master Plan of 2005 analyzed the flow records between 1973 and 2005 and concluded that the average occupancy was 1.35 persons per home with a flow of 76 gallons per capita per day (gpcd). In the ten years since 2005 there h have been only 13 new connections and the conditions in Oceana Marin have not changed except for the recent drought. For the purpose of this report it is concluded that the occupancy of 1.35 persons per connection appears to be reasonable.

Table 2A

NMWD OCEANA MARIN WASTEWATER SYSTEM

INFLUENT FLOWS TO PONDS, Gallons

YEAR	2009	2010	2011	2012	2013	2014	2015	ADF
JAN	330,000	914,000	790,000	475,000	930,000	382,000	930,000	21,894
FEB	663,000	581,180	577,000	432,000	426,000	658,000	564,350	19,906
MAR	383,000	649,000	875,330	640,000	422,000		449,036	18,378
APR	420,000	533,000	577,000	558,000	498,000	590,439	405,011	17,055
MAY	440,000	276,000	522,000	416,000	390,000	410,000		13,194
JUNE	448,000	641,000	484,000	408,000	408,000	455,000		15,800
JULY	614,000	589,000	799,000	434,000	751,000	610,307		20,416
AUG	440,000	651,000	535,000	547,000	376,000	532,004		16,565
SEPT	441,000	388,000	414,000	432,000	404,000	370,491		13,608
OCT	386,000	411,000	424,000	422,000	421,000	381,494		13,148
NOV	361,000	414,000	467,000	425,000	460,000	438,000		14,250
DEC	419,000	924,000	535,000	783,000	237,000	1,035,200		21,146
TOTALS	5,345,000	6,971,180	6,999,330	5,972,000	5,723,000	5,862,935	2,348,397	

Table 2B

NMWD OCEANA MARIN WASTEWATER SYSTEM

DISCHARGE TO IRRIGATION FIELDS OCT - SEPT

YEAR	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
OCT	0	0	637,000	559,000	0	212,000
NOV	0	699,000	662,000	0	0	344,000
DEC	647,000	718,000	632,000	0	0	0
JAN	347,000	591,000	0	818,000	0	992,000
FEB	738,000	858,000	0	809,000	0	254,000
MAR	924,000	1,190,000	0	770,000		725,000
APR	592,000	880,000	0	0	892,560	98,000
MAY	782,000	1,010,000	0	529,000	542,000	
JUN	0	0	294,000	156,000	489,000	
JUL	555,000	400,100	582,000	304,000	0	
AUG	1,040,000	771,000	757,000	359,000	459,000	
SEP	0	0	603,000	377,000	0	
TOTALS	5,625,000	7,117,100	4,167,000	4,681,000	2,382,560	2,625,000

WASTEWATER FLOWS

The main Oceana Marin pump station is equipped with a flow meter as is the discharge to the effluent disposal field. Table 2A summarizes the monthly influent flows pumped to the treatment pond between 2010 and 2015 and Table 2B summarizes the monthly flows to the disposal field between the months of October through September of the next year for the years 2010 – 2015.

As described above Oceana Marin has some full time residents, including renters and some vacation rentals. The higher flow for June, July and August would correspond with vacation rentals during the summer. Because of its remote location and uncertain weather, Oceana Marin will probably never be fully occupied with permanent residents.

Table 3 gives two projections of the average dry weather flow (ADWF) and two projections of the per capita flow rate. The first projection includes only the months of June July and August and the second includes the months of May through September. As can be seen in Table 2A the three summer months and particularly the month of July have higher flows than May and September, probably due to higher summer occupancy. The three month ADWF is approximately 10% higher than the five month ADWF.

TABLE 3 DRY WEATHER FLOW ASSUMPTIONS

Connections	229
Average Occupancy Rate, persons/connection	1.35
Average Population	309
ADWF June, July, August, 2009–2014, gallons	17,612
Per capita flow, gpcd	57
ADWF May through September, 2009-2014, GPD	15,917
Per capita flow, gpcd	51.5
Biochemical Oxygen Demand (BOD), mg/l	200
Suspended Solids, mg/l	200

Using the Bracewell assumption of 1.35 persons per connection and the existing 229 connections to the Oceana Marin sewer system the per capita flow rate is computed to be 57 gpcd for June July and August which represents a 25% reduction from the 76 gpcd projected by Bracewell in 2005. This reduction may be explained by the prolonged drought in the area. For the five months between May and September the per capita flow rate computes to be 51.5 gpcd. Once the drought subsides the per capita sewage discharge may rebound closer to the 76 gpcd.

For the purpose of projecting annual base sewage flows we have assumed that the May through September ADWF is more appropriate. For the existing development of 229 homes the annual base sewage flow @15,917 GPD will be 5,809,705 gallons.

At a full build-out the Oceana Marin development of an estimated 300 homes at the Bracewell occupancy rate of 1.35 persons/connection and a per capita flow rate of 51.5 gpcd would produce a dry weather flow of around 20,858 god producing an annual base flow of 7,612,988 gallons. If the per capita flow rate increases to 76 gpcd the annual base flow will be 11,234,700 gallons.

Infiltration/Inflow – The flow pumped to the ponds is influenced by infiltration/inflow (I/I) into the sewer system. The County maintains a weather station at Oceana Marin. Graphs of the daily rainfall for 2010 through 2015 are shown in Appendix A. The recorded rainfall totals between October 1 and September 30 for these years together with the measured sewage flow and flow to the disposal field are shown in Table 4.

The flows to the disposal field are managed so that the ponds are as low as possible at the end of the dry season, i.e. in October. This maximizes the ability to store winter flows in the ponds and minimizes the loading on the disposal field in the winter. During the summer and over a prolonged drought water is lost through evaporation, which accounts for the lower flow applied to the disposal field than comes into the ponds.

TABLE 4 – RAINFALL VERSUS TOTAL ANNUAL FLOWS

Time period	Rainfall	Total flow to ponds, gal	Excess flow over base flow*, gal	Total flow to disposal field, gal
10/1/09–9/30/10	30.93”	6,338,180	528,475	5,625,000
10/1/10–9/30/11	36.01”	7,322,330	1,512,625	7,117,100
10/1/11–9/30/12	23.95”	5,768,000	(41,705)	4,167,000
10/1/12–9/30/13	23.82”	6,235.000	425,295	4,681,000
10/1/13–9/30/14	18.12”	5,126,241	(190,037)	2,382,560
10/1/14–4/15/15	22.69”	4,203,091	828,687	2,625,000

*Base flow for the existing 229 connections is estimated to be 5,809,705 gallons or as prorated for missing data.

It should be noted that 2014 and 2015 were considered drought years and the domestic water usage and I/I would have been lower than the historic normal. During these years the flow to the disposal field was about half that of other years.

Although this is less than six full years of data it is apparent that the total flow to the ponds is greatly influenced by the rainfall. The average rainfall for Oceana Marin is probably

around 30". The last four years had less than normal rainfall. It should be noted that for the period between October 1, 2014 and April 2015, a total of 12.69" of rain was recorded in December 2014 and 3.58" of rain fell over three days in February 2015. These two concentrated storms probably account for the 868,687 gallons of excess sewage flow over the prorated base flow even though the total rainfall October 1, 2014 to April 2015 was only 22.69".

Based on the six years of data summarized in Table 4, during a normal year the excess sewage flow over the base flow, which is pumped to the ponds on an annual basis, is estimated to account for an additional 1,000,000 gallons. During a wet year the excess annual flow could constitute approximately 2,000,000 gallons. These excess flows represent the I/I entering the system and it should be emphasized that these I/I amounts are only estimates to be used for planning the operation of the disposal field.

Projected annual wastewater flows – Based on the above analysis Table 5 gives the existing and projected annual wastewater flows for dry and wet years and assuming an occupancy of 1.35 persons per connection and 51.5 gpcd flow rate and no change in the I/I rates.

TABLE 5 – PROJECTED ANNUAL WASTEWATER FLOWS, gallons

	Existing 229 homes	**Build-out 300 homes**
Dry year		
Domestic wastewater flow	5,809,705	7,612,988
I/I flow	1,000,000	1,000,000
Totals	6,809,705	8,612,988
	Existing 229 homes	**Build-out 300 homes**
Wet year		
Domestic wastewater flow	5,809,705	7,612,988
I/I flow	2,000,000	2,000,000
Totals	7,809,705	9,612,988

WASTEWATER FACILITIES

The Oceana Marin Wastewater Facilities consist of a conventional sewer collection system, two pump stations, pressure force mains, a pond treatment system and a subsurface land disposal field. Many of these facilities were constructed with the initial development and various improvements have been made over the years.

The collecting sewers are located on generally west facing slopes where any spills would drain toward the Pacific Ocean and the beaches below the cliffs. The disposal field is located on a north facing slope which drains toward the Estero de San Antonio which discharges to the Pacific Ocean.

The treatment ponds and disposal field are located on the top of the hill above the development. Estero Mutual Water Company and the Cal Water Service Company maintain potable water facilities nearby, including wells and a storage pond.

REGULATORY ISSUES

The Oceana Marin sewer system is under the jurisdiction of the California Regional Water Quality Control Board North Coast Region. Waste discharge requirements (WDR) have been issued rather than a NPDES Permit. Since the Oceana Marin system discharges treated effluent to the land through an underground disposal field there is no discharge to receiving waters.

The current WDR for the Oceana Marin system are set forth in Order No. 92-57, ID No. 1880173MAR (see Appendix B) and references a project which involved minor changes to the original facilities. This order describes the project location and the treatment and disposal system in use. The Water Quality Control Plan for the North Coast Region adopted April 28, 1988 is referenced as the basis for this order.

The Oceana Marin disposal system is within the watershed of the Estero de San Antonio. The listed beneficial uses of the Estero de San Antonio and its tributaries include municipal and domestic water supply, water contact recreation, fish spawning and shellfish harvesting. These beneficial uses are very restrictive and dictate the discharge requirements set forth in Order No. 92-57.

Sewage from Oceana Marin is treated in an aerated pond and the treated effluent is disposed of through underground leach lines. The disposal field is to be operated so that no water surfaces or runs off. Order No. 92-57 requires that the pond effluent be disinfected after the pond treatment and prior to going to the leach field. Since no effluent surfaces or runs off, disinfection does not seem to serve any purpose. In fact, the residual chlorine may be affecting the micro biology in the soil.

Waste Discharge Requirements Review Procedures – The current WDR is now 23 years old and the Water Quality Control Plan for the North Coast Region now in effect is dated May 2011. This plan includes a policy on the control of water quality with respect to onsite waste treatment and disposal practices, which primarily pertains to individual septic tanks and leach fields but would also apply to the Oceana Marin disposal system, since there are no specific policies regarding large disposal fields.

In order to get an idea of the way the State handles WDRs we contacted Blair Allen of the San Francisco Bay Regional Water Quality Control Board. He explained that the Oceana Marin WDR is very old and that WDRs do not have fixed expiration dates, or a mandated renewal schedule. Internally, the Water Boards have an administrative protocol for periodic review of WDRs, with a 3-tiered schedule of 5, 10 or 15 years between reviews, based on the case's assigned "Threat-to-Water-Quality" rating.

In the past decade actual implementation of WDR reviews has been hampered by limited budget and staff. So in reality the individual Water Boards may be seriously back-logged on their formal review schedule.

Aside from a standard review protocol, the alternate approach is to consider the actual discharges, the discharge facility, infrastructure, natural surroundings, who is operating it, and so forth, and compare that with the WDR. If the WDR does not reflect current water quality requirements or the facility has a history of non-compliance, then it deserves attention. If the WDR is even partially in tune with current requirements, then perhaps the WDR does not have to be reconsidered very often.

Statewide General Waste Discharge Requirements for Sanitary Sewer Systems – On May 2, 2006 the State Water Resources Board adopted Order No. 2006-0003-DWQ which set forth requirements for all publically owned sewer systems greater than one mile in length. These Statewide General Waste Discharge Requirements focused on preventing sanitary sewer overflows (SSOs) to receiving waters and required each agency to develop a Sewer System Management Plan (SSMP).

In December 2013 NMWD adopted an SSMP for the Oceana Marin sewer system. The SSMP set forth management, operation and maintenance goals for the sewer system together with specific measures and procedures for containing any sewage spills. Required spill notification procedures and report forms are also included.

State Water Board Policy for Onsite Wastewater Treatment Systems – State Water Board policy regulates onsite wastewater treatment systems (OWTS). The policy was adopted June 19, 2012 and will be incorporated in the next update of the Water Quality Control Plan for the North Coast Region.

Recommendation – It is recommended that NMWD initiate discussions with the staff of the North Coast RWQCB regarding updating the WDR to conform to any new State policies regarding land disposal facilities applicable to the Oceana Marin system. Oceana Marin has a good record of compliance so the update may not be a high priority. The RWQCB staff should be kept apprised of improvements made to the Oceana Marin wastewater facilities and the issue of disinfection by chlorination prior to final disposal in the effluent disposal field be reviewed.

2015 MASTER PLAN ESTIMATED COSTS

The facility improvements described below are intended to be incorporated into the 20 year Master Plan for Oceana Marin. The cost estimates are planning level estimates based on 2015 construction costs for the San Francisco Bay Area representing an ENR construction cost index of 11,160. The allowance for contingencies and incidentals does not include costs for project design and construction management. The construction costs for future years are escalated on a 5% annual inflation factor to the year of construction.

SEWAGE COLLECTION SYSTEM

The Oceana Marin development is located at Dillon Beach in West Marin County and was developed in the 1960's and 1970's. The publicly owned sewage collection system is about 5 miles long and generally consists of gravity sewer mains, the majority of which are asbestos cement pipe (ACP). Over the years there has been some root intrusion, internal deterioration and pipe failures due to ground movement. Where repairs have been made sections of PVC or ductile iron pipe have been installed. As described below three sewers were rehabilitated in 2012 using cured in place pipe (CIPP) liners.

All sewage is pumped to a wastewater treatment facility consisting of a treatment pond and a storage pond. The treated effluent from these ponds is applied to the land via subsurface disposal. In order not to overload the subsurface disposal field it is important to limit the entrance of extraneous infiltration and inflow (I/I) into the sewer system.

The sewer system also includes sewer laterals which are privately owned. The length of the private laterals is roughly equivalent to the length of the publically owned sewer mains.

The Oceana Marin development is located on very steep terrain and many of the public sewage collection lines are located both in paved roads and in easements below the homes. Some of the slopes where the sewers are in easements range in grade from 20 to 35%, Some manholes can only be accessed by foot. The steeper easement areas are generally grassy and brushy and in some areas there has been some local ground movement. Along the cliff above the ocean the backyards are mostly covered with heavy ice plant. There are no backyard fences and few private property improvements to restrict access.

I/I Reduction – I/I is defined as excess groundwater or rainwater which enters the sewer system. Infiltration is defined as groundwater which enters pipes underground. Inflow is rain water which enters the sewer system through illegal drainage connections. A third component is rainfall induced I/I which is water that can enter the sewers through underground pipe defects during intense rainfall events.

Unlike pressure pipes such as water mains, leaks do not come to the surface to evidence themselves but must be detected through various technologies. As a practical matter it will never be possible to completely eliminate I/I from a gravity sewer system. Rehabilitation projects are never perfect and some leaks will remain or will increase because other nearby leaks have been "bottled up". In other words, expectations of I/I reduction need to be tempered with reality. The greatest I/I reductions will be achieved by assigning the highest priority to repairing or rehabilitating those sewers or manholes which are discovered to have identifiable defects.

I/I can be reduced by rehabilitating the sewers including the private laterals. If it is assumed that sewer mains and laterals are equally leaky and that the public sewer mains represent about half of the pipeline length in the ground then rehabilitation projects that focus on the sewer mains will only address half of the problem. In some cases when the sewer main is

rehabilitated so it is relatively watertight the groundwater will migrate to enter defects in the private laterals.

Many sanitation agencies have spent years and many dollars rehabilitating their sewers with very little to show for it in terms of I/I reduction. Some agencies rehabilitate the private laterals along with sewer main rehabilitation projects or require homeowners to repair their laterals when defects are found. In the San Francisco Bay Area sanitation agencies are adopting ordinances which require homeowners to inspect and test their lateral on sale of the property and rehabilitate it if it is found defective. This "point of sale" lateral inspection requirement results in a lengthy time to reduce I/I from laterals since there are generally not many home sales in any one year.

The main tools for locating leaks in sewers are closed circuit televising (CCTV) and smoke testing. NMWD already has a well-developed program for CCTV of the sewer mains on a regular schedule. The last smoke testing was done in 2014.

Smoke Testing – Smoke testing involves blowing non-toxic smoke into a section of sewer through a manhole while making observations of smoke coming out of the ground indicating a defect or coming out of a drain indicating an illegal drainage connection. The defects are documented and the smoke coming out of the ground is photographed. Where defects or illegal drainage connections are found in private laterals notices are sent to the property owner with a request to repair the defect. This procedure requires notification of homeowners of the smoke test, conducting the smoke testing, documentation of the defects, sending notices to the property owners to repair the defect found, and follow up with smoke testing to make sure the repair has been made and is successful.

Pipe Segment Inventory and CCTV – NMWD cleans and televises one fifth of the sewer pipe segments in Oceana Marin each year. Televising is done with a closed circuit TV (CCTV) camera and the results are summarized in a spreadsheet which is updated every two years. The inventory spreadsheet of 2014 is included as the NMWD OM Master Sewer List, Appendix C. Private laterals have not been inspected.

The Appendix C spreadsheet identifies sewer defects and problems together with recommendations for repairs. The length of the different pipe types in the system, the number of structures and the number of various types of defects found are summarized in Table 6 below.

Joint offset, joint separation, cracks and exposed gasket make up more than a third of the defects found and slightly less than one third of the defects are roots in the pipe joints even though there are very few trees in Oceana Marin. If there were more trees this total would be much higher. Grease and sags constitute about 14% of the defects.

TABLE 6– CCTV INVENTORY OF PUBLIC SEWER MAINS – 2014

PIPE TYPE	Length, feet	Percent
ABS	113	0.4
ACP	16,841	61.8
PVC	4,290	15.8
CIPP	3,257	12.0
Not reported	2,698	10.0
TOTALS	**27,199**	**100.0**
STRUCTURES		
Manholes	103	
Rodholes (Main line cleanouts)	36	
MAJOR DEFECTS FOUND BY CCTV		
Joint offset, joint separation, crack, gasket exposed	47	38.5
Sag in pipe or grease accumulation	17	14.0
Roots in joint	40	32.8
Infiltration/Inflow	7	5.7
Lateral problem at main	9	7.4
Camera can't get through pipe	2	16
TOTALS	**122**	**100.0**

There are some 103 manholes and 36 rodholes in the Oceana Marin sewer system. NMWD regularly inspects and smoke tests these structures and schedules repairs as necessary. NMWD inspection reports for work done on February 28, 2014 and dated 6/1/15 are listed in Appendix D.

Recommendations – It is recommended that reduction of I/I be continued as a long term objective. CCTV and smoke testing are tools to inventory the condition of sewer lines and locate leaks and identify repair locations and sewer rehabilitation projects as described below.

SEWER REHABILITATION

Rehabilitation of sewer mains and manholes will eliminate some of the I/I and should be continued on an on-going basis. The more I/I that can be reduced the less wastewater that needs to be pumped, treated and stored and ultimately discharged to the disposal field. Wet years will produce more wastewater because of the I/I generated in the sewers.

Some defects found in the CCTV are sags or grease accumulation. These types of defects are not necessarily related to I/I but may require more frequent maintenance to keep the sewer from becoming restricted. Sags will accumulate debris and grease and if the sewer

plugs up it could result in an overflow. CIPP lining or pipebursting will take the same alignment of the original sewer so a sewer with a sag must be dug up and a section re-laid to eliminate the defect.

The private sewer laterals will also contribute I/I. Smoke testing described above will be able to locate some of the points of direct inflow. The homeowner will need to be requested to fix the leak. However, since laterals are considered the property of the homeowner it will be difficult to require further lateral rehabilitation. Adopting an ordinance requiring that laterals be tested upon the sale of a home will be a way to test the laterals and get defective ones fixed over the long term.

The following is information on the sewer rehabilitation methods and a list of proposed sewer main rehabilitation projects which should be included in the Long Range Capital Improvement Plan (CIP).

Asbestos Cement Pipe (ACP) – The fact that the majority of the sewers in Oceana Marin are ACP limits the rehabilitation options. ACP was a common sewer and water pipeline material in the 1960's and 1970's. However, in the last several decades there is increasing awareness that asbestos can be a serious public health concern when friable and air borne and its disposal is now regulated by the EPA.

When it is underground and in use ACP is not considered to pose any public health risk because it is non-friable. However, if AC pipe is crushed, pulverized or reduced to a powder it is then considered to be friable and becomes a regulated asbestos containing material (RACM) waste. In 1991 the EPA took the position that "crushing" AC pipe with mechanical equipment would cause the crushed material to become RACM and that pipe crushed and left in place would cause the location to be considered an active waste disposal site. Pipebursting could cause the AC pipe to be categorized as regulated waste. Inactive lines should be kept on the agency's maps and marked as a USA line so contractors don't dig through it and break it up or crush it.

The owner of every site where AC pipe was pipeburst would need to notify the EPA of the owner's intent to become an active asbestos landfill, meet deed restrictions, submit closure requirements and mapping documentation. In addition, future excavation work in the vicinity would require an additional 45 day notification of intent to disturb landfill material. Other Federal, State or local permit conditions may apply.

ACP Sewer Rehabilitation Methods – In order to avoid the regulatory issues described above ACP sewers should be rehabilitated by a method other than pipebursting such as replacement or with some type of lining such as cured-in-place-pipe (CIPP) lining. CIPP involves inserting a resin impregnated liner into an existing sewer. The liner takes the shape of the sewer and the pipe ends up slightly smaller in diameter than the original pipe. The lining thickness can be specified for a fully deteriorated pipeline where the liner must take the full external load. For 6" diameter sewers the CIPP lining is generally about 4.5

mm thick, which will only reduce the inside diameter by 3/8 of an inch. The resin impregnated liner can be cured with either steam or UV light depending on the product manufacturer. Laterals must be reconnected to the CIPP liner, which can become a point where infiltration/inflow can enter. CIPP lining is an appropriate trenchless technology for rehabilitation of ACP sewers because it leaves the ACP in place as the host pipe.

Inverting a CIPP liner in a 6" pipe is difficult because it tends to hang up on slight joint offsets. Consequently, contractors do not like to use CIPP lining on 6" pipe so the cost will be about the same as CIPP lining of an 8" or even 10" pipe.

2012 Sewer Rehabilitation Project – The District has rehabilitated three of the cross country sewers on steep gradients in Oceana Marin using the CIPP lining process totaling 2,850 feet of 6" and 8" pipe. The purpose of the project was to prevent further deterioration, eliminate potential separation at bell and spigot joints, reduce infiltration/inflow and minimize the potential for sewer spills. The three sewers which were lined ran from Kameha Way to Kailua Way, Kona Lane to Kailua Way and Waikiki Lane to Kailua Way. The greatest elevation difference from top to bottom of one of the sewers was 320 feet. The sewer laterals were not rehabilitated but re-connected to the CIPP liner.

Identified Rehabilitation Projects – Based on the CCTV results NMWD routinely undertakes maintenance and repairs as indicated such as cutting roots and digging down and repairing cracks and other isolated defects. Some lines have multiple defects and it is advisable to undertake a capital improvement project to rehabilitate one or more segments of sewers. The following is a list of recommended sewer rehabilitation projects, also shown on Figure 2, together with their estimated costs:

Project S-1 – Pump Station to Kailua Way: MH 1 through MH 3 to MH 10 Kailua Way (477') – The CCTV revealed several sags, infiltration and a separated joint. Part of this line crosses a gully in an above ground pipe. According to the original plans this is 10" diameter ACP except that 40' of ductile iron (DI) pipe was used to span the gully. The plans show a grade of 0.005 which should be adequate. It is unclear why there are sags; either the pipe was improperly laid originally or there has been some ground movement. This line is near the edge of the cliff above the ocean so ground movement is a possibility. If the ground is moving the line may need relocation away from the cliff, which would also probably mean relocating the pump station. A geotechnical investigation would be appropriate to check on the stability of the cliff. This also applies to Project S-2 described below. If the sag is not a major problem and the line is judged to be adequate then it could be CIPP lined. The estimated cost of the CIPP lining of this sewer is given below:

477 LF CIPP lining of 10" ACP	@$75/LF	$35,775
Contingencies and Incidentals (35%)		12,525
TOTAL ESTIMATED CONSTRUCTION COST		$48,300

Project S-2 – Kailua Way Ocean Side: MH 12 thru MH 13, MH 14, MH 15, MH 16, MH 17 to CO 8 (1,125') – This series of sewers runs along the top of the cliff behind the homes on the west side of Kailua Way. The cliff is covered with heavy ice plant so it is difficult to see if there are any cracks or ground movement. The CCTV revealed a number of sags and separated joints in this line. This line is noted as all 6" PVC so it should not be as fragile as ACP. CIPP lining or pipebursting using an HDPE liner would seal up this pipe but unless the sags are dug up and re-laid they will remain. The estimated cost of the CIPP lining of this sewer is given below:

1,125 LF CIPP lining of 6" PVC	@$75/LF	$84,375
Contingencies and Incidentals (35%)		29,625
TOTAL ESTIMATED CONSTRUCTION COST		$114,000

If the cliff becomes unstable and this sewer is threatened it might be necessary to abandon it and require the property owners to install pumps that pump to the existing sewer in Kailua Way. This could involve up to 15 homes. The cost of installing a high end duplex (2 pump) home pumping system can be $25,000. Sometimes the home service is inadequate to add a pump and needs to be upgraded. Even if NMWD pays for the pump installation it can be a difficult process to require home owners to take on the ongoing maintenance and electric cost.

Project S-2A – Kailua Way Segment Replacement: MH 12 to MH 13 and MH 16 to MH 17 (380') – The only pipe segments in Project S-2 with noted sags and joint offsets are between MH 12 to MH 13 and MH 16 to MH 17. These segments could be rehabilitated with a CIPP lining or pipeburst but the sags will remain unless they are dug up and re-laid. The estimated cost of digging up and replacing these two sewers is given below:

380 LF Replace 6" PVC	@$200/LF	$76,000
Contingencies and Incidentals (35%)		26,000
TOTAL ESTIMATED CONSTRUCTION COST		$102,000

Project S-3 – Oceana Drive CIPP Lining: MH 23 to MH 24 (Oceana Drive) thru MH 25, MH 26, to CO 6 (1,005') – This series of sewers are all 6"ACP and the CCTV notes many separated joints and roots with a comment "potential slip line". It is not clear why there are so many roots entering this line unless it was defective or if there has been ground movement. MH 23 is located in an easement behind 320 Oceana Drive and runs uphill to MH 24, which is in Oceana Drive. This series of lines could be rehabilitated with CIPP lining. The distance between MH 26 and CO 6 is almost 450 feet, which is longer than the industry standard of 200 feet and an intermediate manhole should be added. The estimated cost of the CIPP lining of this sewer plus an additional manhole is given below:

1,005 LF CIPP lining of 6" ACP	@$75/LF	$75,375
Manhole	@$5,000	5,000
Subtotal		$80,375
Contingencies and Incidentals (35%)		27,625
TOTAL ESTIMATED CONSTRUCTION COST		$108,000

Project S-4 – Ocean Drive Rear Easement: MH 28 thru MH 29, MH 30, to MH 31 (933') – This is a 6" ACP easement sewer behind homes #360 and #380 Oceana Drive. The CCTV inspection reported sags and joint separations in this line. There was also a note that there appeared to be I/I in this line even though it does not serve many homes. If the line is judged to be adequate then it could be CIPP lined. The estimated cost of the CIPP lining of this sewer is given below:

933 LF CIPP lining of 6" ACP	@$75/LF	$69,975
Contingencies and Incidentals (35%)		24,025
TOTAL ESTIMATED CONSTRUCTION COST		$94,000

PUMP STATIONS

Two sewage pump stations serve Oceana Marin. The smallest pump station on Ocean View Ave, the North Street Lift Station, serves a localized area of old Dillon Beach and the main pump station pumps sewage from Oceana Marin to the ponds at the top of the hill. The pump stations were inspected on April 13, 2015 which included an inspection of the electric equipment by Todd Beecher of Beecher Engineering. The Electrical System Assessment Report by Beecher Engineering is reproduced in Appendix E.

North Street Lift Station – The North Street lift station serves 9 homes in old Dillon Beach along Ocean View Ave. The lift station consists of two ¾ horsepower submersible pumps located inside a manhole at the intersection of Ocean View Ave and North Street. Sewage is pumped through a 2-inch diameter force main one block on North Street to the gravity sewer on Oceana Drive with a vertical rise of about 16 feet. The electric meter and control panel is located in a free standing enclosure facing Oceana Drive next to 21 North Street.

The reserve capacity of the North Street Lift Station is just the volume of the manhole containing the pumps. A 4' diameter manhole has a volume of 94 gallons per foot of depth. Assuming a 3' deep manhole the storage volume is 283 gallons, which is less than the daily discharge volume from two homes. If there is a prolonged power outage NMWD should be prepared to provide a gas driven pump or tanker truck to pump out the lift station manhole.

Oceana Marin Main Pump Station – The Oceana Marin main pump station is located between the cul-de-sacs of Tahiti Way and Lanai Way and pumps sewage from all of the Oceana Marin service area to the treatment ponds on the top of the hill. This is a vertical rise of over 380 feet and requires special high head pumps. The pump station consists of a

below grade concrete structure and a small building housing a standby engine generator set. A flow meter is provided on the discharge force main.

The pump station is located at an elevation of approximately 66 feet and is near a cliff which leads down to the beach. The cliff is a type of sandstone and is eventually erodible, particularly as the sea level rises. At some point it may be necessary to relocate the pump station away from the cliff if it erodes to a point which is threatening the operation of the station. The incoming sewers, particularly from the north, should be monitored for damage from erosion.

The pump station itself consists of a wet well which is separated from the dry well containing the pumps and electrical work by a wall. There is a grit catchment area in the wet well which is pumped out once a year. Aeration is provided for the sewage in the wet well to keep it fresh and reduce odors.



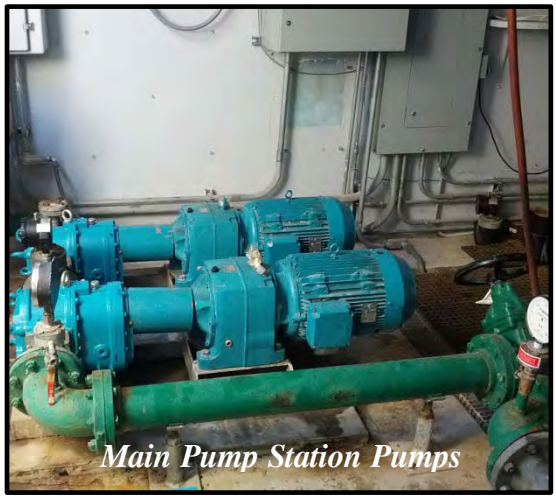
Oceana Marin Main Pump Station

The dry well part of the pump station contains two sets of rotary lobe pumps; four pumps total. Each set of two pumps are connected in series to be able to overcome the high pumping head. Each pump has a capacity of 100 gallons per minute (gpm) at a discharge pressure of 180 psi. Each set (Set A & B) have two pumps (Pump 1 & 2) the set of pumps (1 & 2) operate together. The lead pump 1 starts at 6' and stops at 2' The two sets of pumps A & B are in a lead lag operation and switch after every pump cycle. If one of the individual pumps (1 or 2) fails, that set automatically shuts off and the other set is called to run.



Doghouse Shed

The flowmeter is an Rosemont magnetic type with a 4" diameter flow tube, located in a pit outside the pump station. There is a single sump pump in the pump pit, which also contains the pump motors and critical electrical panels.


Main Pump Station Pumps

Main Pump Station Condition Assessment
The main pump station is one of the two most critical elements of the Oceana Marin system, the force main being the other critical element. Any overflow from a pump failure will flow directly down to the beach.

Most of the mechanical equipment appears to be well maintained and in good working order. The main concern with the existing pump station is that most of the electrical work and pump motors are all below grade so that if a pipe were to break or a leak were to occur and the sump pump could not handle the water all the major electrical equipment could become inoperable. In some cases a second sump pump has been installed to provide some redundancy. The assessment of the electrical equipment in the main Oceana Marin pump station is summarized in the Beecher Engineering report in Appendix E.

In order to improve the reliability against accidental flooding of the pump pit, which would damage the pump motors as well as any electrical work it is recommended that a second sump pump be installed as a backup to the existing sump pump.

Contingency Planning – In the event that the pumps and/or electrical work are flooded or otherwise fail or force main fails it will be necessary to transport the incoming sewage up the hill to the ponds. The very high static head from the pump station to the ponds precludes the use of conventional trash pumps as emergency pumps. The best method to deal with the sewage will be to hire tanker trucks to pump from the wet well and discharge to the ponds at the top of the hill. This contingency is addressed in the Sewer System Management Plan (SSMP) for Oceana Marin.

If a standby pump were to be used it would have to be a match of the existing pumps such as two dual rotary lobe pumps on a skid. However, the temporary pumps would have to be either connected to the electrical starters which are in the pump pit and difficult to work on or connected to the standby engine generator set with its own separate starter. The pumps are probably not readily available and this arrangement would not be easy to set up in an emergency. Consequently, use of tanker trucks would be the most expedient procedure.

The daily flow at Oceana Marin is estimated to be 15,000 gallons during dry weather. In wet weather the sewage flow could be much higher, even 30,000 gallons. The wet well if fully flooded has a storage capacity of around 12,000 gallons so it could hold almost 80% of a full day's flow during dry weather. Tank truck capacities will range from 3,000 gallons to 5,000 gallons and higher. The large capacity trucks are difficult to maneuver so it is probably not convenient for the Oceana Marin streets.

Accordingly, in dry weather during an emergency the sewage can be held in the flooded wet well and be pumped out with a 3,000 gallon tank truck five times a day until the repair is made. It should not be necessary to set up an emergency pump unless the shutdown is going to be prolonged.

Recommended Pump Station Improvements

The recommended improvements to the main pump station mostly involve improving reliability by upgrading some of the electrical equipment and relocation of the existing electrical equipment out of the pump pit to a new building which is above grade.

Project PS 1 – Miscellaneous Reliability Upgrades – The following reliability upgrades to the pump station are recommended:

Install redundant sump pump	$12,000
Install low pressure alarm on discharge force main	5,000
Estimated miscellaneous improvements	15,000
Subtotal	32,000
Contingencies and Incidentals (35%)	11,000
TOTAL ESTIMATED CONSTRUCTION COST	$43,000

Project PS 2 – Oceana Marin Pump Station PG&E Meter/Main Replacement – The existing PG&E meter and main circuit breaker enclosures have deteriorated beyond repair and require replacement. It is recommended that an outdoor, 316 stainless steel "meter/main" pedestal, rated for outdoor use, be installed within the existing "Doghouse" shed location (e.g., Tesco pedestal). This replacement will not require any modification to the existing PG&E service entrance other than engagement of PG&E to disconnect the existing meter and re-connect the new pedestal meter once it is installed. The estimated installed cost for this replacement is as follows:

Demolition of Existing Metering and Main Breaker Enclosure	$3,000
316 Stainless Steel Pedestal Meter/Main Enclosure	15,000
PG&E Cost:	3,000
Subtotal	21,000
Contingencies and Incidentals (35%)	9,000
TOTAL ESTIMATED CONSTRUCTION COST	$30,000

Project PS 3 – Relocation of Electrical Equipment to Aboveground Block Building – The location of the sewage pump LCP, PLC control panel, bubbler panel and main panelboard are all prone to failure due to below grade structure flooding. During discussions with NMWD, there seemed to be a comfort level that keeping the flowmeter, grinder LCP and blower equipment in the below grade structure would be acceptable since the operation of this equipment is not as critical to overall pump station operability as the level control system and sewage pumping. To mitigate these

vulnerabilities, it is recommended that the LCP/PLC/bubbler panel/main panelboard equipment be relocated to an above grade "add on" room, attached to the existing above grade block building. This new room could essentially become the "Electrical Equipment Room", constructed with block walls and an industrial type personnel door that provides a good seal from the outside elements. Based on preliminary measurements, existing equipment relocation to the interior of the existing standby generator room may not be possible due to National Electrical Code (NEC) clearance requirements. Additionally, the ventilation system within the generator room will expose the electrical panels to outside salt air on a regular basis (i.e., ventilation fan and louver system). Thus, an "add on" room to the existing building is recommended over using existing wall space within the existing standby generator room. Also included as part of this recommendation is the replacement of the existing ventilation louver and addition of flexible propane fuel piping connections for the existing engine generator. All motor control cabinets and hardware, even inside the building, should be type 314 stainless steel. Where possible items should be plastic.

The estimated installed cost for this recommendation is as follows:

Construct three sided block addition to engine generator building	$50,000
Relocate ATS from "Doghouse" to Electrical Room	25,000
New small panelboard to replace panelboard in "Doghouse"	5,000
Relocate Pump LCP's (Quantity 2)	15,000
Relocate PLC Control Panel	10,000
Relocate Bubbler Panel	10,000
Relocate Main Panelboard	15,000
Miscellaneous Electrical Costs	10,000
Subtotal	140,000
Contingencies and Incidentals (35%)	50,000
TOTAL ESTIMATED CONSTRUCTION COST	$190,000

FORCE MAIN

The force main from the main pump station to the ponds is 6" diameter epoxy lined ACP approximately 3,890 feet long. According to the plans the force main has two different pressure classes, Class 150 and Class 200 (rated at 150 and 200 psi respectively). The 380 foot elevation difference from the pump station to the ponds means that at the pump station end the static head is 164 psi, which together with friction losses when the pumps are pumping could approach the 200 psi rating of the pipe.

Although this force main has provided good service it is now some 50 years old. Also, since it is only a single pipe there is no redundancy in case something happens to the existing force main. Although isolated repairs can be made with full circle clamps any leakage will flow directly through the storm drainage system to the beach below. In order to provide redundancy it is recommended that a second force main be installed.

The route of the existing force main includes two easements as a short cut bypassing the large curve in Oceana Drive. However, this easement would be too crowded to accommodate a second new force main. The estimated cost of a new force main from the Oceana Marin pump station to the ponds, shown on Figure 2, assuming conventional trench restoration is given below.

Project FM-1 – Parallel Force Main (Entire force main)

4,610 LF 6" Force Main	@$200/LF	$922,000
Est. Connection at the pump station		5,000
Est. Connection at the ponds		3,000
Subtotal		$930,000
Contingencies and Incidentals (35%)		325,000
TOTAL ESTIMATED CONSTRUCTION COST		$1,255,000

It would be possible to stage the construction of this force main by connecting back to the existing force main in a couple of locations at the end of each phase. Starting at the pump station the force main could be constructed in three phases as follows:

Project FM-1A – Pump Station to 360 Oceana Drive

1,980 LF 6" Force Main	@$200/LF	$396.000
Est. Connection at the pump station		5,000
Est. Intermediate connection		5,000
Subtotal		406,000
Contingencies and Incidentals (35%)		142,000
TOTAL ESTIMATED CONSTRUCTION COST		$548,000

Project FM-1B – 360 Oceana Drive to Ocean View Blvd.

1,390 LF 6" Force Main	@$200/LF	$278,000
Est. Intermediate connection		5,000
Subtotal		283,000
Contingencies and Incidentals (35%)		99,000
TOTAL ESTIMATED CONSTRUCTION COST		$382,000

Project FM-1C – Ocean View Blvd to Treatment Ponds

1,240 LF 6" Force Main	@$200/LF	$248,000
Est. Connection at the ponds		3,000
Subtotal		251,000
Contingencies and Incidentals (35%)		89,000
TOTAL ESTIMATED CONSTRUCTION COST		$340,000

Recommendations – It is recommended that Project FM-1A be assigned a high priority. This initial segment will be located in streets and will provide a redundant force main to the existing segment which is located partially in easements and thus is more vulnerable to external damage. Furthermore, this segment has the highest internal pressure and the new replacement pipe will provide greater reliability.

The existing force mains paralleling the remaining two projects are subject to less internal pressure and are located in streets where they are less subject to external damage. Thus, Projects FM-1B and FM-1C should be assigned a lower priority.

POND TREATMENT AND STORAGE

The Oceana Marin treatment system consists of two ponds. The west pond is aerated and provides the treatment of the raw wastewater. The east pond is the storage pond and receives effluent from the treatment pond and provides storage of the treated wastewater prior to discharge to the effluent disposal field. Treated effluent is discharged from the north end of the storage pond and flows by gravity through a dosing siphon to disposal field leach lines.

A small chlorinator is used to disinfect the pond effluent prior to flowing to the disposal field. Since the effluent is disposed of underground, it is uncertain whether or not the chlorination has any adverse or beneficial effect on the biology in the disposal field. However, chlorination of effluent going to a leach filed is not a normal practice. The need to continue to disinfect should be brought up in discussions with the Regional Water Quality Control Board about renewing the waste discharge requirements.

The two ponds are constructed with dirt berms and are not lined. A gravel interceptor trench was installed for the length of the base of the southern berms of both ponds to intercept pond seepage and any surrounding groundwater. The intercepted water flows to a sump where a sump pump recycles it back to the east storage pond. Occasional gopher holes in the berms can be a problem that is monitored.

The date on the original plans for the ponds is 1972, which indicates they have been in service for over 40 years. There is no record of any cleaning of the ponds, so there will be some accumulation of undigestable sludge and algae.

Original Pond Design Characteristics – The original design characteristics of the treatment pond and storage pond from Table 1 of the 2005 Bracewell report are listed in Table 7 below.

TABLE 7 - OCEANA MARIN ORIGINAL POND DESIGN CHARACTERISTICS

Original Design	Treatment Pond (West Pond)	Storage Pond (East Pond)
Bottom width, feet	120	120
Bottom length, feet	240	240
Bottom area, sq. ft.	28,800	28,800
Side slopes	3:1	3:1
Surface area at 10' depth	54,000	54,000
Storage volume @ minimum (4') depth, gallons	997,000	997,000
Storage volume @ maximum (10') depth*, gallons	3,052,000	3,052,000
Aerators (3 hp each), number	2	0
Aeration capacity @ 2 lbs O_2/hp-hr	288	0

*Design freeboard when pond full = 2'

Pond Operation – The pond operation strategy involves using the disposal field during dry periods to lower the pond levels and maximize the available storage prior to rainy periods so the disposal field can rest and not become waterlogged.

If work has to be done on one of the ponds it should be possible to take it out of service by diverting the incoming flow to the other pond. Ideally this diversion should be done during dry weather when the incoming flows are low. This diversion would require installation of some temporary piping.

Treatment Pond Loading – Treatment ponds for domestic wastewater are generally designed to provide 30 day detention and a conservative organic loading of 35# to 50# BOD/acre/day. The pond detention times are much longer than 30 days as given in Table 8 below.

TABLE 8 - TREATMENT POND DETENTION TIMES VERSUS ANNUAL FLOWS

	Existing 229 homes	Build-out 300 homes
Dry year wastewater flow, gallons	6,475,000	8,074,000
Detention time, pond full (3,052,000 gal)	172 days	138 days
Detention time, pond half full	86 days	69 days
Wet year wastewater flow, gallons	7,475,000	9,074,000
Detention time, pond full (3,052,000 gal)	149 days	123 days
Detention time pond half full	75 days	62 days

The organic loading at full buildout of 300 homes with an assumed 44% occupancy and 2.5 persons per home and 0.17# BOD5/person calculates to be 56# BOD5/day. This represents a BOD5 loading of 45#/day when the pond is full, which is within the general design guidelines for a treatment pond. The aeration and excessively long detention times serve to further reduce the organic loading. The storage pond provides additional detention time which further reduces the organic loading with natural processes. This second pond provides polishing of the effluent prior to injection into the disposal field.

As a conclusion the treatment and storage ponds are well within design guidelines for the loading they receive now and at full buildout.

Berm Erosion – Some of the pond berms are eroding, probably from wind generated waves. The wind is primarily from the northwest which means that the southern and east berms are most eroded. The eroded soil has moved into the ponds and reduced their capacity.



Treatment Pond

If the ponds remain unlined at least the south and east berms should be stabilized. There are different ways to stabilize the banks. Stabilization can be "natural stabilization" by planting vegetation such as willows and cattails. However, this can make the ponds more difficult to maintain and control. An engineering bank stabilization approach can involve placing rip rap over a geofabric or geofabric placed over berms restored with compacted soil.

For budgeting purposes the cost of placing rip rap over stabilizing fabric on the upper 10 feet of all four berms around one pond, totaling 26,000 square feet, is given below.

P-1A & 1B - Pond Berm Repair using Rip Rap over Stabilization Fabric

Mobilization, bank preparation		$12,000
8 rolls Stabilization geofabric	@$500/roll	4,000
1,600 tons rock rip rap in place	@$125/ton	200,000
Labor		20,000
Miscellaneous		12,000
Subtotal		248,000
Contingencies and Incidentals (35%)		87,000
TOTAL ESTIMATED CONSTRUCION COST		$335,000

This cost is for stabilizing all four berms on one pond or stabilizing two berms on both ponds. Stabilization of all four berms on both ponds is estimated to cost $670,000.

An alternate, less expensive strategy which has been used on other ponds involves placing fabric and rip rap on the worst eroded sections. This can be done in sections over the years as the budget allows and would keep the protected berms from eroding to the point that threatens its structural integrity.

Pond Dredging – NMWD staff took soundings of the two ponds on May 20, 2015 and found that the ponds have silted in approximately a third of their depth. . This accumulated material will consist of the soil eroded from the eroded pond berms and accumulated sludge and dead algae. The pond soundings are shown in Appendix F and the depth and estimated volume of the sediment is given in Table 9 below.

TABLE 9 – ESTIMATED POND SEDIMENT DEPTH AND VOLUME

	Treatment pond	Storage pond
Average depth of sediment/sludge, feet	3.4	2.4
Est. volume of sediment/sludge, cubic yards	4,000	2,800

The minimum design water depth for the two ponds is 4' so the sediment/sludge has taken up most of this reserve. Although it appears that the ponds have lost storage volume the sediment eroded from the berms has settled in the pond bottom and the berm slopes have been reconfigured making the storage volume essentially the same when the pond is full. The storage volume is gone from the lower 2 to 3 feet of the ponds because of the sediment but there will be more storage volume available at the higher levels because of the eroded upper berms. However, to make use of the upper storage volume means that the water level in the ponds must be kept higher which will make the berms more vulnerable to further wind erosion.

The treatment pond appears to have about 1,200 cubic yards more of sediment/sludge than the storage pond, which could be caused by more erosion of the berms and/or an accumulation of undigested sludge and algae over its 40+ years of operation.

We contacted several companies which do pond dredging. Dredging can be done in several ways. One company would use a floating suction pump so the pond would need enough water in it to float the pump. The sludge slurry would either be pumped to another pond to eventually dry out or it can be mechanically dewatered so it can be trucked to a disposal site. Mechanical dewatering can involve a belt filter press using polymers or a large filter bag. If the dewatered sludge is to be trucked away it should be as dry as possible to minimize the trips and disposal costs. Mechanical dewatering may dewater the sludge to 25% solids, which means that 75% remains as water. Hauling to the Redwood Landfill together with their tipping fees would make this alternative even more expensive.

A local contractor, Poncia Fertilizer, cleans out small ponds for dairies and wineries and does work for the City of Santa Rosa. Without looking at the job site Andy Poncia estimated that if the ponds are dewatered as well as they can be he could use a long reach excavator and mud cat to load the sediment/sludge material to two on-site trucks to take it to a nearby disposal area, possibly on NMWD property adjacent to the existing ponds. His estimate for this work was $35,000 per pond. If the sludge/sediment had to be hauled to Redwood Landfill he estimates the trucking cost would be $125,000 per pond plus the tipping fees. He thought that the sediment/sludge from the pond would be too wet to be used to restore the eroded berms.

At Oceana Marin it may take several months to dry out the ponds so the sediment has a sufficiently low moisture level to allow it to be scooped up and trucked away without a lot of dripping and extra tipping fees. If the pond is going to be lined as described below it will need to be dried out so it can be graded smooth. During the drying period the storage pond will need to be used for treatment and it will be important that the effluent does not contain too much suspended material that might clog the leach lines in the disposal field.

Since this is a sewage pond, disposal of the sludge will need to conform to the requirements of EPA Part 503 Biosolids Rule (EPA/R-92/013). This rule is mainly concerned with heavy metals, stabilization of pathogens and attraction of vectors. Tests will need to be made for heavy metals, but since the sludge is from a residential area there should not be a problem. Stabilization of pathogens can be achieved by holding the sludge for a matter of time and vector attraction relates to how the sludge is handled.

In West Marin there is a lot of agricultural land and a land owner might want to accept the dredged material from the ponds. This will require permitting. If the sludge must be hauled to an appropriately permitted landfill it will probably have to go to the Redwood Landfill north of Novato. This is at least a 2 hour round trip. Per an email dated 6/29/15 from Waste Management the disposal cost pricing for this project will be $21.00 per ton with taxes and fees included if the soil qualifies for daily cover and $47.00 per ton with taxes and fees included if it is approved for disposal. If the sludge is not dewatered very well the total tipping fee will be high because the tonnage will include the water.

In order to dispose of the sediment/sludge on-site it will be necessary to excavate another pond nearby or find a local farmer who could accept the material. Both of these will require appropriate permits. Even disposal at the Redwood landfill will require testing of the material to make sure it does not contain heavy metals or other hazardous materials.

An onsite sediment holding pond could be constructed on NMWD property north of the existing ponds. The volume of this new pond will depend on the method of dewatering and whether or not the sediment will have a high water content. For the purpose of the cost estimate it is assumed that the holding pond will have a volume of 8,000 cubic yards which will hold an estimated 4,000 cubic yards of sediment from the treatment pond initially and then an additional 2,800 cubic yards from the storage pond. After the passage of time this material could be removed and spread out on adjacent land to make room for the next pond dredging if necessary.

The 8,000 cubic yard sediment holding pond would have the dimensions of approximately 140' x 200' x 8' deep with 1:1 or 1.5:5 sloping banks. The top 12" of soil which contains the organic material would be scarified, stripped off and placed on adjacent land. The lower material would be reserved in a separate pile to be used to reconstruct the slope of the pond berms.

As a caution the original 1972 plans for the pond construction show a "3" PVC and cables" running through the southwest corner of the west pond (treatment pond). The plans show a shallower excavation over these utilities to provide 30" of cover. According to the assessor's maps these utilities may run between two wells owned by the Estero Mutual Water Co. Any excavation work to clean out this pond will need to be careful not to damage these utilities or they should be relocated out from under the pond. In the estimate below it is assumed that the 3" PVC and cables will be relocated out of NMWD property, which may require a new easement on the adjacent private property.

Alternative A – Pond dredging using a holding pond for onsite disposal of the sediment

Project P-2A – Dredging of Treatment Pond (first pond)

Mobilization			$15,000
Relocation of 3" PVC and cables	630 LF	@ $80/LF	50,400
Construct sediment holding pond	8,000 cy	@ $6/cy	48,000
Dredge pond			35,000
Wooden Pier for support of instrumentation			15,000
Subtotal			163,400
Permitting cost			50,000
Contingencies and Incidentals (35%)			57,600
TOTAL ESTIMATED CONSTRUCTION COST			$271,000

Project P-2B - Dredging of Storage Pond (second pond)

Mobilization	$5,000
Dredge pond	35,000
Wooden piers for access to the valve and instrument support	20,000
Subtotal	60,000
Contingencies and Incidentals (35%)	21,000
TOTAL ESTIMATED CONSTRUCTION COST	$81,000

The total estimated cost for dredging the two ponds including construction of a nearby holding pond for the sediment is $352,000.

As an alternative project the sediment/sludge could be hauled to the Redwood landfill for disposal so that the sediment holding pond would not need to be constructed. However, there will be trucking costs and tipping fees. The estimated cost for pond dredging, hauling and disposal at the Redwood Landfill, assuming an average tipping fee of $47/ton, is given below.

Alternative B – Pond dredging with sediment disposal at the Redwood Landfill

Relocation of 3" PVC and cables	630 LF	@ $80/LF	$50,400
Dredge and haul sludge from the treatment pond (est. 4,000 cy)			125,000
Dredge and haul sludge from the storage pond (est. 2,800 cy)			125,000
Redwood landfill tipping fees	11,000 tons	@ $47/ton	517,000
Subtotal			817,400
Contingencies and Incidentals (35%)			286,600
TOTAL ESTIMATED CONSTRUCTION COST			$1,104,000

The hauling of the sediment and tipping fees at the Redwood Landfill make this alternative very expensive. Furthermore, if the ponds are dredged and the sludge/sediment is hauled to the Redwood landfill there will be no stockpile of excavated material from the holding pond excavation to be used to restore the pond berms. This soil would need to come from a separate excavation unless new soil is hauled in, which would be an added cost.

Pond Lining – The existing treatment and storage ponds are unlined. Ponds can be lined with a plastic material which can extend up the slope of the surrounding berms. A liner will prevent any exfiltration of water from the ponds and also prevent erosion of the berms.

In order to restore the berm slope so that the pond liner can be installed the pond will need to be dewatered and the sludge and sediment will need to be removed as described above. Before installing the liner the pond will need to be dry with smooth sides and no angular rock that may puncture the liner. A geofabric under the liner will provide some protection against rocks.

The various types of liners available include reinforced polypropylene, hypalon, low density or high density polyethylene and PVC. Reinforced polypropylene and hypalon have the best resistance to UV degradation. Reinforced polypropylene is seamed together with a hot wedge welder. The estimated cost of installing a pond liner in one of the ponds, assuming dimensions of the top of the berms are 300' x 180' is given below.

Pond Lining (300' x 180') – one pond

Mobilization			$10,000
Bank restoration and fine grading	3,000 cy	@ $15/cy	45,000
Geofabric			15,000
Polypropylene liner			42,000
Installation			18,000
Miscellaneous			10,000
Subtotal			140,000
Contingencies and Incidentals (35%)			50,000
TOTAL ESTIMATED CONSTRUCTION COST			$190,000

The estimated cost for lining both ponds will be around $380,000. As a practical matter, in order to dry out the pond bottom and keep one pond in service during the lining process, probably only one pond could be lined in a season. This work should be done during the summer months when there is no I/I. (Reference: Carson Manufacturing Co., P.O. Box 549, Cotati, CA 94931, 1-800-423-2380, Curtis 707-795-3141; (www.carsonliners.com).

It should be noted that a percentage of the sediment in the ponds probably comes from erosion of the pond berms. A liner extending onto the berms will prevent berm erosion but sludge will still accumulate. As determined above it took 40 years for the unlined ponds to fill in by 23% with a combination of sediment from the berms and sludge. If the ponds are lined the rate of deposition of sludge only should be much lower.

A pond liner should last 30 – 40 years. The unlined ponds have gone 40 years without major repair work except for the erosion of the berms and accumulation of sediment/sludge, which is now taking up space. A major problem with a pond liner is that it makes cleaning the ponds more difficult, although there should be less sediment because the berms would not be eroding. According to Andy Poncia the usual pond cleaning methods he uses tend to tear up plastic liners, which would need to be restored after cleaning. It may be necessary to use a floating suction dredge for the cleaning of a lined pond.

Electrical Equipment – The electrical equipment at the ponds is likely 30+ years old and is obsolete. Despite this obsolescence the equipment has been well maintained. Additionally, the motor controller panel construction is quite simple and future retrofitting of failed components within the existing controller compartments can likely be performed without too much difficulty. NMWD personnel reported that reliability of the electrical equipment at this site has been very good and no operational issues currently exist.

The PLC panel at this site is essentially new and in very good condition. NMWD personnel stated that this equipment is working well and no operational issues exist at this time.

Project P-3 – Electrical Equipment Replacement at Treatment Ponds – Due to the age of the motor controller equipment at the Treatment Ponds, it is recommended that NMWD plan for upgrading the existing electrical equipment with new components within the next 5-year time frame. The estimated cost of motor control equipment replacement at the treatment ponds is given below:

Electrical equipment replacement	$50,000
Contingencies and Incidentals (35%)	18,000
TOTAL ESTIMATED CONSTRUCTION COST	$68,000

Recommendations – It is recommended that the two ponds be dredged out and lined with a plastic liner. The most economical dredging method requires on site storage of the dredged material in an excavated holding pond. The excavated material from the holding pond will provide the necessary dirt for rebuilding the berm slopes prior to lining. Hauling the dredged out sludge to the Redwood Landfill would be very expensive.

A more expedient alternative would be to repair the eroded pond berms with rock rip-rap placed over geofabric. This could be done on an as needed basis. However it would not address the accumulated sediment and loss of storage volume in the ponds. Eventually the ponds should be dredged out and possibly lined.

The electrical equipment at the ponds is old and becoming obsolete so at some point it will need to be replaced.

EFFLUENT DISPOSAL SYSTEM

The Oceana Marin effluent disposal system consists of a pressure distribution/shallow gravel trench system. This type of system is suited for areas with high groundwater, steep slopes and low infiltration rates. Treated effluent is spread out over a wide area to enhance the infiltration and minimize the seepage to the surface. An automatic dosing siphon provides flow to the pressure distribution pipe network.



Dosing Siphon Tank

The disposal system was inspected on April 16, 2015 by Troy Pearce of AYS Engineering Group, Inc. The AYS report is included in Appendix G.



Automatic Disposal Field Valves

Disposal Field Description – The disposal field consists of 7 shallow pressure distribution leach lines located in moderately sloping terrain with shallow soils and perched seasonal ground water due to the underlying less permeable clay soils. The disposal trenches are fed by a dosing siphon with an average dose of approximately 2,200 gallons at a rate of around 25 gallons per minute. Effluent is conveyed to each of the 7 operating drain lines over 24 hours and is controlled via an irrigation control panel and automated valves. The individual drain lines average 530 feet long in trenches 1.5 feet wide with 24 inches of gravel and 8 inches of soil cover.

According to AYS the soils found in the area of the disposal field are not ideal for use as a drain field. However, with proper management this system could last for a very long time, although disposal fields can start to develop issues over time that will need to be addressed.



Disposal Field

The AYS report includes two tables of piezometer readings, one for 2003-04 and the other for 2014-15. The winter of 2003-04 was relatively wet and the winter of 2014-15 was a drought year. For 2003-04 the piezometer readings showed a relatively saturated field, whereas in 2014-15 the field was not saturated. With only two years of data there is insufficient information to make an evaluation of the capacity of the disposal field to dispose of effluent. AYS recommends that additional monitoring data be collected at more frequent intervals over a year so an evaluation can be made. It is proposed that most of this work be done by NMWD staff. The estimated cost for AYS to oversee this work is around $3,000.

Recommendations – Based on the AYS Report the following are recommendations for improvements to the disposal field and its operation.

1. Undertake additional monitoring of the piezometer levels and rainfall data which will provide insight to the operation of the system and provide data to establish the disposal capacity of the existing disposal system. The estimated cost for AYS to oversee this effort is $3,000.

2. Continue to maintain the fencing to keep the cows out of the disposal field area so the trenches don't get compacted.

3. Have a geotechnical engineer review the slide downslope of Line #1 to determine if the slide may have been caused by the use of the area above as a drain field.

4. Make the minor corrective work to the boxes that have been damaged by the cattle.

5. Undertake a trial to reduce the time each line is in service from 24 hours to 12 hours while increasing the monitoring to twice weekly. During this time take one of the lines out of service for a month to allow it to rest while monitoring the remaining field to see how the increase in effective loading is being tolerated.

6. Begin to prepare a system upgrade/failure plan for the disposal field in which new lines would be installed between the existing lines, which have wide spacing. The spreadsheet monitoring of the piezometers will be very useful in developing this plan. The cost for this project would have to be determined at a later date.

Although the existing effluent disposal system has functioned well there are some minor corrective actions which should be undertaken. It is recommended that the frequency of monitoring of the piezometers be increased to provide insight to the operation of the system and provide data to establish the disposal capacity of the existing disposal system.

It is also recommended that NMWD begin preparation of a system upgrade/failure plan for the disposal field in which new lines would be installed between the existing lines, which have wide spacing. The cost of this upgrade plan is yet to be determined.

RECOMMENDED ADDITIONAL STUDIES

In addition to the capital improvement projects described above it is recommended that NMWD undertake the following additional studies:

Project ST-1 – Electrical Power System Arc Flash Hazard Study – Arc flash hazard warning labels are required by NFPA 70E for power distribution equipment to enhance maintenance personnel safety. Modeling the existing power distribution systems at the Oceana Marin Pump Station and Treatment Pond sites will involve comprehensive field investigation to determine existing power system equipment ratings, connections, conductor sizes and conductor lengths. Once the systems are modeled within the software, short circuit analyses are performed to determine if the existing, installed equipment is adequately rated to withstand a fault condition at any point in the power system. After the short circuit analyses are completed, protective device coordination studies and arc flash hazard studies will be performed simultaneously to optimize system protection while minimizing arc flash hazard at all points in each system. Arc flash hazard warning labels are a code requirement. It is recommended that the District initiate the development of this labeling immediately to warn maintenance personnel about potentially dangerous locations within each facility with respect to electrical equipment arc flash hazard. The estimated cost for the Project ST-1 electrical power system studies is $25,000.

Project ST-2 – Site Reconnaissance of Geologic Hazard Along Ocean Bluff and Slide Below Effluent Disposal Field – It is recommended that NMWD undertake a preliminary study of the geologic hazard along the ocean bluff in the vicinity of the backyard sewer along Kailua Way and the main pump station. This would be a preliminary evaluation to determine if there is need for further investigations. Scott Stephens of Miller Pacific Engineering Group in Novato provided a budget for a geologic and geotechnical evaluation pand opinions on a conceptual level for these two features of $3,300.

Project ST-3 – Oversee Monitoring of the Disposal Field Piezometers – Oversee additional piezometer monitoring by AYS for an estimated cost of $3,000.

LONG RANGE IMPROVEMENT MASTER PLAN

The recommended Long Range Improvement Master Plan for the Oceana Marin wastewater system is shown in Figure 2 and includes an estimated $3.12 million dollars of improvements to the following facilities:

- Sewer collection system improvements primarily to reduce I/I
- Improvements to the main Oceana Marin pump station to improve its reliability and redundancy

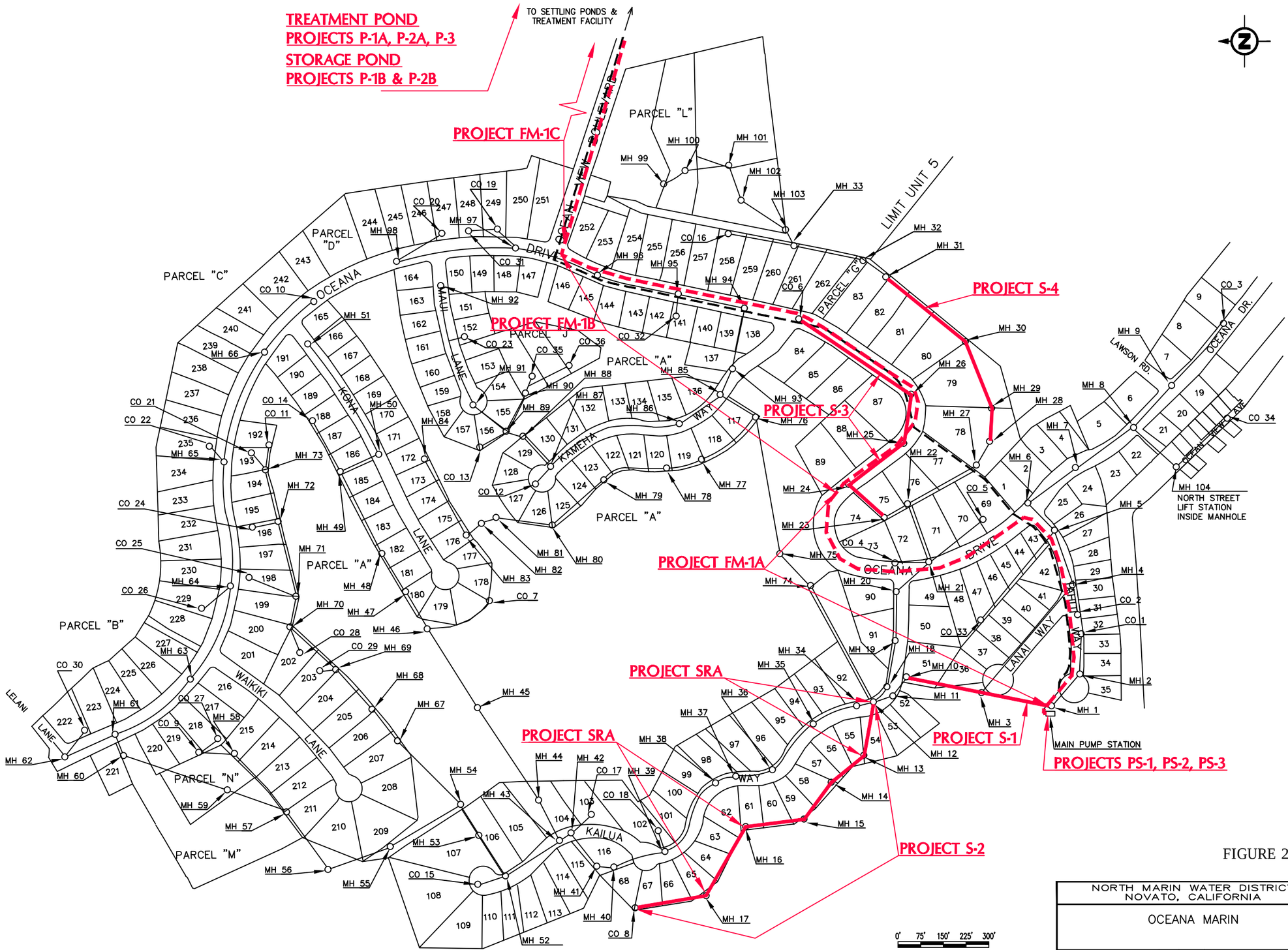


FIGURE 2

NORTH MARIN WATER DISTRICT NOVATO, CALIFORNIA			
OCEANA MARIN			
DATE CREATED:	BY:		SCALE: 1" = 150'
REVISION DATE:	BY:		DRAWING NO.
APPROVED DATE:	BY:		

Dec 04, 2015 - 12:09pm L:\District\NMWD\8464 Oceana Marin Long Range Plan\OM Sewer System CCTV Map.dwg User: PRISCILLA

- Force main improvements consisting of construction of a second force main to provide redundancy
- Dredging and possibly lining of the treatment and storage ponds to eliminate berm erosion
- Electrical power system arc flash hazard study
- Study of the effluent disposal system to assess its ability to dispose of the treated effluent
- Site reconnaissance of geologic hazard of ocean bluff and slide below effluent disposal field
- Additional studies of different aspects of the wastewater system

Priorities have been assigned to these projects in the following order:

- Improve unit process functioning
- Improve critical reliability and redundancy
- Reduce I/I from the sewer system

The list of improvement projects and their assigned priorities is given in Table 10 below.

It is recommended that NMWD begin to budget for these improvements to the Oceana Marin sewer system.

TABLE 10 – CAPITAL IMPROVEMENT PROGRAM PRIORITIES AND ESTIMATED PROJECT COSTS

Project Desig.	Description	Priority		
		High	Medium	Low
SEWER IMPROVEMENT PROJECTS				
S-1	Pump Station to Kailua Way: MH through MH 3 to MH 10 Kailua Way (477 feet)		$48,300	
S-2	Kailua Way Ocean Side: MH 12 thru MH 13, MH 14, MH 15, MH 16, MH 17 to CO 8 (1125')		$114,000	
S-2A Optional	Kailua Way Segment Replacement: MH 12 to MH 13 and MH 16 to MH 17 (380')			$102,000

Project Desig.	Description	Priority		
		High	Medium	Low
S-3	Ocean Drive CIPP Lining: MH 23 to MH 24 (Oceana Drive) thru MH 25, MH 26, to CO 6 (1,005')		$108,000	
S-4	Ocean Drive Rear Easement: MH 28 thru MH 29, MH 30, to MH 31 (933')		$94,000	
PUMP STATION IMPROVEMENT PROJECTS				
PS-1	Miscellaneous Reliability Upgrades	$43,000		
PS-2	Oceana Marin Pump Station PG&E Meter/Main Replacement	$30,000		
PS-3	Relocation of Electrical Equipment to Aboveground Block Building	$190,000		
FORCE MAIN IMPROVEMENT PROJECTS				
FM-1A	Pump Station to 360 Oceana Drive	$548,000		
FM-1B	360 Oceana Drive to Ocean View Blvd.		$382,000	
FM-1C	Ocean View Blvd to Treatment Ponds			$340,000
POND IMPROVEMENTS				
P-1A	Treatment Pond Berm Repair with Riprap	$335,000		
P-1B	Storage Pond Berm Repair with Riprap		$335,000	
P-2A	Dredging of Treatment Pond (first pond)	$271,000		
P-2B	Dredging of Storage Pond (second pond)		$81,000	
P-3	Electrical Equipment Replacement at Treatment Ponds		$68,000	
DISPOSAL FIELD IMPROVEMENTS			TBD	
STUDIES				
ST-1	Electrical Power System Arc Flash Hazard Studies	$25,000		
ST-2	Site Reconnaissance of Geologic Hazard along Ocean Bluff and Slide Below Effluent Disposal Field	$3,300		
ST-3	Disposal field piezometer Study	$3,000		
	TOTAL ESTIMATED COSTS	**$1,448,300**	**$1,230,300**	**$442,000**

APPENDIX A

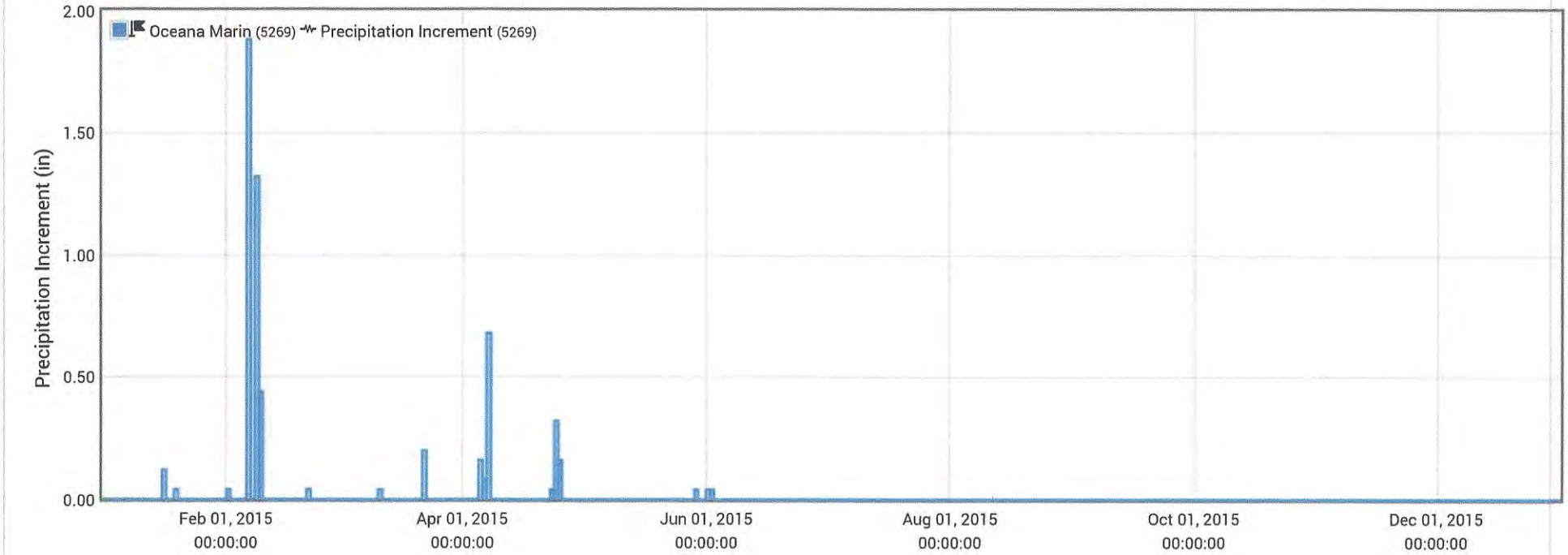
COUNTY OF MARIN
Rainfall Data 2010-2015

COUNTY OF MARIN

Home / Sites / Oceana Marin (5269) / Precipitation Increment (5269) / Graph

Precipitation Increment (5269)

January 1, 2015 - December 31, 2015



COUNTY OF MARIN

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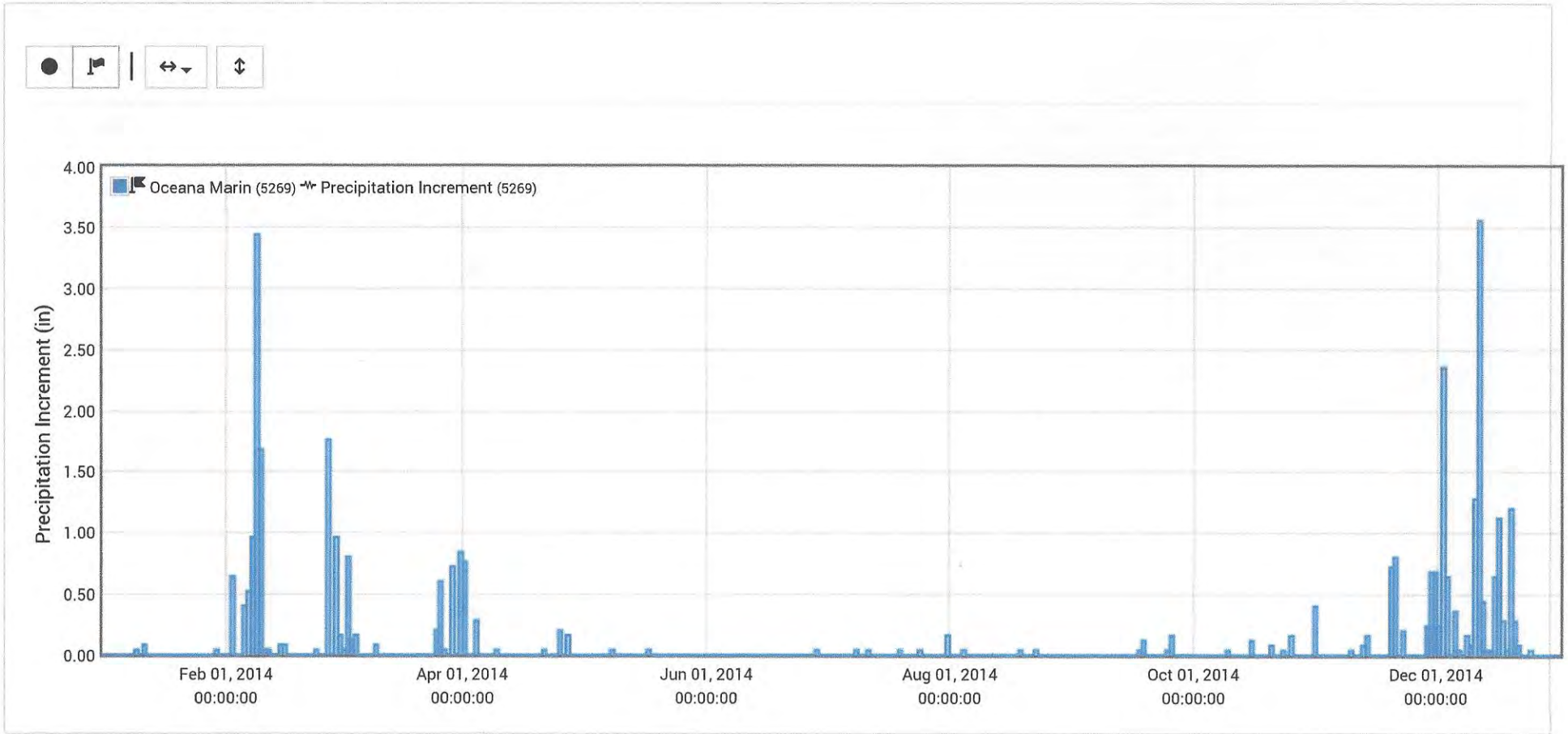
Precipitation Increment (5269)

January 1, 2014 - December 31, 2014



COUNTY OF MARIN

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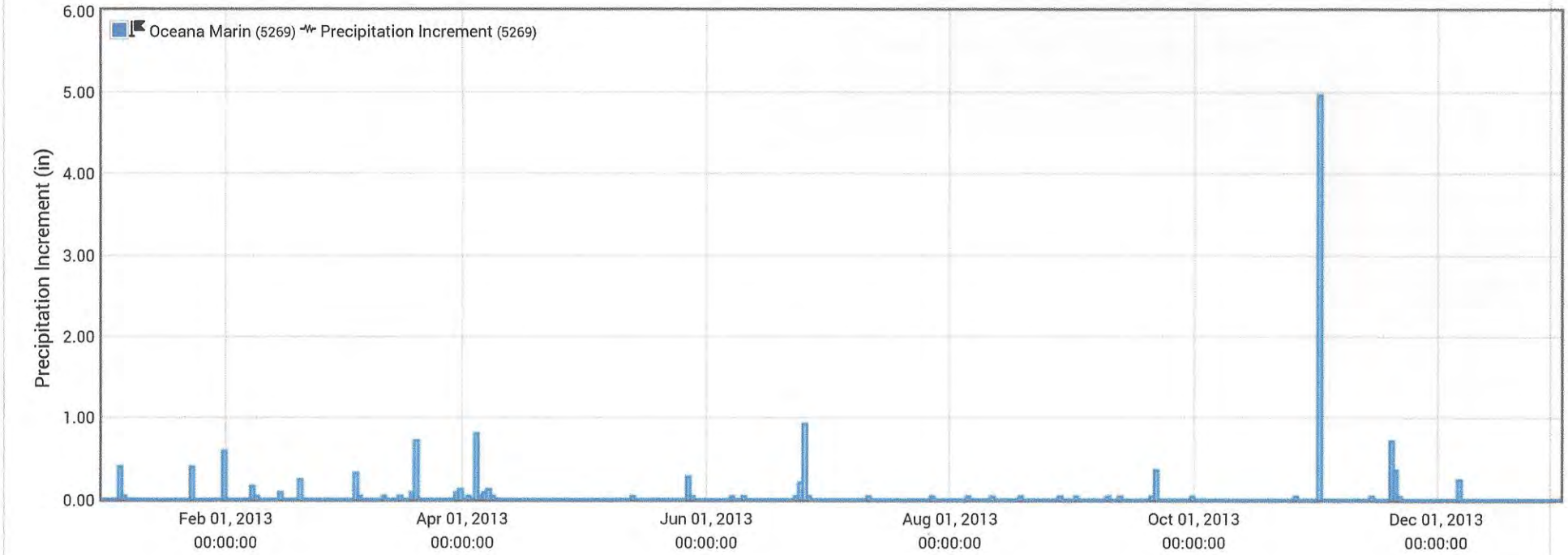
Precipitation Increment (5269)

January 1, 2013 - December 31, 2013

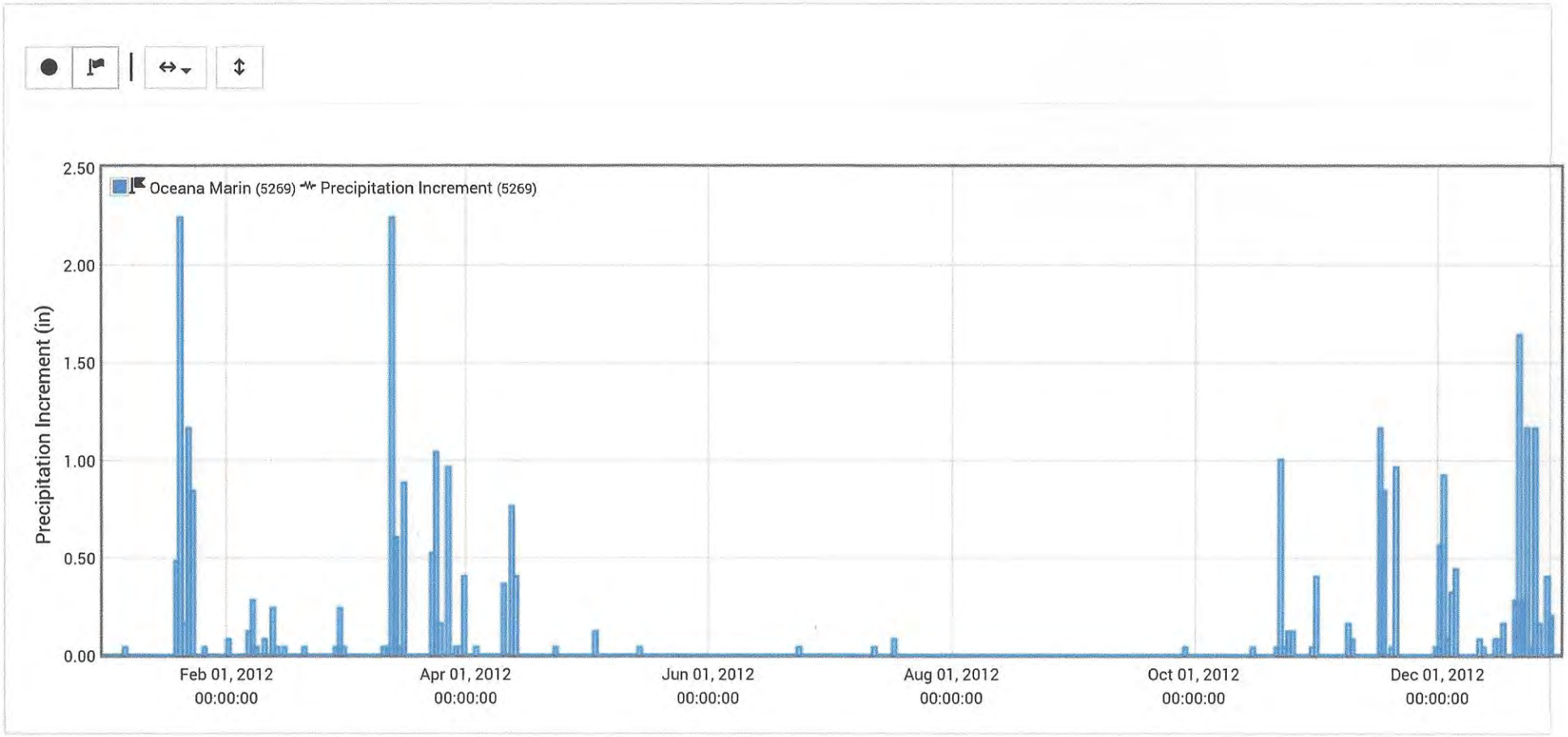


COUNTY OF MARIN

Home / Sites / Oceana Marin (5269) / Precipitation Increment (5269) / Graph

Precipitation Increment (5269)

January 1, 2012 - December 31, 2012

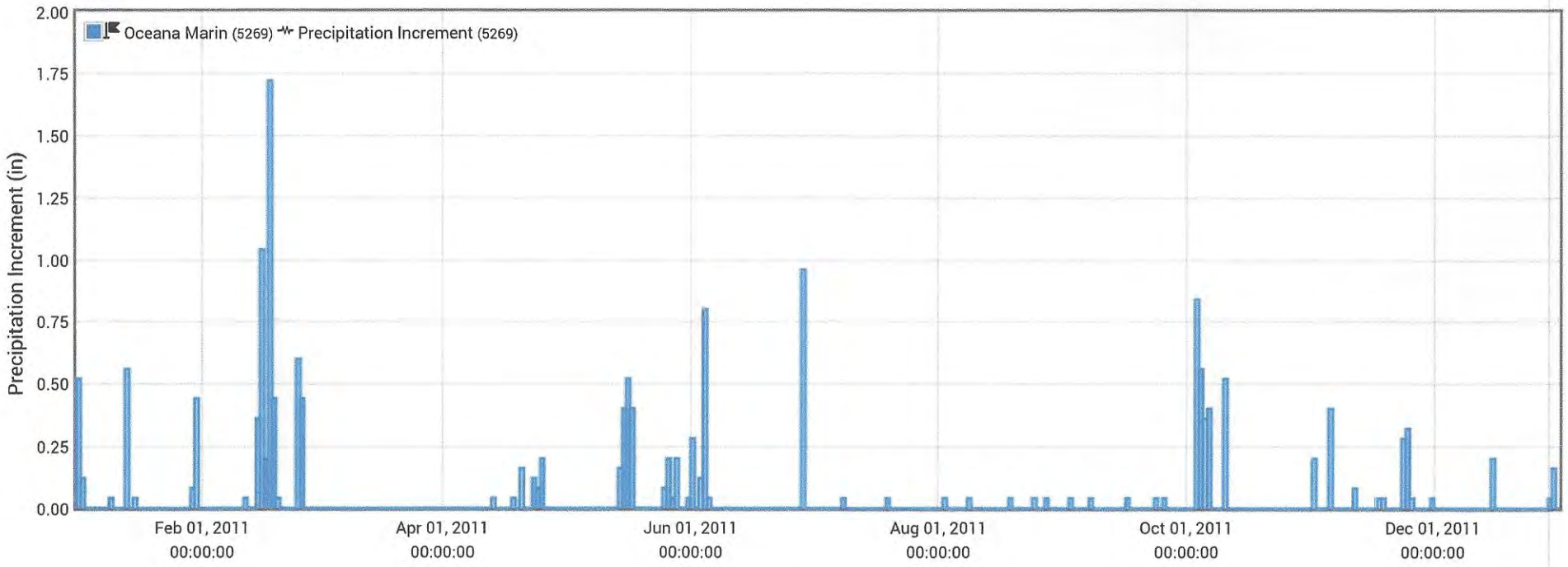


COUNTY OF MARIN

Home / Sites / Oceana Marin (5269) / Precipitation Increment (5269) / Graph

Precipitation Increment (5269)

January 1, 2011 - December 31, 2011

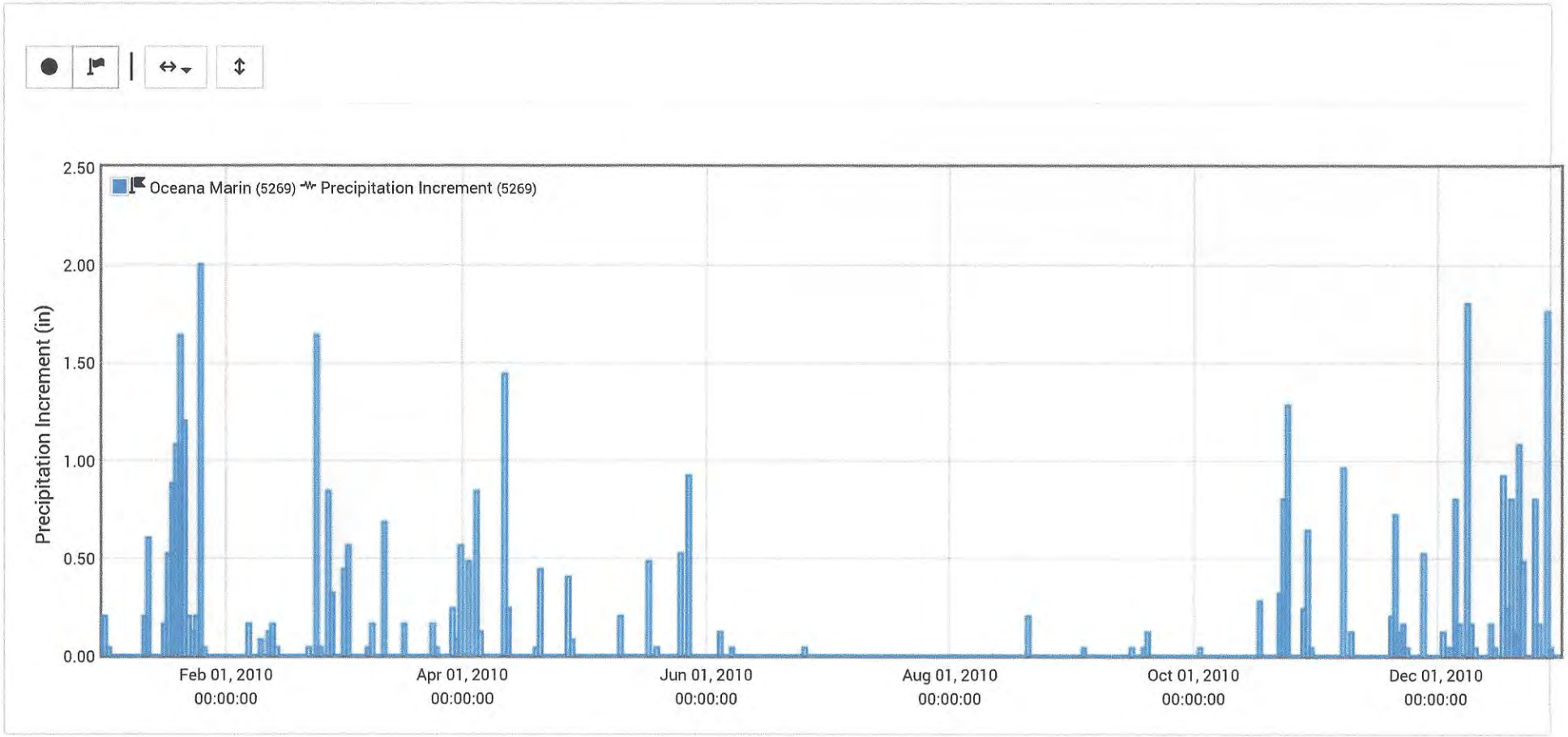


COUNTY OF MARIN

Home / Sites / Oceana Marin (5269) / Precipitation Increment (5269) / Graph

Precipitation Increment (5269)

January 1, 2010 - December 31, 2010



APPENDIX B

WASTE DISCHARGE REQUIREMENTS FOR OCEANA MARIN Order No. 92-57

California Regional Water Quality Control Board
North Coast Region

ORDER NO. 92-57
ID NO. 1B80173MAR

WASTE DISCHARGE REQUIREMENTS

FOR

NORTH MARIN WATER DISTRICT
OCEANA MARIN

Marin County

The California Regional Water Quality Control Board, North Coast Region (hereinafter the Board), finds that:

1. The North Marin Water District (hereinafter referred to as the discharger) submitted a report of waste discharge on March 21, 1991. The report of waste discharge was considered complete after the discharger submitted additional information on November 20, 1991.

2. The discharger owns and operates the wastewater treatment and disposal facilities for the Oceana Marin Subdivision in the SE 1/4 of Section 21, T5N, R10W, MDB&M near the community of Dillon Beach in Marin County as shown on Figure 1. The effluent disposal facilities lie within the watershed of the Estero de San Antonio.

3. The treatment and disposal facilities at Oceana Marin consist of an aerated pond followed by a storage pond. Solids are retained and reduced in the aerated pond. This facility has no sludge handling facility. Disinfected secondary effluent is disposed using a shallow trench, pressure distribution system. The majority of the wastewater is discharged to the disposal system during the dry summer months. Additional disposal may occur during dry periods in the winter. The projected maximum rate of effluent disposal to the pressure distribution system is 53,000 gallons per day.

4. The Board adopted Water Quality Control Plans for the Klamath River Basin (1A) and the North Coastal Basin (1B) on March 20, 1975. The Klamath River Basin Plan (1A) was combined with the North Coastal Basin Plan (1B) to form the Water Quality Control Plan for the North Coast Region. The Plan for the North Coast Region was adopted by the Board on April 28, 1988 and approved by the State Water Resources Control Board on November 15, 1988. The Plan includes water quality objectives and receiving water limitations.

5. The beneficial uses of the Estero de San Antonio and its tributaries include:

   a. municipal and domestic supply

b. agricultural supply
c. water contact recreation
d. noncontact water recreation
e. ocean commercial and sport fishing
f. wildlife habitat
g. marine habitat
h. fish spawning
i. shellfish harvesting

6. The beneficial uses of areal groundwaters include:

a. domestic water supply
b. agricultural water supply

7. The discharge is presently governed by Waste Discharge Requirements, Order No. 86-49, adopted by the Board on April 10, 1986.

8. This project consists of the operation or minor alteration of an existing facility which involves minimum change in use beyond that previously existing. Furthermore, a negative declaration for construction and operation of the disposal facilities was prepared and approved by the North Marin Water District on September 18, 1990. The Board has determined that compliance with this Order will mitigate any potential adverse water quality impact.

9. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations.

10. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

THEREFORE, IT IS HEREBY ORDERED that Waste Discharge Requirements, Order No. 86-49 are rescinded and the discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. The discharge of waste to land that is not under the control of the discharger is prohibited.

2. The discharge of any waste not specifically regulated by this Order is prohibited.

3. Creation of a pollution, contamination, or nuisance, as defined by Section 13050 of the California Water Code (CWC), is prohibited. [Health and Safety Code, Section 5411]

4. The discharge of untreated waste from anywhere within the collection, treatment, or disposal facility is prohibited.

5. The discharge of waste from the Oceana Marin Wastewater Treatment and Disposal Facilities to the Estero de San Antonio or its tributaries is prohibited.

6. The discharge of waste to the surface of the ground is prohibited.

B. DISCHARGE SPECIFICATIONS

1. The maximum daily discharge to the disposal system shall not exceed 53,000 gallons per day.

2. Wastes discharged to the disposal system shall not contain constituents in excess of the following limits:

Constituent	Units	Mean	Maximum
BOD (20°C, 5-day)	mg/1	50*	80
Nonfilterable Residue	mg/1	50*	80
Coliform Organisms	MPN/100 ml	--	230

3. The discharge shall not impart taste, odor, or color to areal groundwater.

* The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days.

C. PROVISIONS

1. A copy of this Order shall be maintained at the discharge facility and be available at all times to operating personnel.

2. Severability

Provisions of these waste discharge requirements are severable. If any provision of these requirements is found invalid, the remainder of these requirements shall not be affected.

3. Operation and Maintenance

The discharger must maintain in good working order and operate as efficiently as possible any facility or control system installed by the discharger to achieve compliance with these waste discharge requirements.

4. Change in Discharge

The discharger must promptly report to the Board any material change in the character, location, or volume of the discharge.

5. Change in Ownership

In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the discharger, the discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which must be forwarded to the Board.

6. Vested Rights

This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, nor protect the discharger from his liability under federal, State, or local laws, nor create a vested right for the discharger to continue the waste discharge.

7. Monitoring

The discharger must comply with the Contingency Planning and Notification Requirements Order No. 74-151 and the Monitoring and Reporting Program No. 92-57 and any modifications to these documents as specified by the Executive Officer. Such documents are attached to this Order and incorporated herein. Chemical, bacteriological, and bioassay analyses must be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the discharger, analyses performed by a noncertified laboratory will be accepted provided:

a. A quality assurance/quality control program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and available for inspection by staff of the Board. The quality assurance/quality control program must conform to EPA guidelines or procedures approved by the Board.

b. The laboratory will become certified within the shortest practicable time if the State Certification Program is resumed.

8. Inspections

The discharger shall permit authorized staff of the Board:

a. entry upon premises in which an effluent source is located or in which any required records are kept;

b. access to copy any records required to be kept under terms and conditions of this Order;

c. inspection of monitoring equipment or records; and

d. sampling of any discharge.

9. Noncompliance

In the event the discharger is unable to comply with any of the conditions of this Order due to:

a. breakdown of waste treatment equipment;
b. accidents caused by human error or negligence; or
c. other causes such as acts of nature;

the discharger must notify the Executive Officer by telephone as soon as he or his agents have knowledge of the incident and confirm this notification in writing within two weeks of the telephone notification. The written notification shall include pertinent information explaining reasons for the noncompliance and shall indicate what steps are being taken to prevent the problem from recurring.

10. Revision of Requirements

The Board requires the discharger to file a report of waste discharge at least 120 days before making any material change or proposed change in the character, location, or volume of the discharge.

11. Operator Certification

Supervisors and operators of municipal wastewater treatment plants shall possess a certificate of appropriate grade in accordance with Title 23, California Code of Regulations, Section 3680. The State Board may accept experience in lieu of qualification training. In lieu of a properly certified wastewater treatment plant operator, the State Board may approve use of a water treatment plant operator of appropriate grade certified by the State Department of Health Services where reclamation is involved.

12. Adequate Capacity

Whenever a publicly owned wastewater treatment plant will reach capacity within four years, the discharger shall notify the Board. A copy of such notification shall be sent to appropriate local elected officials, local permitting agencies, and the press. The

discharger must demonstrate that adequate steps are being taken to address the capacity problem. The discharger shall submit a technical report to the Board showing how flow volumes will be prevented from exceeding capacity, or how capacity will be increased, within 120 days after providing notification to the Board, or within 120 days after receipt of Board notification, that the POTW will reach capacity within four years. The time for filing the required technical report may be extended by the Board. An extension of 30 days may be granted by the Executive Officer, and longer extensions may be granted by the Board itself. (CCR Title 23, Section 2232)

13. The discharger shall comply with the following time schedule to assure compliance with the terms and conditions of this Order:

	Task	Date
a.	Implement a study program to develop a long-term wastewater treatment and disposal plan for the Oceana Marin Subdivision.	August 1, 1992
b.	Select and complete a long-term master plan for wastewater treatment and disposal. This plan shall include a time schedule for implementation of the long-term master plan.	May 1, 1994

Certification

I, Benjamin D. Kor, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on June 25, 1992.

Benjamin D. Kor
Executive Officer

(wdromarin)

California Regional Water Quality Control Board
North Coast Region

MONITORING AND REPORTING PROGRAM NO. 92-57

FOR

NORTH MARIN WATER DISTRICT
OCEANA MARIN SUBDIVISION

Marin County

INFLUENT MONITORING

Constituent	Units	Sampling Frequency
Average Daily Flow	Gallons per Day	Continuously

DISPOSAL FIELD MONITORING

During periods when wastes are discharged from the Oceana Marin Treatment System to the effluent disposal field, water level measurements shall be taken weekly in monitoring wells located in the disposal field. The monitoring well locations shall be approved by the Executive Officer.

EFFLUENT MONITORING

During periods when wastes are discharged fromthe Oceana Marin Treatment System to the effluent disposal field, the following monitoring shall be conducted:

Constituent	Units	Type of Sample	Sampling Frequency
BOD (20°C, 5-Day)[1]	mg/l	Grab	Monthly
Nonfilterable Residue	mg/l	Grab	Monthly
Coliform Organisms	MPN/100ml	Grab	Monthly
Chlorine Residual	mg/l	Grab	Weekly
Average Daily Flow	gpd	--	Continuously

REPORTING

Monitoring reports shall be submitted monthly by the 15th day of the following month. In reporting the monitoring data, the discharger shall arrange the data in tabular form to clearly illustrate compliance with the waste discharge requirements. In any month that no waste is discharged to the effluent disposal field, the monthly monitoring report shall specify no discharge.

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[1] COD monitoring may be substituted for BOD monitoring if the discharger can demonstrate a correlation between these parameters. This change must be approved, in writing, by the Executive Officer.

In addition to the above, the discharger shall have all flow measuring devices tested annually and their accuracy certified. This certification shall be submitted annually with the monitoring report for the month of October.

Ordered by

Benjamin D. Kor
Executive Officer

June 25, 1992

(omarin.m&r)

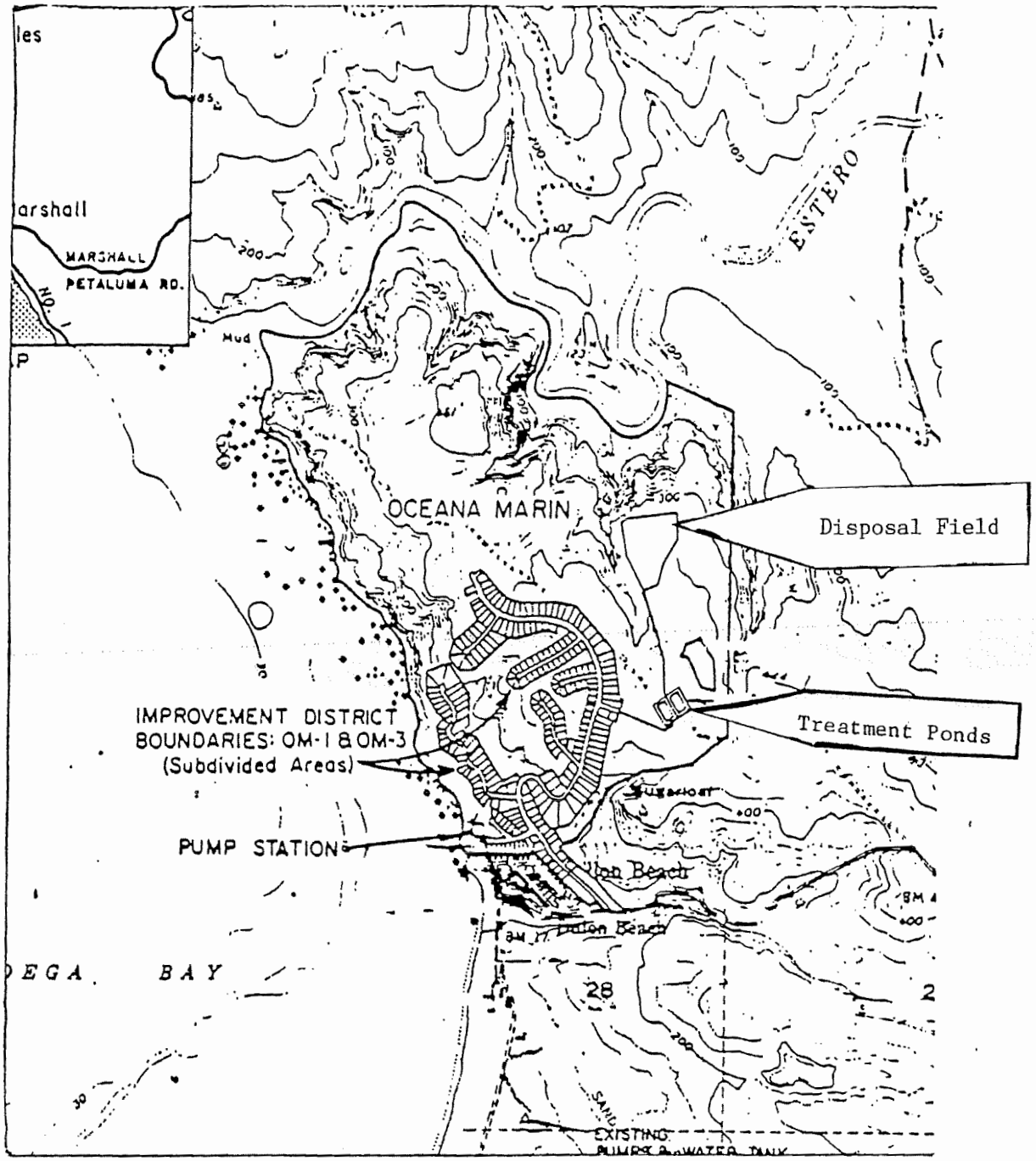

FIGURE 1

Location of Oceana Marin Wastewater Treatment and Disposal Facilities

Calif(ia Regional Water Quality Control ard
North Coast Region

CONTINGENCY PLANNING AND NOTIFICATION REQUIREMENTS

FOR

ACCIDENTAL SPILLS AND DISCHARGES

ORDER NO. 74-151

The California Regional Water Quality Control Board, North Coast Region, finds that:

1. Section 13225 of the Porter-Cologne Water Quality Act requires the Regional Board to perform general duties to assure positive water quality control.

2. The Regional Board has been advised of situations in which preparations for, and response to accidental discharges and spills have been inadequate.

3. Persons discharging waste or conveying, supplying, storing, or managing wastes or hazardous materials have the primary responsibility for contingency planning, incident reporting and continuous and diligent action to abate the effects of such unintentional or accidental discharge.

THEREFORE, IT IS HEREBY ORDERED THAT:

I. All persons who discharge wastes or convey, supply, store, or otherwise manage wastes or other hazardous material shall:

   A. Prepare and submit to this Regional Board, according to a time schedule prescribed by the Executive Officer, a contingency plan defining the following:

      1. Potential locations and/or circumstances under which accidental discharge incidents might be expected to occur,

      2. Possible water quality effects of accidental discharges,

      3. The conceptual plan for cleanup and abatement of accidental discharge incidents, including:

         a. The individual who will be in charge of cleanup and abatement activities on behalf of the discharger,

         b. The equipment and manpower available to the discharger to implement the cleanup and abatement plans,

   B. Immediately report to the Regional Board any accidental discharge incidents. Such notification shall be made by telephone as soon as the responsible person or his agent has knowledge of the incident.

   C. Immediately begin diligent and continuous action to cleanup and abate the effects of any unintentional or accidental discharge. Such action shall include temporary measures to abate the discharge prior to completing permanent repairs to damaged facilities.

D. Confirm the telephone notification in writing within two weeks of the telephone notification. The written notification shall include: reasons for the discharge, duration and volume of the discharge, steps taken to correct the problem and steps being taken to prevent the problem from recurring.

II. Upon original receipt of phone report (I.B.), the Executive Officer shall immediately notify all affected agencies and known users of waters affected by the unintentional or accidental discharge.

III. Provide updated information to the Regional Board in the event of change of staff, size of the facility, or change of operating procedures which will affect the previously established contingency plan.

IV. The Executive Officer or his employees shall maintain liaison with the discharger and other affected agencies and persons to provide assistance in cleanup and abatement activities.

V. The Executive Officer shall transmit copies of this Order to all persons whose discharges of waste handling activities are governed by Waste Discharge Requirements or an NDPES permit. Such transmittal shall include a current listing of telephone numbers of the Executive Officer and his key employees to facilitate compliance with Item I.B of this Order.

Ordered by _____
Benjamin D. Kor
Executive Officer

July 24, 1974
(Retyped February 15, 1990)

Your primary notification should be to the Regional Board office in Santa Rosa at (707) 576-2220. During off hours, you will be able to leave a recorded message at that number and, if you have a spill or discharge emergency, you will also be referred to the State Office of Emergency Services (OES) at (800) 852-7550. OES maintains a roster of key employees and will relay your notification to Regional Board staff.

California Regional Water Quality Control Board
North Coast Region

GENERAL MONITORING AND REPORTING PROVISIONS

February 3, 1971
(Retyped June 13, 1989)

GENERAL PROVISIONS FOR SAMPLING AND ANALYSIS

Unless otherwise noted, all sampling, sample preservation, and analyses shall be conducted in accordance with the current edition of "Standard Methods for the Examination of Water and Waste Water" or approved by the Executive Officer.

All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health or a laboratory approved by the Executive Officer.

All samples shall be representative of the waste discharge under the conditions of peak load.

GENERAL PROVISIONS FOR REPORTING

For every item where the requirements are not met, the discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge in full compliance with requirements at the earliest time and submit a timetable for correction.

By January 30 of each year, the discharger shall submit an annual report to the Regional Board The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the discharger shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.

The discharger shall file a written report within 90 days after the average dry weather flow for any month that equals or exceeds 75 percent of the design capacity of the waste treatment or disposal facilities. The report shall contain a schedule for studies, design, and other steps needed to provide additional capacity or limit the flow below the design capacity prior to the time when the waste flow rate equals the capacity of the present units.

APPENDIX C

OCEANA MARIN
Master Sewer List

OCEANA MARIN SEWER SYSTEM (Pipe Segments)

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PIPE SEGMENT				PHYSICAL LOCATION						PROBLEMS?							REPAIRS?	
FROM	TO	# of Upstream Services	Service rating	FROM	TO	PIPE SIZE	TYPE OF PIPE	LENGTH OF SECTION (in feet)	YEAR(s) T.V.'d	Date rating	Distance (in feet)	Direction (From MH/CO to MH/CO)	Problem Found	Wt. of Problem	Priority	Recommended Action & Date	Date	Work Done
MH 1	MH2	4	1	Approx. 38' NW from end of cul-de-sac on Tahiti Way, adjacent to lift station	Between 21 and 23 Tahiti Way, near end of cul-de-sac	6"	PVC	126.0	1-2012	2			No issues to report	0	2	TV	2019	
MH 1	MH 3	257	5	Approx. 38' NW from end of cul-de-sac on Tahiti Way, adjacent to lift station	Approx. 20' past end of cul-de-sac on Lanai Way	6"	ACP	239.5	2-2012	0	37.7	MH3 - MH1	Sag in the pipe	2	10	TV	2019	
			5							0	68.1		Infiltration in the pipe	3	15	Patch	FY13	
			5							0	116.2		Sag in the pipe	2	10	TV	2019	
			5							0	149.4		Grease in the pipe	2	10	Clean	FY13	
			5							0	181.2		Sag in the pipe	3	15	TV	2019	
MH 2	CO 1	3	1	Between 21 and 23 Tahiti Way, near end of cul-de-sac	Between 17 and 19 Tahiti Way	6"	PVC	128.0	1-2012	1	125.7	MH2 - CO1	Dirt and Rocks -- pipe has dirt and rocks at bottom	3	4	Clean	FY13	
MH 3	MH 4	43	1	Approx. 20' past end of cul-de-sac on Lanai Way	NE corner of 11 Tahiti Way	6"	PVC	449.7	1-2012	1			No issues observed	0	1	TV	2019	
MH 3	MH 10	219	5	Approx. 20' past end of cul-de-sac on Lanai Way	NW corner of 5 Kailua Way	6"	ACP	237.5	2-2012	1	59.6	MH10 - MH3	Sag in the pipe	2	11	TV	2019	
			5							1	117.3		Sag in the pipe	2	11	TV	2019	
			5							1	119.1		Joint separated in the pipe	4	21	Patch	FY13	
			5							1	151.6		Sag in the pipe	2	11	TV	2019	
MH 4	CO 2	2	1	NE corner of 11 Tahiti Way	NW corner of 15 Tahiti Way	6"	PVC		10-97, 2-12	12			No issues observed	0	12	TV	2013	
MH 4	MH5	28	2	NE corner of 11 Tahiti Way	In front of 3 Tahiti Way	6"	PVC	167.1	1-2012	1			No issues observed	0	1	TV	2019	
MH 5	MH 6	25	1	In front of 3 Tahiti Way	In front of 200 Oceana Drive	6"	PVC	146.9	1-2012	1	145.7	MH6 - MH5	Root problem in joint	3	4	Cut	FY13	
MH 5	CO 33	6	1	In front of 3 Tahiti Way	Rear of property, 267 Oceana Drive	6"	PVC	373.4	1-2012	1	315.7	MH5 - CO33	Joint Offset in the Pipe	3	4	TV	2019	
MH 6	MH 7	24	1	In front of 200 Oceana Drive	Middle of street, between 150 and 170 Oceana Drive					15			No issues observed	0	15	TV	2019	
MH 7	MH 8	19	1	Middle of street, between 150 and 170 Oceana Drive	Between 100 and 130 Oceana Drive, @ entrance to lift station	6"	PVC	238.3	1-2012	1			No issues observed	0	1	TV	2019	
MH 8	MH 9	4	1	Between 100 and 130 Oceana Drive, @ entrance to lift station	Intersection of Oceana Drive and Lawson Rd.	6"	PVC	183.8	1-2012	1			No issues observed	0	1	TV	2019	
MH 8	MH 104	12	1	Between 100 and 130 Oceana Drive, @ entrance to lift station	Intersection of Ocean View and North St Dillon Beach					15				0	15	TV	2013	
MH 104	CO34	12		Intersection of Ocean View and North St Dillon Beach	In front of 42 Ocean View Dillon Beach	6"	PVC	341.8	1-12	1			No issues observed	0	1	TV	2019	
MH 9	CO 3	2	1	Intersection of Oceana Drive and Lawson Rd.	Front of 50 Oceana Drive					15				0	15	TV	2013	
MH 10	MH 11	217	5	NW corner of 5 Kailua Way	Front of 7 Kailua Way	6"	ACP	119.0	2-2012	1			No issues observed	0	1	TV	2019	
MH 11	MH 12	216	5	Front of 7 Kailua Way	Near SW corner of 12 Kailua Way	6"	ACP	34.8	2-2012	1			No issues observed	0	1	TV	2019	
MH 12	MH 13	15	1	Near SW corner of 12 Kailua Way	On lot line, between 11 and 15 Kailua Way, near rear of properties	6"	PVC	145.8	12/08	1	128.3	MH13 - MH12	Sag in the pipe	1	2	TV	2015	
MH 12	MH 34	99	3	Near SW corner of 12 Kailua Way	In front of 12 Kailua Way	6"	ACP	60.0	2-2012	1	54.8	MH34 - MH12	Joint Offset in the Pipe	3	10	TV	2019	
											7.1		Joint separated in the pipe		7	CIP	2013	Repair with liner FY13
											110.8		~~Root problem in joint~~		0	CIP	2013	Repair with liner FY13

OCEANA MARIN SEWER SYSTEM (Pipe Segments)

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PIPE SEGMENT				PHYSICAL LOCATION							PROBLEMS?						REPAIRS?	
FROM	TO	# of Upstream Services	Service rating	FROM	TO	PIPE SIZE	TYPE OF PIPE	LENGTH OF SECTION (in feet)	YEAR(s) T.V.'d	Date rating	Distance (in feet)	Direction (From MH/CO to MH/CO)	Problem Found	Wt. of Problem	Priority	Recommended Action & Date	Date	Work Done
MH 12	MH 74	71	2	Near SW corner of 12 Kailua Way	Northern end of "vacant" lot between 6 @ 12 Kailua Way	8"	ACP	433.6	12/08	1	280.6	MH74 - MH12	~~Root problem in joint~~	3	0	CIP	2013	Repair with liner FY13
											293.6		~~Root problem in joint~~		0	CIP	2013	Repair with liner FY13
											320.3		Joint separated in the pipe		0	CIP	2013	Repair with liner FY13
											346.5		~~Root problem in joint~~		0	CIP	2013	Repair with liner FY13
											386.3		~~Root problem in joint~~		0	CIP	2013	Repair with liner FY13
											428.7		Sag in the pipe		0	CIP	2013	Repair with liner FY13
MH 13	MH 14	14	1	On lot line, between 11 and 15 Kailua Way, near rear of properties	On lot line, between 19 and 21 Kailua Way, near rear of properties	6"	PVC	165.6	12/08	1	165.6	MH14 - MH13		0	1	TV	2015	
MH 14	MH 15	11	1	On lot line, between 19 and 21 Kailua Way, near rear of properties	Rear of property, 23 Kailua Way	6"	PVC	142.8	12/08	1	57.8	MH15 - MH14	Root in lateral	2	3	TV	2015	
MH 15	MH 16	9	1	Rear of property, 23 Kailua Way	NW corner, rear of property, 27 Kailua Way	6"	PVC	189.9	12/08	1	189.9	MH16 - MH15		0	1	TV	2015	

OCEANA MARIN SEWER SYSTEM (Pipe Segments)

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PIPE SEGMENT				PHYSICAL LOCATION								PROBLEMS?						REPAIRS?
FROM	TO	# of Upstream Services	Service rating	FROM	TO	PIPE SIZE	TYPE OF PIPE	LENGTH OF SECTION (in feet)	YEAR(s) T.V.'d	Date rating	Distance (in feet)	Direction (From MH/CO to MH/CO)	Problem Found	Wt. of Problem	Priority	Recommended Action & Date	Date	Work Done
MH 16	MH 17	7	1	NW corner, rear of property, 27 Kailua Way	Rear of property, 35 Kailua Way	6"	PVC	233.9	12/08	1	109.5	MH17 - MH16	Crack in the pipe	4	5	TV	2015	
											113.0		Joint gasket exposed		0	TV	2015	
											233.9		Joint offset in pipe		0	TV	2015	
											233.9		Camera unable to get thru		0	TV	2015	
MH 17	CO 8	3	1	Rear of property, 35 Kailua Way	Westernmost corner of property @ 53 Kailua Way	6"	PVC	246.6	12/23/08	1				0	1	TV	2015	
MH 12	MH 18	32	1	Near SW corner of 12 Kailua Way	Front of vacant (?) lot across from 7 Kailua Way	6"	ACP	77.0	10-97,12-09	5	69.7'	18-12	Root in joint	3	8	CUT	FY13	TV in 2014
MH 18	MH 19	32	1	Front of vacant (?) lot across from 7 Kailua Way	Front of 6 Kailua Way	6"	ACP	169.6	10-97,12-09	5	25'-28'	19-18	Pipe type change at lateral	0	5	TV	2014	
MH 19	MH 20	30	1	Front of 6 Kailua Way	Front of 2 Kailua Way	6"	ACP	180.5	10-97,12-090	5	95'-98'	20-19	Pipe type change at lateral	0	5	TV	2014	
MH 20	MH 21	28	1	Front of 2 Kailua Way	SW corner, front of 298 Oceana Drive	6"	ACP	130.1	10-97,12-09	5			None to report	0	5	TV	2014	
MH 21	MH 22	24	1	SW corner, front of 298 Oceana Drive	SW corner, near lot line between 320 & 330 Oceana Drive	6"	ACP	215.1	12-09	5	158.5	22-21	Root in Joint	2	7	TV	2014	Cut at next inspection
MH 21	CO 4	2	1	SW corner, front of 298 Oceana Drive	SW end of 310 Oceana Drive, close to #298					15				0	15	TV	2013	
MH 21	CO 5	2	1	SW corner, front of 298 Oceana Drive	At 220 Oceana Drive, approx. 40' from street	6"	ACP	214.8	10-97,12-09	5	58.4	21-CO5	Root in joint	2	7	TV	2014	Cut at next inspection
MH 22	MH 23	8	1	SW corner, near lot line between 320 & 330 Oceana Drive	NW corner, rear of property, 320 Oceana Drive	6"	ACP	96.5	06-07	2	2.0	MH23 - MH22	Root in joint	4	6	CUT	FY13	
											19.7		Root in joint		0	CUT	FY13	
MH 22	MH 27	17	1	SW corner, near lot line between 320 & 330 Oceana Drive	NW corner, rear of property, 360 Oceana Drive				06-07	2				0	2	TV	2014	
MH 23	MH 24	7	1	SW corner, rear of property, 320 Oceana Drive	Front of 325 Oceana Drive	6"	ACP	166.0	06-07	0	30.6	MH24 - MH23	Joint separated in the pipe	11	11	`	2019	(Potential reline)
			1							0	99.9		Joint separated in the pipe	11	11	TV	2019	(Potential reline)
			1							0	113.4		Joint separated in the pipe	11	11	TV	2019	(Potential reline)
			1							0	126.4		Joint separated in the pipe	11	11	TV	2019	(Potential reline)
			1							0	133.6		Root in joint	11	11	TV	2019	Cut 6-13
			1							0	138.8		~~Pipe collapsed; can't get camera through; joint separated in pipe~~	11	11	TV	2019	Repaired offset 10/07
			1							0	2.0	MH23 - MH24	Root in joint	11	11	TV	2019	Cut 6-13
			1							0	28.1		~~Joint separated; can't get through~~	11	11	TV	2019	(see repair for 138.8, above)
			1						13-14	0	34		Grease in sag	1	1	TV	2019	Roots cut & Grease washed out 6-14 (Potential reline)
MH 24	MH 25	6	1	Front of 325 Oceana Drive	Front of 350 Oceana Drive	6"	ACP	231.1	06-07	0	88.0	MH25 - MH24	Joint separated in the pipe	3	3	TV	2019	
			1								185.0		Joint separated in the pipe		0	TV	2019	
			1								223.0		Joint separated in the pipe		0	TV	2019	
			1						13-14	0		MH25 - MH24	Root in joint	2	2	TV	2019	Roots cut 6-14 (Potential reline)
			1						13-14	0			Root in joint	2	2	TV	2019	Roots cut 6-14 (Potential reline)
			1						13-14	0			Root in joint	2	2	TV	2019	Roots cut 6-14 (Potential reline)
			1						13-14	0		MH25 - MH24	Root in joint	2	2	TV	2019	Roots cut 6-14 (Potential reline)
			1						13-14	0			Root in joint	2	2	TV	2019	Roots cut 6-14 (Potential reline)
			1						13-14	0			Root in joint	2	2	TV	2019	Roots cut 6-14 (Potential reline)
			1						13-14	0			Root in joint	2	2	TV	2019	Roots cut 6-14 (Potential reline)

OCEANA MARIN SEWER SYSTEM (Pipe Segments)

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PIPE SEGMENT				PHYSICAL LOCATION						PROBLEMS?							REPAIRS?	
FROM	TO	# of Upstream Services	Service rating	FROM	TO	PIPE SIZE	TYPE OF PIPE	LENGTH OF SECTION (in feet)	YEAR(s) T.V.'d	Date rating	Distance (in feet)	Direction (From MH/CO to MH/CO)	Problem Found	Wt. of Problem	Priority	Recommended Action & Date	Date	Work Done
			1						13-14	0		MH25 - MH24	Root in joint	2	2	TV	2019	Roots cut 6-14 (Potential reline)
			1						13-14	0			Root in joint	2	`	TV	2019	Roots cut 6-14 (Potential reline)
MH 25	MH 26	4	1	Front of 350 Oceana Drive	Front of 365 Oceana Drive	6"	ACP	160.3	06-07	0	132.5	MH26 - MH25	Joint separated	1	1	TV	2019	None
									13-14	0	26.1	MH26 - MH25	Roots in joint	2	0	TV	2019	Roots cut 6-14 (Potential reline)
									13-14	0	39.0	MH26 - MH25	Roots in joint	2	0	TV	2019	Roots cut 6-14 (Potential reline)
									13-14	0	52.3	MH26 - MH25	Roots in joint	2	0	TV	2019	Roots cut 6-14 (Potential reline)
									13-14	0	65.2	MH26 - MH25	Roots in joint	2	0	TV	2019	Roots cut 6-14 (Potential reline)
									13-14	0	91.7	MH26 - MH25	Roots in joint	2	0	TV	2019	Roots cut 6-14 (Potential reline)
											104.8	MH26 - MH25	Roots in joint	2	0	TV	2019	Roots cut 6-14 (Potential reline)
											144.4	MH26 - MH25	Roots in joint	2	0	TV	2019	Roots cut 6-14 (Potential reline)
									13-14	0	156.7	MH26 - MH25	Joint offset med	1	0	TV	2019	None
MH 26	CO 6	3	1	Front of 365 Oceana Drive	In street in front of 416 Oceana Drive	6"	ACP	447.9	06-07	8	9.1	MH26 - CO6	Joint separated	1	9	TV	2019	
			1							8	22.4			1	9	TV	2019	
			1							8	443.9			1	9	TV	2019	
			1							8	446.4			1	9	TV	2019	
			1						13-14	8	60.0	MH26 - CO6	Camera unable to get up hill	1	9	TV	2019	
MH 27	MH 28	15	1	NW corner, rear of property, 360 Oceana Drive	Rear of property, 360 Oceana Drive, approx. 75' E of MH #27	6"	ACP	89.6	06-07	2	84.5		Joint separated	1	3	TV	2019	
MH 28	MH 29	14	1	Rear of property, 360 Oceana Drive, approx. 75' est of MH #27	On lot line, between 360 & 370 Oceana Drive, near rear of properties	6"	ACP	129.4	06-07	2	99.7		Root in joint	2	4	CUT	FY13	
											129.4		~~Joint offset; root in joint. Camera not able to get through~~	4	0	TV	2014	Offset repaired
MH 28	MH 30			Rear of property, 360 Oceana Drive, approx. 75' est of MH #27	On lot line, between 370 and 380 Oceana Drive, rear of properties	6"	ACP	361	Inspection by Dan Garrett and Jeff Corda 2/28/2014				Even though MH29 is in this group, and the main culprit, I believe there is more intrusion in this area. It cannot be seen from a parrticular manhole, but I do vbelieve that this area should be tv'd in our nextg TW sewer line inspection sequence.					
MH 29	MH 30	14	1	On lot line, between 360 & 370 Oceana Drive, near rear of properties	On lot line, between 370 and 380 Oceana Drive, rear of properties	6"	ACP	231.2	06-07	2	12.3	MH30 - MH29	Joint separated	4	6	TV	2014	
											54.0		Sag		0	TV	2014	
											99.3		Sag		0	TV	2014	
											168.1		Sag		0	TV	2014	

OCEANA MARIN SEWER SYSTEM (Pipe Segments)

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PIPE SEGMENT				PHYSICAL LOCATION						PROBLEMS?							REPAIRS?	
FROM	TO	# of Upstream Services	Service rating	FROM	TO	PIPE SIZE	TYPE OF PIPE	LENGTH OF SECTION (in feet)	YEAR(s) T.V.'d	Date rating	Distance (in feet)	Direction (From MH/CO to MH/CO)	Problem Found	Wt. of Problem	Priority	Recommended Action & Date	Date	Work Done
MH 30	MH 31	13	1	On lot line, between 370 & 380 Oceana Drive, rear of properties	SE corner, rear of property, 410 Oceana Drive	6"	ACP	340.7	06-07	2	6.3	MH31 - MH30	Root in joint	14	16	CUT	FY13	
											33.2		Joint separated		0	TV	2014	
											47.1		Joint separated		0	TV	2014	
											85.9		Lateral separated		0	TV	2014	
											106.5		Root in joint		0	CUT	FY13	
											153.8		Joint separated		0	TV	2014	
											180.5		~~Lateral separated~~		0	TV	2014	Offset repaired
											204.8		Root in joint		0	CUT	FY13	
											211.0		Root in joint		0	CUT	FY13	
											310.6		Joint separated		0	TV	2014	
MH 31	MH 32	10	1	At rear of property of 410 Oceana Drive, near lot line of #400	Rear of "Parcel G", between 410 & 416 Oceana Drive	6"	ACP	84.7	06-07	2	180.5	MH32 - MH31	~~Lateral separation~~	1	3	TV	2014	Repaired 10/09
MH 32	MH 33	9	1	At rear of Parcel "G"	SE corner, rear of property, 424 Oceana Drive	6"	ACP	238.0	06-07	2	78.9	MH33 - MH32	Root in joint	2	4	CUT	FY13	
											121.6		Lateral separation; crack	5	0	TV	2014	
MH 33	MH 104	4	1							15				0	15	TV	2014	
MH 33	CO 16	2	1	At rear of property of 424 Oceana Drive, near lot line of #420	Rear of property @ 432 Oceana Drive				06-07	2				0	2	TV	2014	
MH 34	MH 35	98	3	In front of 12 Kailua Way	In front of 16 Kailua Way	6"	ACP	148.8	2-2012	1			None to report	0	1	TV	2019	
MH 35	MH 36	96	3	In front of 16 Kailua Way	In front of 24 Kailua Way (near lot line of 22 Kailua Way)	6"	ACP	200.6	2-2012	1	8.9	MH36 - MH35	Joint separated in the pipe	3	10	TV	2019	
			3							1	30.3		Sag in the pipe	2	7	TV	2019	
			3							1	96.9		Sag in the pipe	2	7	TV	2019	
MH 36	MH 37	94	3	In front of 24 Kailua Way (near lot line of 22 Kailua Way)	In front of 28 Kailua Way (near "vacant" lot)	6"	ACP	135.1	2-2012	1	114.2	MH37 - MH36	Joint separated in the pipe	3	10	TV	2019	
MH 37	MH 38	93	3	In front of 28 Kailua Way (near "vacant" lot)	Between 28 & 30 Kailua Way	10"	ACP	70.0	10-97,12-09	3			None to report	0	3	TV	Dec-16	
MH 38	MH 39	92	3	Between 28 & 30 Kailua Way	In front of 38 Kailua Way (before street swings to the R)	10"	ACP	304.3	10-97,12-09	3			None to report	0	3	TV	Dec-16	
MH 39	MH 40	88	3	In front of 38 Kailua Way (before street swings to the R)	SW side of 45 Kailua Way, along lot line between 45 & 41, approx. 40' from street	10"	ACP	182.9	10-97,12-09	3			None to report	0	3	TV	Dec-16	
MH 39	CO 18	1	1	In front of 38 Kailua Way (before street swings to the R)	On property @ 38 Kailua Way, approx. 75' from MH #39					15				0	15	TV	2013	
MH 40	MH 41	88	3	SW side of 45 Kailua Way, along lot line between 45 & 41, approx. 40' from street	NW side of 45 Kailua Way, near rear of property, approx. 40' N of #40	10"	ACP	55.5	10-97, 12-09	3			None to report	0	3	TV	Dec-16	
MH 41	MH 42	87	3	NW side of Kailua Way, near rear of property, approx. 40' N of #40	In front of 48 Kailua Way	10"	ACP	123.2	10-97, 12-09	3			None to report	0	3	TV	Dec-16	
MH 42	MH 43	85	3	In front of 48 Kailua Way	In front of 49 Kailua Way	8"	ACP	52.0	10-97, 12-09	3			None to report	0	3	TV	Dec-16	
MH 42	CO 17	1	1	In front of 48 Kailua Way	Near front of property @ 44 Kailua Way				6/00	12				0	12	TV	2013	
MH 43	MH 52	63	2	In front of 49 Kailua Way	In front of 56 Kailua Way	8"	ACP	214.7	10-97,12-09	3			None to report	0	3	TV	Dec-16	
MH 43	MH 44	22	1	In front of 49 Kailua Way	Middle of property @ 48 Kailua Way, approx. 125' from street	6"	DIP	148.9	06-00, 02-08	1				0	1	CIP	2013	Repair with liner FY13
MH 44	MH 45	21	1	Middle of property @ 48 Kailua Way, approx. 125' from street	NW side of Parcel "A", approx. 300' from rear of "vacant" lot between 53 & 54 Kona Lane	6"	DIP	384.5	06-00, 02-08	1	309.5	MH45 - MH44	Joint pulled apart; MH 45 needs replacement	5	6	CIP	2013	Repair with liner FY13
MH 45	MH 46	21	1	NW side of Parcel "A", approx. 300' from rear of "vacant" lot between 53 & 54 Kona Lane	Behind 54 Kona Lane, approx. 30' front lot line	6"	DIP	330.0	06-00, 02-08	1	309.5	MH46 - MH45	Root in joint (RSS indicates that MH #45 needs to be replaced)	7	8	CIP	2013	10' section replaced 20 above MH45 with PVC. Repair with liner FY13
MH 46	MH 47	19	1	Behind 54 Kona Lane, approx. 30' front lot line	Rear of 50 Kona Lane, NE corner, adjacent to lot line of #46	6"	DIP	109.2	1-2012	1			None to report	0	1	CIP	2013	Repair with liner FY13

OCEANA MARIN SEWER SYSTEM (Pipe Segments)

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PIPE SEGMENT				PHYSICAL LOCATION						PROBLEMS?							REPAIRS?	
FROM	TO	# of Upstream Services	Service rating	FROM	TO	PIPE SIZE	TYPE OF PIPE	LENGTH OF SECTION (in feet)	YEAR(s) T.V.'d	Date rating	Distance (in feet)	Direction (From MH/CO to MH/CO)	Problem Found	Wt. of Problem	Priority	Recommended Action & Date	Date	Work Done
MH 46	CO 7	2	1	Behind 54 Kona Lane, approx. 30' front lot line	At rear of property @ 53 Kona Lane, on lot line	6"	ACP	236.5	06-00	9	6.5	MH46 - CO7	Lateral & roots		13	CUT	FY 13	
											183.0		Unable to push camera any more	4	0	TV	2013	
											73.5	CO7 - MH46	Lateral - overlapped line		0	TV	2013	
MH 47	MH 48	18	1	Rear of 50 Kona Lane, NE corner, adjacent to lot line of #46	Rear of 42 Kona Lane, approx. 30' W of lot line of #38	6"	ACP	212.1	1-2012	1			None to report	0	1	TV	2019	
MH 48	MH 49	16	1	Rear of 42 Kona Lane, approx. 30' W of lot line of #38	Rear of 26 Kona Lane, adjacent to lot line of #30	6"	ACP	168.6	1-2012	1			None to report	0	1	TV	2019	
MH 49	MH 50	10	1	Rear of 26 Kona Lane, adjacent to lot line @ #30	Middle of street between 26 & 27 Kona Lane	6"	ACP	134.7	1-2012	1	131.8	MH50 - MH49	Root problem in joint	3	4	Cut	2013	
MH 49	CO 14	2	1	Rear of 26 Kona Lane, adjacent to lot line @ #30	Rear of property @ 14 Kona Lane	3"	ABS	112.7	1-2012	1			None to report	0	1	TV	2019	
MH 50	MH 51	10	1	Middle of street between 26 & 27 Kona Lane	In front of 511 Oceana Drive, near entrance to Kona Lane	6"	ACP	434.8	1-2012	1	17.4	MH51 - MH50	Crack in the pipe	4	5	Patch	2013	
			1							1	353.4		Joint Offset in the Pipe	4	5	TV	2019	
MH 52	MH 53	54	2	In front of 56 Kailua Way	On lot line between 56 & 60 Kailua Way, approx. 175' from street	8"	ACP	186.0	06-00	9	16.0	MH53 - MH52	~~Pipe blocked by roots~~	2	13	CIP	2013	Repair with liner FY13
											18.7		Fish mouth rubber		0	CIP	2013	Repair with liner FY13
											87.6		Offset joint		0	CIP	2013	Repair with liner FY13
MH 52	CO 15	3	1	In front of 56 Kailua Way	End of cul-de-sac on Kailua Way, in front of #65	6"	ACP	105.3	12-09	3			None to report	0	3	TV	Dec-16	
MH 53	MH 54	53	2	On lot line between 56 & 60 Kailua Way, approx. 175' from street	On lot line between 56 & 60 Kailua Way, just past rear lot line	8"	ACP	131.0	06-00,12-09	3			None to report	0	3	CIP	2013	Repair with liner FY13
MH 54	MH 55	37	1	On lot line between 56 & 60 Kailua Way, just past rear lot line	Small NW section of Parcel "A", just past center of rear lot line of 30 Waikiki Lane	6"	ACP	305.0	06-00, 12-09	3	49.2	55-54	crack in line	3	6	TV	Dec-16	Repair at next inspection
									06-00,12-09	3	279.1	55-54	crack in line	3	6	TV	Dec-16	Repair at next inspection
									06-00,12-09	3	302.4	55-54	Small separation	3	6	TV	Dec-16	Repair at next inspection
MH 55	MH 56	34	1	Small NW section of Parcel "A", just past center of rear lot line of 30 Waikiki Lane	Approx. 75' behind rear lot line of 26 Waikiki Lane	6"	ACP	200.5	06-00, 12-09	3	164.0	55-56	Small Seperation	3	6	TV	Dec-16	Repair at next inspection
MH 56	MH 57	34	1	Approx. 75' behind rear lot line of 26 Waikiki Lane	On lot line at rear of properties @ 18 & 22 Waikiki Lane	6"	ACP	239.6	06-00, 12-09	3	118.6	MH57-MH56	root in joint	5	8	TV	Dec-16	Cut and repair at next inspection
MH 57	MH 58	7	1	On lot line at rear of properties @ 18 & 22 Waikiki Lane	Rear of property @ 6 Waikiki Lane	6"	ACP	263.2	06-00, 12-09	3	943.2	MH58 - MH57	Top of pipe damaged; roots growing through joint	5	8	TV	Dec-16	Cut and repair at next inspection
											181.7	MH58 - MH57	Top of pipe damaged; roots growing through joint	5	8	TV	Dec-16	Cut and repair at next inspection
											260.5	MH58 - MH57	root in joint	5	8	TV	Dec-16	Cut and repair at next inspection
MH 57	MH 59	26	1	On line at rear of properties @ 18 & 22 Waikiki Lane	Approx. 85' behind 10 Waikiki Lane, on Parcel "N"	6"	ACP	213.0	06-00,12-09	3			None to report	0	3	TV	Dec-16	
MH 57	CO 27								Inspection by Dan Garrett and Jeff Corda 2/28/2014				There seems to be a good amount of intrusion coming uphill of MH 57 and needs to be tv'd in our next TV inspection sequence. If I remember correctly, this was inspected a couple of years ago, and it had root penetration, but I cannot remember if they ever were cleaned out.					
MH 58	CO 9	3	1	Rear of property @ 6 Waikiki Lane	Rear of property @ 581 Oceana Drive, near lot line for #577	6"	ACP	107.0	06-00,12-09	3	8.2	MH58 - CO9	Pipe separation at 3', Sag 3-10', joint separation 46', Roots in joint	2	5	TV	Dec-16	Cut and repair at next inspection
MH 58	CO 27	3	1	Rear of property @ 581 Oceana Drive, near lot line for #577	Rear of property @ 577 Oceana Drive, near lot line for #573	6"	ACP	62.7	12-09	3	41'	MH58-CO27	Roots at 41'	3	6	TV	Dec-16	Cut at next inspection
MH 59	MH 60	26	1	Approx. 85' behind 10 Waikiki Lane, on Parcel "N"	Near front of Parcel "M", between 585 & 591 Oceana Drive	6"	ACP	365.0	06-00,12-09	3	234.6	MH60 - MH59	Lateral - appears to be infiltrating, roots	5	8	TV	Dec-16	Notice to Resident
MH 60	MH 61	25	1	Near front of Parcel "M", between 585 & 591 Oceana Drive	In front of 584 Oceana Drive	6"	ACP	75.3	06-00,12-09	3			None to report	0	3	TV	Dec-16	

OCEANA MARIN SEWER SYSTEM (Pipe Segments)

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PIPE SEGMENT				PHYSICAL LOCATION						PROBLEMS?						REPAIRS?	
FROM	TO	# of Upstream Services	Service rating	FROM	TO	PIPE SIZE	TYPE OF PIPE	LENGTH OF SECTION (in feet)	YEAR(s) T.V.'d	Date rating	Distance (in feet)	Direction (From MH/CO to MH/CO)	Problem Found	Wt. of Problem	Priority	Recommended Action & Date	Date	Work Done
MH 61	MH 62	2	1	In front of 584 Oceana Drive	Intersection of Oceana Drive & Lelani Lane	6"	ACP	175.8	12-09	3			None to report	0	3	TV	Dec-16	
MH 61	MH 63	22	1	In front of 584 Oceana Drive	In front of 568 Oceana Drive	6"	ACP	312.4	12-09	3			None to report	0	3	TV	Dec-16	
MH 62	CO 30	1	1	Intersection of Oceana Drive & Lelani Lane	Front of property @ 588 Oceana Drive, near lot line for #584	6"	ACP	158.8	12-09	3			None to report	0	3	TV	Dec-16	
MH 63	MH 64	18	1	In front of 568 Oceana Drive	In front of 556 Oceana Drive	6"	ACP	354.5	12-09	3	241.6	64-63	Grease	1	4	TV	Dec-16	
MH 64	MH 65	14	1	In front of 556 Oceana Drive	In front of 541 Oceana Drive	6"	ACP	407.2	12-09	3			None to report	0	3	TV	Dec-16	
MH 64	CO 26	1	1	In front of 556 Oceana Drive	Near front of property @ 560 Oceana Drive					3				0	3	TV	Dec-16	
MH 65	MH 66	8	1	In front of 541 Oceana Drive	In front of 511 Oceana Drive	6"	ACP	404.8	12-09	3			None to report	0	3	TV	Dec-16	
MH 65	CO 22	1	1	In front of 541 Oceana Drive	Near front of property @ 536 Oceana Drive					3				0	3	TV	Dec-16	
MH 66	CO 10	3	1	In front of 511 Oceana Drive	In street between 504 & 508 Oceana Drive	6"	ACP	247.2	12-09	3	200.0	MH66-CO10	Some dirt, offset	2	5	TV	Dec-16	
MH 54	MH 67	16	1	On lot line between 56 & 60 Kailua Way, approx. 175' from street	Located at rear of property @ 27 Waikiki Lane	6"	122' ACP, 150' DIP	272.6	06-00	9	84.8	MH67 - MH54	42° pushing through joint	1	10	CIP	2013	Repair with liner FY13
MH 67	MH 68	15	1	Located at rear of property @ 27 Waikiki Lane	Rear of property @ 19 Waikiki Lane (adjacent to lot line for #23)	6"	DIP	174.0	06-00	9				0	9	CIP	2013	Repair with liner FY13
MH 68	MH 69	14	1	Rear of property @ 19 Waikiki Lane (adjacent to lot line for #23)	Rear of property @ 11 Waikiki Lane (adjacent to lone line for #15)	6"	DIP	189.6	06-00	9	187.6	MH69 - MH68	~~Cement in line~~	0	9	TV	2013	Roys SS removed
MH 69	MH 70	11	1	Rear of property @ 11 Waikiki Lane (adjacent to lot line for #15)	Rear of property @ 565 Oceana Drive (SE corner, adjacent to lot line for #563)	6"	DIP	216.3	06-00	9	214.9	MH70 - MH69	Infiltration just before manhole	2	11	TV	2013	
MH 69	CO 29	1	1	Rear of property @ 11 Waikiki Lane (adjacent to lot line for #15)	Near rear of property @ 11 Waikiki Lane, approx. 40' N of MN #69									0	0	TV	2013	
MH 70	MH 71	9	1	Rear of property @ 565 Oceana Drive (SE corner, adjacent to lot line for #563)	At rear of property, on lot line between 561 & 563 Oceana Drive	6"	ACP	90.0	06-00	9	3.0	MH71 - MH70	3 ft. in offset joint	2	11	TV	2019	
											89.4		Infiltration @ joint		0	TV	2019	
									1-2012	1				0	1	TV	2019	
MH 70	CO 28	2	1	Rear of property @ 565 Oceana Drive (SE corner, adjacent to lot line for #563)	Near rear of property @ 7 Waikiki Lane					15				0	15	TV	2013	
MH 71	MH 72	7	1	At rear of property, on lot line between 561 & 563 Oceana Drive	SE corner @ rear of property at 553 Oceana Drive	6"	ACP	278.2	1-2012	1	8.5	MH72 - MH71	Infiltration in the pipe	2	3	Repair	FY13	
										1	82.5		Joint offset in the pipe	3	1	Repair	FY13	
										1	146.1		Joint offset in the pipe	3	1	Repair	FY13	
										1	166.1		Joint Offset in the Pipe	5	1	Repair	FY13	
										1	274.5		Infiltration in the pipe	2	1	Repair	FY13	
MH 71	CO 25	1	1	At rear of property, on lot line between 561 & 563 Oceana Drive	Near front of property @ 561 Oceana Drive					15				0	15	TV	2013	
MH 72	MH 73	4	1	SE corner @ rear of property at 553 Oceana Drive	At rear of property, on lot line between 541 & 545 Oceana Drive	6"	ACP	168.8	1-2012	1			None to report	0	1	TV	2019	
MH 72	CO 24	1	1	SE corner @ rear of property at 553 Oceana Drive	On property @ 553 Oceana Drive, approx. 40' from street					15				0	15	TV	2013	
MH 73	CO 11	1	1	At rear of property, on lot line between 541 & 545 Oceana Drive	Rear of property @ 537 Oceana Drive, near lot line of #541	4"	ACP	76.9	1-2012	1			None to report	0	1	TV	2019	
MH 73	CO 21	1	1	At rear of property, on lot line between 541 & 545 Oceana Drive	Middle of property @ 541 Oceana Drive, near lot line for #537	4"	ACP	38.2	1-2012	1			None to report	0	1	TV	2019	
MH 74	MH 75	71	2	Northern end of "vacant" lot between 6 @ 12 Kailua Way	In Parcel "A", approx. 150' NE of MH #74	6"	DIP	146.0	12-08	1	127.8	MH75 - MH74	~~Root problem in joint~~	0	1	CIP	2013	Repair with liner FY13
									12-08		24.4	MH76 - MH75	~~Joint Offset~~		1	CIP	2013	Repair with liner FY13
											125.9		~~Root problem in joint~~		0	CIP	2013	Repair with liner FY13
											136.5		~~Root problem in joint; camera unable to get thru~~		0	CIP	2013	Repair with liner FY13

OCEANA MARIN SEWER SYSTEM (Pipe Segments)

C:\Users\Barbara\Desktop\[Book2.xlsx]Pipe Segments 14

PIPE SEGMENT				PHYSICAL LOCATION						PROBLEMS?							REPAIRS?	
FROM	TO	# of Upstream Services	Service rating	FROM	TO	PIPE SIZE	TYPE OF PIPE	LENGTH OF SECTION (in feet)	YEAR(s) T.V.'d	Date rating	Distance (in feet)	Direction (From MH/CO to MH/CO)	Problem Found	Wt. of Problem	Priority	Recommended Action & Date	Date	Work Done
MH 75	MH 76	71	2	In Parcel "A", approx. 150' NE of MH #74	SE corner @ rear of property at 11 Kameha Way	6"	DIP100' ACP 357'	400.0		1	44.1	MH75 - MH76	~~Root problem in joint; camera unable to get thru; concrete in the bottom~~	0	0	CIP	2013	Repair with liner FY13
									1-09		125.7	MH76 - MH75	~~Root problem~~		0	CIP	2013	Repair with liner FY13
											135.8		~~Root problem~~		0	CIP	2013	Repair with liner FY13
											145.7		~~Root problem~~		0	CIP	2013	Repair with liner FY13
											156.0		~~Root problem~~		0	CIP	2013	Repair with liner FY13
											166.9		~~Root problem~~		0	CIP	2013	Repair with liner FY13
											177.4		~~Root problem~~		0	CIP	2013	Repair with liner FY13
											227.0		~~Repair area~~		0	CIP	2013	Repair with liner FY13
											231.7		~~Can't get thru~~		0	CIP	2013	Repair with liner FY13
MH 75	CO 35	71	2	In Parcel "A", approx. 150' NE of MH #74	In Parcel "A", approx. 217 NE from MH 75	6"	~~DIP 10~~ 0' ACP 117'	217'	1-09	3			Installed Clean out 35	1	5	CIP	2013	
CO 35	MH 76	71	2	In Parcel "A", approx. 217 NE from MH 75	SE corner @ rear of property at 11 Kameha Way	6"	ACP	240'	1-09	3			Installed Clean out 35	1	5	CIP	2013	
MH 76	MH 77	17	1	SE corner @ rear of property at 11 Kameha Way	At rear of property @ 19 Kameha Way, near lot line for #15	6"	ACP	234.1	06-00	9	221.3	MH77 - MH76	Lateral is broken behind the Y	1	10	Patch	FY13	
			1						2-2012	1	198.7		Crack in the pipe	2	3	Patch	FY13	
			1						2-2012	1	203.9		Joint offset in the pipe	3	4	TV	2019	
MH 76	MH 85	54	2	SE corner @ rear of property at 11 Kameha Way	In front of 11 Kameha Way, near Parcel "A"	6"	DIP	135.6	06-00,12-08	4			None to report	0	4	CIP	2013	Repair with liner FY13
MH 77	MH 78	14	1	At rear of property @ 19 Kameha Way, near lot line for #15	Rear of property @ 23 Kameha Way, near lot line for #19	6"	ACP	114.7	2-2012	1	105.4	MH78 - MH77	Joint separated in the pipe	3	4	TV	2019	
MH 78	MH 79	13	1	Rear of property @ 23 Kameha Way, near lot line for #19	At rear of property @ 35 Kameha Way, center of lot line	6"	ACP	258.9	1-2012	1	2.2	MH79 - MH78	Root in joint	3	4	Cut	FY 13	
										1	30.3		Joint offset in the pipe	3	1	TV	2019	
										1	178.6		Joint offset in the pipe	3	1	TV	2019	
										1	254.8		Infiltration in the pipe	2	1	Patch	FY 13	
MH 79	MH 80	10	1	At rear of property @ 35 Kameha Way, center of lot line	On lot line at rear of properties @ 43 & 45 Kameha Way	6"	ACP	208.1	06-00	9	82.4	MH79 - MH80	Offset joint	1	10	TV	2019	
			1						1-2012	1	82.3	MH80 - MH79	Joint offset in the pipe	5	6	TV	2019	
MH 80	MH 81	8	1	On lot line at rear of properites @ 43 & 45 Kameha Way	In Parcel "A", approx. 40' beyond rear lot line of #48 Kameha Way	6"	ACP	181.3	1-2012	1			None to report	0	1	TV	2019	
MH 81	MH 82	6	1	In Parcel "A", approx. 40' beyond rear lot line of #48 Kameha Way	In Parcel "A", approx. 40' N of MH #80	6"	ACP	65.2	1-2012	1			None to report	0	1	TV	2019	
MH 82	MH 83	6	1	In Parcel "A", approx. 40' N of MH #80	At rear of property @ 43 Kona Lane	6"	ACP	57.2	1-2012	1	57.2	MH83 - MH82	Infiltration in the pipe	2	3	Patch	FY 13	
MH 83	MH 84	4	1	At rear of property @ 43 Kona Lane	At rear of property at 31 Kona Lane, adjacent to lot line for #35	6"	ACP	270.2	06-00	9	67.5	MH84 - MH83	Lateral @ 2:00 offset behind the Y w/roots in joint	3	12	Cut	FY 13	
			1						1-2012	1	69.9		Root problem in lateral	3	4	Cut	FY 13	
MH 85	MH 86	27	1	In front of 11 Kameha Way, near Parcel "A"	In front of 18 Kameha Way	6"	ACP	171.7	1-2012	1			None to report	0	1	TV	2019	
MH 85	MH 93	27	1	In front of 11 Kameha Way, near Parcel "A"	In front of 6 Kameha Way	6"	ACP	92.0	1-2012	1	0.2	MH93 - MH85	Roots in the pipe	3	4	Cut	FY 13	
			1							1	23.6		Joint Offset in the Pipe	3	4	TV	2019	
MH 86	MH 87	25	1	In front of 18 Kameha Way	In front of 42 Kameha Way	6"	ACP	482.0	1-2012	1			None to report	0	1	TV	2019	
MH 87	MH 88	19	2	In front of 42 Kameha Way	At rear of property @ 42 Kameha Way, near lot line for #38	6"	ACP	142.6	1-2012	1			None to report	0	1	TV	2019	
MH 87	CO 12	1	1	In front of 42 Kameha Way	End of cul-de-sac on Kameha Way, in front of #48					15				0	15	TV	2019	
MH 88	MH 89	18	2	At rear of property @ 42 Kameha Way, near lot line for #38	At rear of properties on lot line between #31 and #34 Maui Lane	6"	ACP	61.4	1-2012	1	1.5	MH89 - MH88	Roots in the pipe	3	7	Cut	FY 13	

OCEANA MARIN SEWER SYSTEM (Pipe Segments)

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PIPE SEGMENT				PHYSICAL LOCATION						PROBLEMS?						REPAIRS?	
FROM	TO	# of Upstream Services	Service rating	FROM	TO	PIPE SIZE	TYPE OF PIPE	LENGTH OF SECTION (in feet)	YEAR(s) T.V.'d	Date rating	Distance (in feet)	Direction (From MH/CO to MH/CO)	Problem Found	Wt. of Problem	Priority	Recommended Action & Date	Date	Work Done
MH 89	MH 90	5	1	At rear of properties on lot line between #31 and #34 Maui Lane	NW corner of Parcel "J", just behind rear lot line for #27 Maui Lane	6"	ACP	134.9	1-2012	1	124.1	MH89 - MH90	Infiltration in the pipe	2	3	Patch	FY 13	
MH 89	MH 91	11	1	At rear of properties on lot line between #31 and #34 Maui Lane	End of cul-de-sac of Maui Lane	6"	ACP	147.1	1-2012	1			None to report	0	1	TV	2019	
MH 89	CO 13	2	1	At rear of properties on lot line between #31 and #34 Maui Lane	On lot line between 30 & 34 Maui Lane, rear of properties	6"	ACP	117.5	1-2012	1	9.3	MH89 - CO13	Joint offset in the pipe	3	4	TV	2019	
			1							1	114.7		Joint Offset in the Pipe	3	4	TV	2019	
MH 90	CO 35	1	1	NW corner of Parcel "J", just behind rear lot line for #27 Maui Lane	Approx. 60' SW of MH90	4"	ACP	59.9	1-2012	1	34.5	MH90 - CO35	Sag close to MH	0	1	TV	2019	
MH 90	CO 36	1	1	NW corner of Parcel "J", just behind rear lot line for #27 Maui Lane	Approx. 60' SW of MH90	4"	ACP		1-2012	1	17.8	CO36-MH90	Sag	0	1	TV	2019	
MH 91	MH 92	11	1	End of cul-de-sac of Maui Lane	Near from of Maui Lane, adjacent to #6	6"	ACP	420.7	1-2012	1			None to report	0	1	TV	2019	
MH 91-92	CO 23	1	1		Near front of property @ 15 Maui Lane					15				0	15	TV	2019	
MH 93	MH 94	26	1	In front of 6 Kameha Way	In street between 425 & 427 Oceana Drive	6"	ACP	213.7	1-2012	1			None to report	0	1	TV	2019	
MH 94	MH 95	24	1	In street between 425 & 427 Oceana Drive	In front of 435 Oceana Drive	6"	ACP	230.8	1-2012	1			None to report	0	1	TV	2019	
MH 95	MH 96	20	2	In front of 435 Oceana Drive	In front of 451 Oceana Drive	6"	ACP	280.2	1-2012	1			None to report	0	1	TV	2019	
MH 95	CO 32	1	1	In front of 435 Oceana Drive	On property @ 435 Oceana Drive, approx. 40' W of MH #95					15				0	15	TV	2019	
MH 96	MH 97	13	1	In front of 451 Oceana Drive	In street between 463 & 464 Oceana Drive	6"	ACP	295.4	1-2012	1			None to report	0	1	TV	2019	
MH 97	MH 98	5	1	In street between 463 & 464 Oceana Drive	In street between 484 & 490 Oceana Drive	6"	ACP			15			None to report	0	15	TV	2019	
MH 97	CO 19	2	1	In street between 463 & 464 Oceana Drive	Near front of property @ 468 Oceana Drive					15				0	15	TV	2013	
MH 98	CO 20	4	1	In street between 484 & 490 Oceana Drive	Near front of property @ 468 Oceana Drive	4"	PVC	33.7	1-2012	1			None to report	0	1	TV	2019	
MH 99	MH 100	2	1							15				0	15	TV	2019	
MH 100	MH 101	3	1							15				0	15	TV	2019	
MH 101	MH 102	4	1							15				0	15	TV	2019	
MH 102	MH 103	4	1							15				0	15	TV	2019	
CO 19	CO 31	1	1	Near front of property @ 468 Oceana Drive	Near front of property @ 472 Oceana Drive					15				0	15	TV	2013	
MH 104	CO 34	12	1	@ Lift Station on Ocean View Drive (inside manhole)	Approx. 225' SE of MH 104	6"	PVC	341.8	1-2012	1	59.7	MH104 - CO 34	Joint separated in the pipe	3	4	TV	2019	

APPENDIX D

OCEANA MARIN INTRUSION INSPECTION REPORT
Work Done on February 28, 2014

Oceana Marin Intrusion Inspection Report

Work done on February 28th 2014
Work Done By Dan Garrett and Jeff Corda
Report Done By: Jeff Corda

The purpose of the investigation it the intrusion areas of rain water at Oceana Marin was to try and unearth the reasons for high flows within the sewer system during a rain event and locate the major areas on intrusion. Having been on scene during previous rain events and during our last few rounds of TVing, I have come to the realization that there are miniscule intrusion areas throughout the system. On the 28th of February Dan and I went out and tried to find the areas that contributed the largest amount of water into the system, this is what we found.

MH 59- This manhole had been injected with foam by Christian Brothers recently. The walls of the manhole look fine, the intrusion is coming from where the wall meets the floor. The water is coming in from everywhere, I am not sure if the foam injection will work in this area. We might have to try and grind out the base and mortar around the entire area.

MH 23- It looks like there is a significant amount of intrusion coming in from the consumers lateral. The flow looked clean and did not have any bubbles so it is not a washing machine or bath tub. It is my recommendation that we TV the consumers lateral to know for certain if there is a problem. It is relatively easy access to the lateral considering it daylights directly into the manhole.

MH 90- There is a lot of intrusion within this manhole, from the base all the way up the walls. Christian brothers will probably work on the walls but it might end up like MH 59 in regards to the base. Also if I remember correctly a couple years ago we tv'ed this line and there was a leak in the top of the sewer pipe leaving mh 90 and going to mh 89. I believe it was within 10ft of mh 90.

MH 65- Good size leak up high on the wall in this manhole, this one seems like it would be perfect for Christian brothers to do.

MH 29- The intrusion coming into the manhole is entering on top of the pipe coming from the upper manhole 30. The pipe looks to be newer than other pipes in the system. For this leak to be fixed I believe we need to break out the mortar around the pipe and put new mortar in its place.

The next two sets are areas that look to have intrusion other than what can be identified through looking at the manholes in the area.

MH-28 to MH-30

Even though manhole 29 is in this group, and the main culprit, I believe there is more intrusion in this area. It can not be seen from a particular manhole but I do believe that this area should be tv'ed in our next TV sewer line inspection sequence.

MH-57 to CO-27

There seems to be a good amount of intrusion coming uphill of manhole 57 and needs to be tv'ed in our next TV inspection sequence. If I remember correctly this was inspected a couple years ago and it had root penetration but I can not remember if they ever where cleaned out.

In conclusion I believe that the major areas of intrusion that Dan and I located account for around 10GPM. If we can correct these problem areas it should significantly reduce the rate of intrusion within our Oceana Marin sewer system.

APPENDIX E

BEECHER ENGINEERING
Electrical System Assessment Report

North Marin Water District



Oceana Marin Wastewater System

Electrical System Assessment Report

May 2015

Prepared By:

Todd Beecher, P.E.

Beecher Engineering, Inc.

Beecher Engineering, Inc.

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Purpose of Assessment

The purpose of this assessment is as follows:

- Identify aspects of the existing Oceana Marin Pump Station power distribution and control system which require repair or modification based on visual field inspection.

- Identify aspects of the existing North Street Lift Station power distribution and control system which require repair or modification based on visual field inspection.

- Identify aspects of the existing Treatment Ponds power distribution and control system which require repair or modification based on visual field inspection.

- Provide recommendations and associated cost estimates for each of the three (3) sites listed above.

Existing Electrical System Installation Assessment

On April 16, 2015, a site inspection was conducted by Mr. Todd Beecher, P.E. (Beecher Engineering, Inc.), accompanied by personnel from NMWD and Nute Engineering for the purpose of investigating the existing NMWD wastewater system sites. The assessment of each site's power distribution and control system installations was based on visual site inspection and discussions with NMWD personnel.

In general, the following assessment factors are applied to existing, installed electrical systems and comprise the basis for the recommendations included within this report:

- **Equipment Age** – In general, electrical power distribution equipment is typically designed for a maximum service life of approximately 30 years.
- **Visual Condition** – Equipment was inspected for signs of enclosure corrosion, excessive dirt or dust buildup and discoloration on internal components and terminals.
- **Code and Standard Compliance** – Existing equipment and installations were checked for compliance with applicable codes and standards including NFPA 70 (i.e. National Electrical Code) and NFPA 70E (i.e. Standard for Electrical Safety in the Workplace).
- **System Reliability** – A general analysis of existing power system equipment interconnections to assess overall power system reliability.
- **Personnel Safety Concerns** – Based on visual inspection of the existing electrical installations, any concerns related to personnel safety were noted and are included as part of this report.
- **Obsolescence** – Determine if new replacement components and parts are still commercially available for existing power distribution equipment.
- **NMWD Maintenance Staff Input** – Informal interviews with Maintenance Staff were conducted to determine background and historical information for several pieces of equipment and installations and asked to report on reoccurring component and equipment failures.

- **Opportunity for Replacement** – Electrical equipment which is nearing the end of its useful service life but still in good working condition should be considered for replacement if an upcoming improvement project is planned for an area which encompasses the electrical equipment or installation.

Time frames for implementation of the recommendations included in this report are based on the following criteria:

- **Immediate**:
  a. Equipment or current installation conditions present a potential safety hazard to Operations and Maintenance personnel.
  b. Equipment or current installation conditions present a high degree of risk that facility operational reliability may be compromised unless immediate action is taken.
  c. Equipment is well beyond its useful service life and should be planned for immediate replacement.
- **Within Next 5 Years** – This equipment is currently in good working condition but is approaching the end of its useful service life within the next five years. It is recommended that the Owner include replacement of this equipment over the next five year planning time frame.
- **Beyond 5 Years** – This equipment is in good working condition and the useful service life extends beyond the next five years. No recommendations for replacement within the next five years are recommended for this equipment.

Listed below are specific parts of the electrical power system which were inspected:

Oceana Marin Pump Station

The existing pump station is supplied utility power from a pad-mounted PG&E transformer at 240 volts, 3-phase. Standby power is supplied from an 80kW/100kVA, propane gas engine-driven generator (Generac) and automatic transfer switch (ATS). The electrical equipment at the site is housed in three (3) different structures:

- "Doghouse" Shed: PG&E meter, main circuit breaker, ATS, circuit breaker for the main panelboard (installed below-grade) and generator auxiliary power panelboard.

- Above-Grade Block Building: Standby generator.

- Below-Grade Pump Station: Pumps, motor controls, programmable logic controller (PLC) pump station control system, level controls, flowmeter transmitter, grinder local control panel (LCP), ventilation blower controls and main panelboard.



Figure 1: "Doghouse" Shed Interior

The "Doghouse" Shed enclosure is constructed of wood and has not provided adequate protection from the corrosive salt air. Although all of the enclosures within this structure are showing signs of corrosion, the PG&E meter enclosure and main circuit breaker enclosure are the most deteriorated and are both beyond repair. The ATS enclosure, which is fabricated from stainless steel, has some surface corrosion but the enclosure integrity has not been compromised. The small panelboard located in the "Doghouse" Shed includes circuit breakers for powering the standby generator equipment building. This panelboard and the circuit breaker enclosure (i.e. feeder breaker for the main panelboard in the below-grade structure) are starting to show signs of corrosion but the degree of rust appears to be cosmetic at this time.

The above-grade block building that houses the standby generator appears to have provided a good degree of protection for the interior equipment. There is, however, a ventilation louver located along the north wall of the structure which is designed to gravity-close when the ventilation fan is not running (i.e. the ventilation fan is activated when the generator runs). The louver was found to be hung up in the "open" position due to linkage hardware corrosion. Thus, with the louvers stuck in the "open" position, corrosive salt air has been permitted to freely enter the interior of the block building. This is evidenced by surface corrosion on the standby generator enclosure. NMWD personnel reported that the generator enclosure was recently painted due to corrosion that accumulated when the generator was originally installed outdoors. The interior generator and engine equipment appear to be in good

visual condition. NMWD personnel reported that the generator is tested regularly (i.e. once per month) and that no operational or maintenance issues have been reported.



Figure 2: Standby Generator Enclosure Surface Corrosion

The standby generator is fueled by a propane fuel source. During a seismic event, this piping is prone to shearing, particularly at the wall penetration and equipment connection locations.

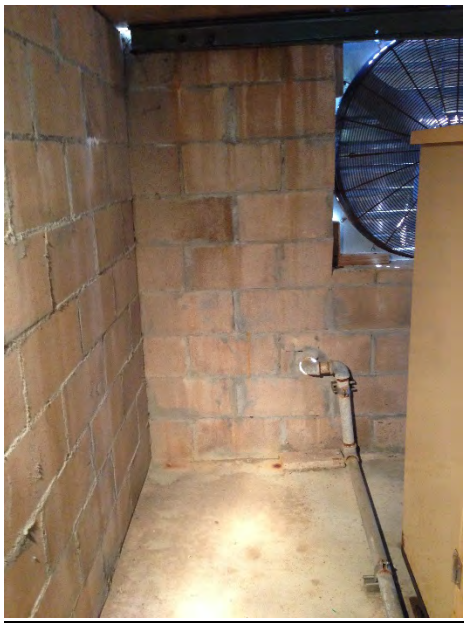


Figure 3: Standby Generator Fuel Piping

The below-grade pump station includes the pump motor control, bubbler level control system and instrumentation equipment. This location is prone to flooding should a piping system failure occur

within the below-grade structure. The existing pump motors are floor-mounted and have totally-enclosed fan-cooled (TEFC) enclosures which are not rated for submersion.

The motor control LCP is wall-mounted within the below-grade structure, appears to be relatively new and is in very good condition. NMWD personnel did not report any operational issues with this equipment. The PLC control panel also appears to be relatively new and in very good condition.

The main panelboard located in the below-grade structure includes circuit breakers for supplying power to the pumping equipment, PLC panel, grinders, structure lighting/receptacles and the structure sump pump. This panelboard is in good condition.

Although the electrical equipment and instrumentation located in the below-grade structure is in good condition and has been well maintained, pump station operability is vulnerable to flooding of this structure. The location of the pump LCP, PLC control panel and non-submersible rated motors within the below-grade structure could render the pump station non-operational if there were to be a piping system failure.

North Street Lift Station

According to NMWD personnel, it is likely that this lift station will be eliminated due to planned modifications for the existing sewage collection system underground piping. Thus, the below-grade lift station was not entered and inspected. NMWD personnel reported that the station level sensor is installed in the below-grade structure. The existing PG&E metering enclosure and level controller were inspected (i.e. this equipment is currently housed in a wood cabinet adjacent to the street). This equipment is in good condition and NMWD did not report any operational issues.



Figure 4: North Street Lift Station Level Controller and PG&E Meter

Treatment Ponds

The motor control equipment at the Treatment Ponds is likely 30+ years of age and is obsolete. Despite this obsolescence condition, however, the equipment has been well maintained. Additionally, the motor controller panel construction is quite simple and future retrofitting of failed components within these existing controller compartments can likely be performed without too much difficulty. NMWD

personnel reported that reliability of the electrical equipment at this site has been very good and no operational issues currently exist.

The PLC panel at this site is essentially new and in very good condition. NMWD personnel stated that this equipment is working well and no operational issues exist at this time.



Figure 5: Treatment Ponds Motor Controller Compartment

Recommendations

Based on the observations noted during the site investigation, the following recommendations have been developed for consideration:

Recommendation No.1: Oceana Marin Pump Station PG&E Meter/Main Replacement:

As noted, the existing PG&E meter and main circuit breaker enclosures have deteriorated beyond repair and require replacement. It is recommended that an outdoor, 316 stainless steel "meter/main" pedestal be installed within the existing "Doghouse" Shed location (e.g. Tesco pedestal). The pedestal equipment is rated for outdoor use. The 316 stainless steel enclosure coupled with installation within the "Doghouse" Shed will provide prolonged service life in the corrosive, salt air environment. This replacement will not require any modification to the existing PG&E service entrance other than engagement of PG&E to disconnect the existing meter and re-connect the new pedestal meter once it is installed.

The estimated installed cost for this replacement is as follows:

- Demolition of Existing Metering Enclosure and Main Breaker Enclosure: $3,000
- 316 Stainless Steel Pedestal Meter/Main Enclosure: $15,000
- PG&E Cost: $3,000

Recommendation No.1 Total Estimated Cost: $21,000

Recommendation No.2: Relocation of Electrical Equipment to Generator Block Building:

As noted in the discussion above, the existing automatic transfer switch and small panelboard located in the "Doghouse" Shed are prone to salt air corrosion due to the type of construction of the shed. Furthermore, the location of the sewage pump LCP, PLC control panel, bubbler panel and main panelboard are all prone to failure due to below-grade structure flooding. During discussions with NMWD, there seemed to be a comfort level that keeping the flowmeter, grinder LCP and blower equipment in the below-grade structure would be acceptable since the operation of this equipment is not as critical to overall pump station operability as the level control system and sewage pumping.

To mitigate these vulnerabilities, it is recommended that the LCP/PLC/bubbler panel/main panelboard equipment be relocated to the above-grade standby generator block building. Although it may be possible to relocate this equipment to locations within the interior of the existing standby generator block building, a better option would be to build an "add on" room, attached to the above-grade block building. This new room could essentially become the "Electrical Equipment Room", constructed with block walls and an industrial type personnel door that provides a good seal from the outside elements. Based on preliminary measurements, existing equipment relocation to the interior of the existing standby generator room may not be possible due to National Electrical Code (NEC) clearance requirements. Additionally, the ventilation system within the generator room will expose the electrical panels to outside salt air on a regular basis (i.e. ventilation fan and louver system). Thus, an "add on" room to the existing building is recommended over using existing wall space within the existing standby generator room.

Also included as part of this recommendation is the replacement of the existing ventilation louver and addition of flexible propane fuel piping connections.

Recommendations regarding the existing pumping equipment are included in the Nute Engineering assessment report.

The estimated installed cost for this recommendation is as follows:

- ATS Relocation (from "Doghouse" to Electrical Room): $25,000
- New "Small Panelboard" (to replace panelboard located in "Doghouse"): $5,000
- Pump LCP Relocation: $15,000
- PLC Control Panel Relocation: $10,000
- Bubbler Panel Relocation: $10,000

- Main Panelboard Relocation: $15,000
- Misc. Electrical Costs: $10,000

Recommendation No.2 Total Estimated Cost: $90,000

*** (Note: Electrical Room addition, louver replacement, and flexible fuel piping connection construction costs are included in Nute Engineering report and are not included in the above estimates)*



Figure 6: Possible "Electrical Room" Location (Generator Building West Wall)

<u>Recommendation No.3: Electrical Power System Studies:</u>

Arc flash hazard warning labels are required by NFPA 70E for power distribution equipment to enhance maintenance personnel safety. In order to develop this labeling, power system software modeling and analysis is required utilizing specialized electrical engineering software (i.e. SKM Systems).

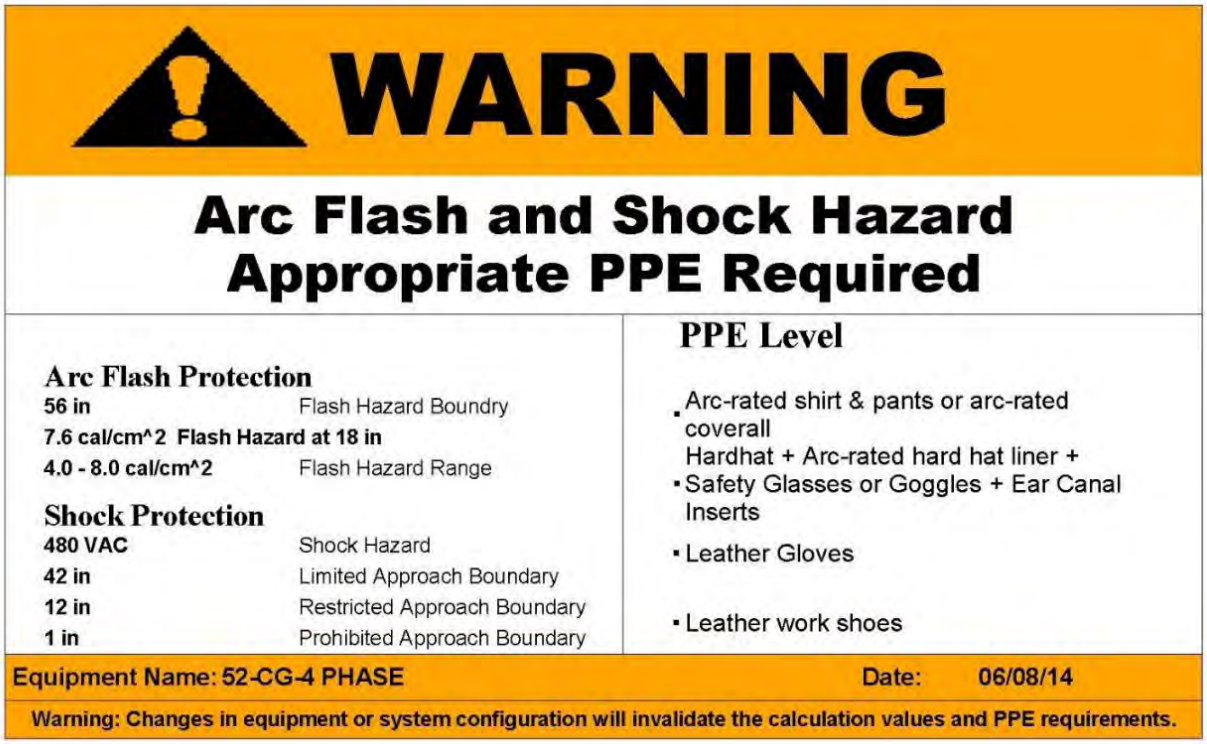


Figure 7: Arc Flash Hazard Warning Label Example

Modeling the existing power distribution systems at the Oceana Marin Pump Station and Treatment Pond sites will involve comprehensive field investigation to determine existing power system equipment ratings, connections, conductor sizes and conductor lengths. Once the systems are modeled within the software, short circuit analyses are performed to determine if the existing, installed equipment is adequately rated to withstand a fault condition at any point in the power system.

After the short circuit analyses are completed, protective device coordination studies and arc flash hazard studies will be performed simultaneously to optimize system protection while minimizing arc flash hazard at all points in each system.

Arc flash hazard warning labels are a code requirement. It is recommended that the District initiate the development of this labeling immediately to warn maintenance personnel about potentially dangerous locations within each facility with respect to electrical equipment arc flash hazard.

The estimated cost for this recommendation is $25,000.

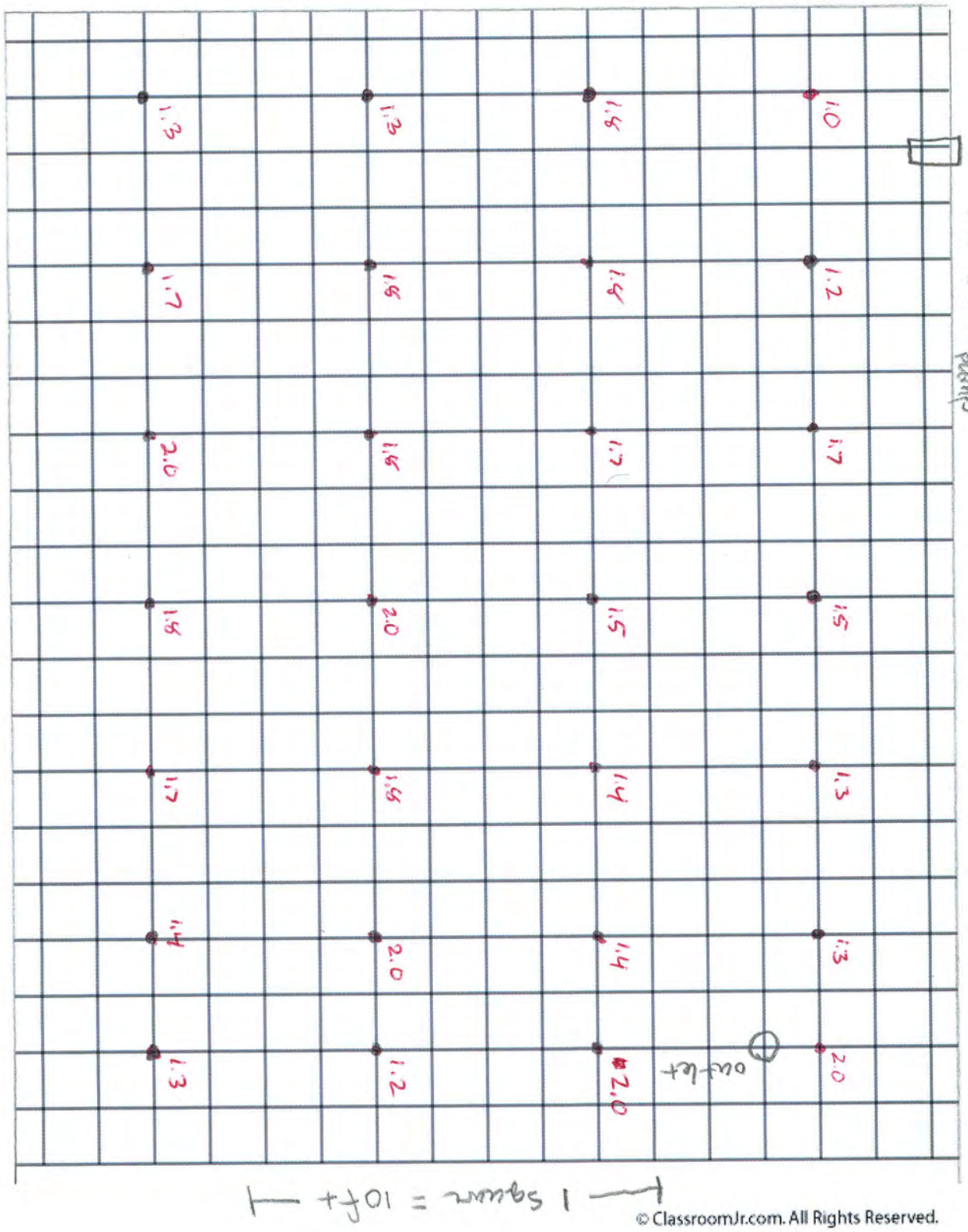
Recommendation No.4: Motor Control Equipment Replacement at Treatment Ponds:

Due to the age of the motor controller equipment at the Treatment Ponds, it is recommended that NMWD include planning within the next 5-year time frame for upgrading the existing motor controls with new equipment.

The estimated cost for this recommendation is $50,000.

APPENDIX F

POND SOUNDINGS



measurements taken on 5/27/15
1 square = 15ft
8' of free board

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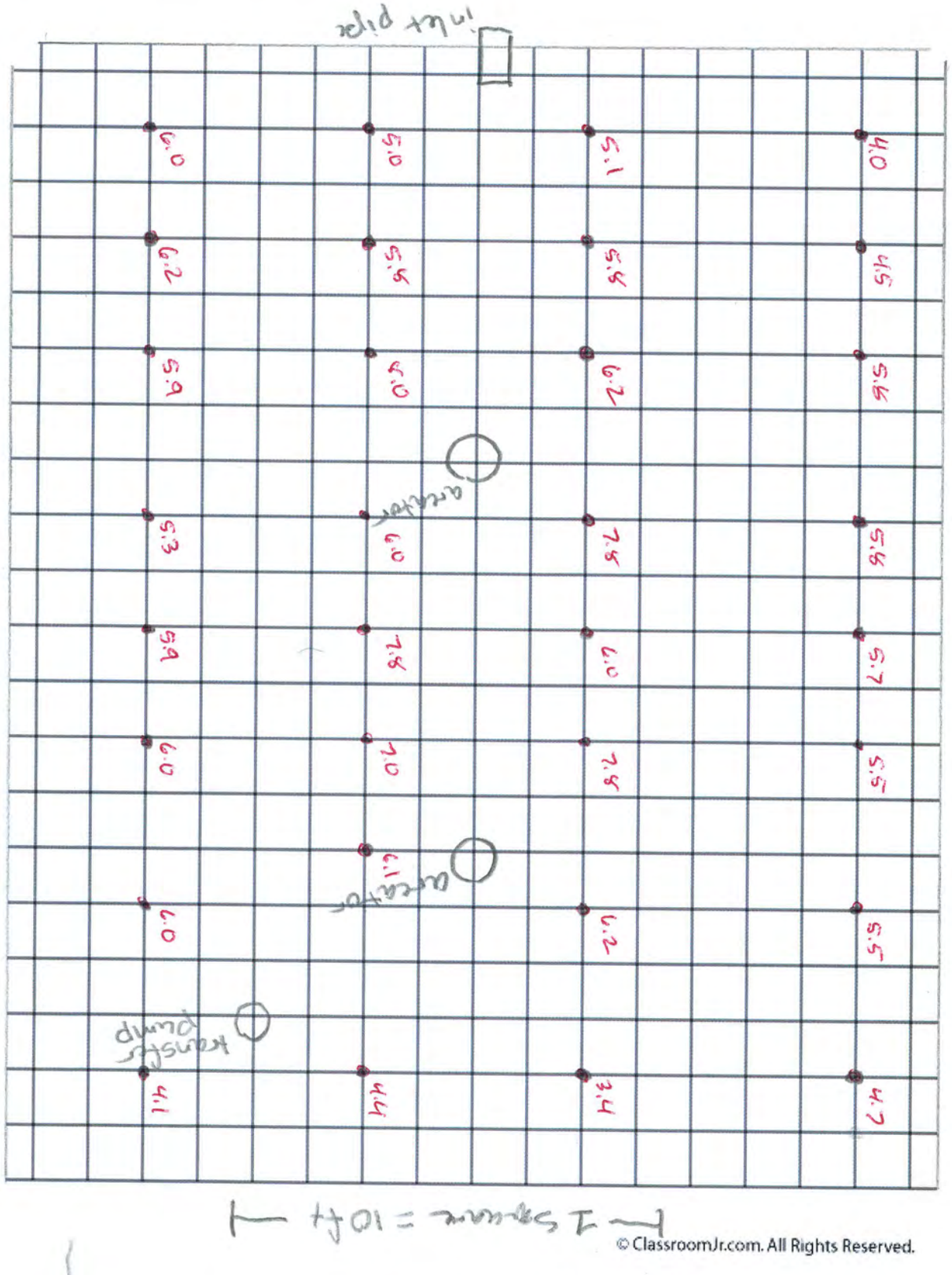

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APPENDIX G

AYS ENGINEERING GROUP, INC.
Review of Dispersal Field Oceana Marin
Sewer System, Oceana Marin
Dillon Beach, California, 5-19-15

Review of Dispersal Field
Oceana Marin Sewer System
Oceana Marin, Dillon Beach California

5-19-15

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AYS is reporting our review of the dispersal field portion of the sewer collection and treatment system for the Oceana Marin subdivision located in Dillon Beach, California. Our review is part of a larger report for the operators of the sewage system for the subdivision, North Marin Water District. This overall report is to review and update the long range master plan for the sewer facilities. Our work is limited to the dispersal field and its operation. AYS is working with Nute Engineering who is reporting on the sewer system as a whole.

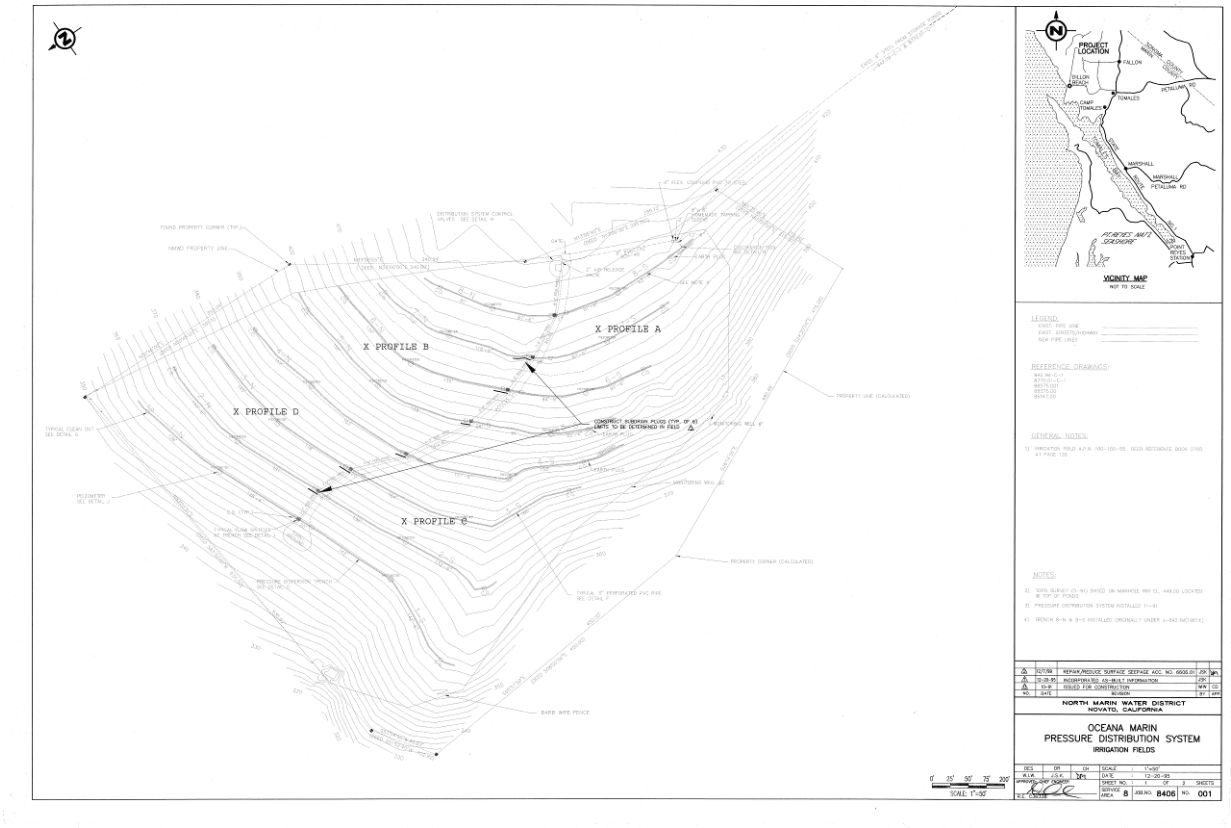
The review team, Nute Engineering and AYS Engineering, met with the North Marin Water Districts personnel 4-16-15 to observe and to review the sewer system for the subdivision. The meeting promptly split up with Ed Nute observing the main pump station and then portions of the sewer collection system and Troy Pearce moving to the dispersal field facility with Vernon Stafford to observe the dispersal field and talk about the operation of the field and how it is conducted. I had already reviewed the "Long-Range Master Plan Update" (Bracewell Engineering December 2005) and had many questions for Mr. Stafford.

The dispersal field is made up of 7 shallow pressure distribution leach lines located in an area with moderately sloping terrain with shallow soils and perched seasonal ground water due to the underlain less permeable clay soils. Another older trench exists at the upper portion of the field which does not match the newer design and is not used as it does not accept much effluent. The dispersal trenches are fed by a dosing siphon with an average dose of approximately 2,200 gallons at an approximate rate of 25 gallons per minute. Effluent is conveyed to each of the 7 operating drain lines for 24 hours and is controlled via an irrigation control panel and automated valves. The individual drain lines average 530 feet long 1.5 feet wide with 24 inches of gravel and 8 inches of soil cover.

The appearance of the drain field looked to be in relatively good condition. Some evidence of cattle in the field was apparent with some of the diversion boxes broken and areas that looked to be trampled in wet conditions. Down slope on the north side of the field showed a small slide that had recently occurred outside of the fence and about 75 to 100 feet from the south end of line #1. The area of the drain field appeared relative dry and was not spongy and no surfacing effluent was apparent.

We rejoined the group at the treatment and storage ponds and to the dosing siphon tanks. The dosing siphon is housed in a concrete cylindrical tank connected to a steel tank just upslope of the dosing chamber. These two tanks connect to act hydraulically as one larger tank. They store effluent from the ponds for a short period of time until the siphon is activated and the dispersal fields are dosed emptying and then refilling via gravity from pipes from the ponds. Staff reports that the steel tank is painted frequently in order to limit corrosion. This area also the injection site for the chlorination system using the tanks as the contact chambers.

At the completion of the tour of the facilities I returned to the dispersal fields and excavated 4- 4" diameter profile holes to a depth of 72 inches to observe the soil conditions at the dispersal field.



Profile A was excavated between drain line 7 and 8 on the South end of the field. The soil was found to have a high clay content very close to the surface and to the total depth of 72 inches. Mottling was noticed with 12 to 24 inched below grade which indicates that this area spends most of the year saturated. Typically areas with these conditions are not good candidates for use as dispersal fields. This may explain why line #8 is not accepting much effluent and is a good reason to abandon this line altogether.

Profile B was excavated between lines 6 and 5 on the north side of the field and found much better soil with 27 inches of very permeable silty loam topsoil over a permeable highly weathered sandstone with no indication of mottling.

Profile C was excavated between lines 2 and 3 on the south side of the field with similar topsoil to 24 inches as in profile B and then a sandy clay that showed some mottling although not nearly as strongly as profile A.

Profile D was excavated between lines 3 and 4 on the North side of the field. The shallow topsoil was very similar to profile B, upslope of it, with a depth of 29 inches then similar soils as B except that they were more clay and had some apparent mottles at 57 inches and deeper. The soil was also moist in this profile possibly as a result of the drain line above having dosed recently.

I would not suggest that my soil work be completely satisfactory for design level work

but they do give an indication to the workings of this system. The soils found here are not ideal for use as a drain field by today's standards. The soil found would not be allowed for use as a septic system of this design for residential use. We would only be able to use mound type septic system in this area with the exception of the area surrounding Profile B which may support a cover fill or shallow pressure distribution type system limited in depth of trench to 36 inches or so (this matches your current design) but in the other areas we would be forced to utilize mound type system in order to satisfy the vertical setback of 36" to suitable soil or ground water. This may be one of the reasons why you are mandated to chlorinate your effluent before dispersing in the field. Attached is the map of the profile holes that were excavated.

I requested as much piezometer well monitoring data as I could get in order to review and summarize this data to determine if any trends could be noticed as to the overall permeability of the soils in the dispersal area. Studies show that permeability of the soils surrounding the trenches of dispersal fields lose permeability over time. This loss varies widely from a very little loss over time with fresh water to clogging being more aggressive with higher strength waste streams. The clogging mechanism appears to be a byproduct of the microbes that aid in the cleansing of effluent. Higher strength waste streams seem to accelerate the clogging process as does high hydraulic loading, less permeable soils and anaerobic soil conditions brought on by ponding effluent inside of the drain field trenches. Current design standards tend to encourage aerobic soil conditions by limiting the use of less permeable soil, using the generally more permeable soil closer to the surface grade and to dose each trench in as small a dose as possible while still providing enough flow to pressurize the laterals of the trenches.

I have not come across much information as to what effect using chlorinated effluent has on the slowing permeability over time effect but would think that with the small residual that you aim for in the field will have a negligible effect on both the beneficial microbes in the soil as well as the anaerobic microbes which appear to have been blamed for the decrease in permeability.

I have been provided the piezometer data from the years '03 and '04 as well as '14 and '15 for my review. While this is not all of the information you have for the dispersal field it does show quite a bit of change over the years in the operation of the dispersal field and gives enough insight to the operation to make some recommendations for the continued operation of the system.

The piezometer data is recorded largely weekly when the dispersal field is in operation. Staff tells me that the system was operated in a manual fashion in the past and I have to assume that the earlier data was during this period of manual operation or that the fields were operated until it was noticed that they were filled and then the next line was put into service. I would also think that this must have been done on a weekly basis.

An irrigation controller and automated valves were more recently added to the system allowing each of the lines to be dosed for a 24 hour period and then taken out of

service with the next line is sequence going into service. The more current data ’14 and ’15 show a more even loading that is more consistent with current design standards of smaller more controlled dosing.

There are clearly differences in the data for this two time periods. One is the current drought conditions for Northern California compared to the normal rainfall totals for the ’03 and ’04 seasons. The other difference is the automated dosing of the more current data versus the manual dosing of the lines during the ’03 ’04 seasons.

I would consider hydraulic overloading of a leach line to occur when it is loaded so heavily that the effluent reaches the cover of the trench. I would say that a system is normally loaded when water reaches the mid point of the effect wall of the trench or the middle of the rock section of a dispersal trench. If we look at the two periods of ’03 and ’04 versus the ’14 and ’15 seasons we see a pretty big difference. The ’03,’04 seasons show hydraulic overloading occurring in 34.82 percent of all the piezometer reads as opposed to 14.76 percent for the more recent period. The difference probably is not due to just the automation of the system but also the drought and also your continued effort to correct infiltration though the conveyance system.

I also received NMWD’s Operations worksheets which show the gallons through the system. The gallons that were conveyed to the dispersal field are represented along with the doses and the meter reads. I received this information for the ’14, ’15 season and not the earlier period with the provided information. It is a simple task to arrive at the gallons per day for which the system is loaded during the monitoring period. This is shown on the attached spreadsheet for the piezometer readings and the data included from the operations worksheet for the loading to the dispersal field.

The data from the piezometer reads and the data from the operation worksheet for the dispersal field loading are the best information available to estimate the effectiveness of your dispersal field. Even with the limited information NMWD has provided it gives some insight to how the system is working. You can, with enough information, also determine the amount of effluent the field can disperse without adverse effect by looking at the loading versus the overall effluent level through the field. Weather, of course, has a great deal to do with the effectiveness of the dispersal field and is not part of the recorded data. Inferences from this data also can be made of the effective infiltration of each of the lines during wet and dry periods with a little more effort.

If rainfall data, such as weekly totals, could make this data even more useful a tool for the determining the basic health of the dispersal field. One could determine how the field reacts to high loadings during both wet and dry weather although it seems that your operation of the dispersal field are mostly a dry weather occurrence.

Recommendations:

I would strongly recommend that someone responsible for the dispersal field be given the task of entering all of your data from the dispersal field piezometers including the active dispersal trench and the loadings from the operations worksheets to a simple

spreadsheet; this along with rainfall data would give NMWD the best indicator of the relative health of the dispersal field. While this spreadsheet is not going to be able to predict with certainty your ultimate capacity it will help toward it by showing how much effect wastewater loading and rainfall effects your overall piezometer levels. The spreadsheet also can show if any decreases over time are appearing in year over year changes. This task would be best for whoever is responsible for the monitoring as it will give them insight to the operation of the system acting like a fuel gauge in a car and the data should be reviewed at first every quarter while the system is in operation.

The cows should be restricted from the dispersal field especially in the wet season weather the field is in operation or not. With only 8 to 12 inches of cover this is especially important to keep the effluent in the trenches not on the surface. Cattle also can cause compaction of the surface of the field especially when wet limiting gas transfer to the trenches which can promote the anaerobic conditions that must be avoided to extend the useful lifespan of the system to its maximum.

The slide adjacent (downslope of the field) should be looked at by a geotechnical engineer to see how much a problem it may be. It also appears to be off the property which may complicate things. I cannot say if the slide has occurred due to the use of the area upslope of it as a drain field. I can say, however, that the hydraulic loading of this area did not help stabilize the area. If the slide area is on another property it may be wise to notify the owner if this has not been done.

The minor corrective work to the distribution boxes that are broken should be corrected but as time allows as it is not an emergency.

I would suggest that you consider reducing the time each line is in service from 24 hours to 12 hours. I would also suggest this be done as a trial while increasing the monitoring (and recording in the spread sheet) to twice weekly. I would expect the hydraulic overloading of each trench to be reduced even more than the 3.5 percent of the reads noticed during the ’14, ’15 season.

During the above period I would also suggest that one of the lines be taken out of service for a period of a month to allow it to rest while watching the rest of the field to see how the increase in effective loading to the remaining lines is tolerated. If this is tolerated during the trial I would suggest that each season one of the seven lines be rested to reduce any bio-slime buildup aiding in the longevity of the system. The data(spreadsheet) for this period should be reviewed carefully to determine if the dosing regimen and the resting of one of the lines should be continued. We will need a good amount of data to see the effects in the system.

The last recommendation would be to come up with a system upgrade/ failure plan. The dispersal field has a huge spacing between individual lines. Normal residential spacing is 7.5 to 10 feet. The spacing between lines in the dispersal field is much greater than this some approaching 50 feet or more. Should the lines of the system begin to fail individually or collectively it could be reinstalled in the space between lines provided this is agreed to by Regional Water Quality Control Board. I would even suggest that this be negotiated now for the future. They may not agree to ahead of

time as they may want to see if better treatment / dispersal technology would be more appropriate in the future but it would be wise to start the planning in the event that this system develop issues over time. Your spreadsheet review will be your best tool in estimating how your system is doing. When your year over years indicate that the effluent levels in the piezometer are not dropping at rates shown in the past then it will be time to come up with your replacement plan. With proper management if is feasible that this system could last for a very long time but even with our best efforts dispersal fields can start developing issues over time.

Date	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	7A	7B	Active	Sump	Cl2	Meter gal	GtF	DtF	Rate	Notes
							inches from grade															
Tot Depth	36	34	34	38	36	34	32	26	33	25	33	34	32	31								
9/18/2002	dry	dry	32	dry	31	dry	19	28	12	11	7	11	14	13		52	0.5					
3/5/2003	dry	dry	26	dry	24	dry	21	dry	29	30	8	13	17	20		51	1.8					
3/12/2003																51	0.4					No inspection because of impending storm.
4/17/2003	35	35	19	34	19	30	15	24	23	23	2	13	17	16		51	.7/1.35					
5/14/2003	dry	dry	dry	dry	27	dry	15	dry	28	23	4	13	18	16		50	1					
5/21/2003	dry	dry	21	dry	22	26	14	18	31	28	dry	dry	dry	dry		50	0.8					Excellent condition
5/30/2003	dry	dry	dry	repair	dry	dry	dry	dry	25	20	22	19	16	16		53						
6/4/2003	dry	dry	dry	dry	31	dry	18	dry	23	26	9	9.5	17	15		51						
6/11/2003	34	dry	21	dry	18	18	11	17	26	25	dry	dry	dry	dry		50						
6/25/2003	29	dry	9	30	13	15	dry	dry	dry	dry	dry	dry	dry	dry		52	not done					
7/9/2003	dry	dry	9	off	14	29	dry	dry								49	0.14					
7/16/2003	dry	dry	26	31	13	15	9	16	19	22	dry	dry	dry	dry		52	0.7					
7/23/2003	dry	dry	28	dry	31	dry	18	27	16	19	8	12	16	16		52	0.4					
7/30/2003	28	dry	8	29	15	16	dry	dry	dry	dry	dry	dry	dry	dry		48						
8/6/2003	dry	dry	32	dry	28	32	17	dry	20	23	3	5	12	12		51	0.44					
8/13/2003	26	dry	6	30	14	14	dry	dry	dry	dry	29	dry	dry	dry		50	0.2					
8/20/2003	dry	dry	dry	dry	27	dry	17	dry	19	24	6	7	15	14		50	0.91					
8/27/2003	25	dry	2	dry	15	14	dry	dry	dry	dry	dry	dry	dry	dry		52	0.16					
9/3/2003	32	dry	8	32	12	11	7	12	13	17	dry	dry	dry	dry		49	not done					
9/10/2003	dry	dry	17	dry	25	29	17	dry	12	13	3	7	13	14		51	0.7					Field soggy at 7N and 6N water seeping down road 7N to 5S Rained day before.
9/17/2003	26	dry	5	32	13	13	dry	dry	dry	dry	dry	dry	dry	dry		49	0.3					
9/24/2003	35	0	8	off	12	11	11	14	17	15	29	0	0	0		50	0.23					
10/1/2003	dry	dry	dry	dry	29	dry	12	16	11	9	3	6	10	13		49	out					
10/8/2003	25	0	4	31	12	12	0	0	0	0	31	31	0	0		49	1					
10/15/2003	dry	dry	19	dry	12	12	10	13	16	17	dry	dry	dry	dry		51	1.2					
10/22/2003	dry	dry	17	dry	28	dry	28	dry	15	17	6	10	13	12		50	not done					A few soggy spots lines 6-7 middle
10/29/2003	dry	dry	29	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry		51						Turned off for season
2/25/2004	31	26	7	23	9	10	3	7	8	9	4	5	14	8		44						field very wet and soggy from discharge and heavy rain
3/3/2004	29	dry	14	31	17	17	5	11	28	27	28	30	dry	dry		39	>2.2					
3/10/2004	32	dry	14	dry	7	dry	16	dry	18	27	10	14	20	18		N/A	1.5					
3/17/2004	27	dry	12	31	18	18	dry	dry	dry	dry	dry	dry	dry	dry		41	1					Wet area below 2N
3/24/2004	33	34	16	31	17	17	15	18	32	30	32	33	33	31		47	1.57/2.00					
3/31/2004	32	34	16	34	18	29	14	24	21	28	10	15	18	18		47	0.78					
4/7/2004																43	0.25					
4/14/2004	34	34	16	34	18	23	16	28	25	32	8	14	17	18		48	1.02/1.82					
4/22/2004	28	dry	7	31	15	15	dry	dry	dry	dry	dry	dry	dry	dry		44	1.2					
4/28/2004	34	34	24	34	22	34	14	27	26	27	5	11	14	15		48	.60/1.2					
5/5/2004	dry	dry	11	31	14	14	8	12	17	17	dry	dry	dry	dry		49	0.4					
5/12/2004	25	dry	5	31	12	11	dry	dry	dry	dry	dry	dry	dry	dry		46	0.66					Soggy aroune #2N
5/20/2004	34	34	30	34	26	34	18	27	28	34	2	4	14	16		51	.21/1.58					
5/26/2004																	not done					Not inspected just rotated trenches
overloaded	0	2	22	1	22	16	22	14	15	12	17	18	17	17			195	40	14		560	34.82%

_	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	7A	7B	Sump	Cl2	Meter gal	GtF	gall/day	DtF	Rate	Notes
							inches from grade															
Tot Depth	36	34	34	38	36	34	32	26	33	25	33	34	32	31								
4/16/2014	32	28	22	33	17	14	12	12	32	33	29	32	off	off	32	0.57	69117.339	221088	31,584.00	105	23	
4/22/2014	33	35	22	31	26	34	26	20	15	17	30	34	32	32	36	1.37	69298.216	180877	30,146.17	86	22	Standing water at sump
4/30/2014																	69298.216	0		0	0	No flow to fields
5/7/2014	36	34	34	38	36	34	32	26	33	25	33	34	32	31	42	off	69300.118	2		0	0	All Fields dry
5/14/2014	23	30	34	34	34	35	27	25	30	35	30	32	33	32	42		69494	194152	27,736.00	99	19.5	
5/21/2014	34	34	31	32	32	30	35	33	25	30	33	30	24	16		0.73	69681	187000	26,714.29	94	14.6	
5/28/2014	35	32	26	33	35	34	16	12	33	35	30	34	32	32	36	1.02	69842	161000	23,000.00	91	17.9	
6/4/2014	35	34	33	34	30	31	28	24	17	18	33	34	32	32	39	8.8	69998	156000	22,285.71	80	18.6	
6/11/2014	35	34	34	34	35	33	29	25	28	32	3	10	32	32	40	8.8	70143	145000	20,714.29	82	15	
6/18/2014	35	35	34	34	35	33	30	25	31	34	24	23	28	26	42	6.5	70291	148000	21,142.86	76	12.5	
6/25/2014	34	34	34	34	36	35	32	25	33	35	33	32	32	32	42	>20	70331	40000	5,714.29	24	2.1	Turned off discharge to fields
7/2/2014															dry	no dischrg	70331	0		0	0	No discharge
7/16/2014															52	off	70331					
7/23/2014																no dischrg	70331					
7/30/2014																	70331					
8/2/2014																	70339	8000	2,666.67		25	
8/13/2014	34	34	31	34	34	33	31	25	24	26	34	34	31	31	43	0.6	70493	154000	14,000.00	83	15	Water boiling up out of hole by Sta 5. Cows in field
8/20/2014	35	34	33	32	35	33	29	27	33	34	16	19	32	31	44	0.4	70627	134000	19,142.86	75	14	
8/27/2014	35	34	26	34	25	34	25	20	33	35	34	34	32	32	36		70733	106000	15,142.86	59		
9/3/2014	35	36	34	34	35	30	32	29	32	35	32	39	32	32	44	off	70789	56000	8,000.00	27	off	discharge to field off
9/10/2014																	70789	0		0	0	
9/17/2014																	70789	0		0	0	
9/24/2014															58	off	70789	0		0	0	
10/1/2014																	70789	0		0	0	
10/8/2014																	70789	0		0	0	
10/15/2014	35	35	35	32	35	35	29	25	33	38	33	35	32	35	71	1.83	70864	75000	10,714.29	41	20	
10/22/2014	35	35	35	32	35	35	30	25	33	35	33	35	32	31	60		70915	51000	7,285.71	27	13	
10/28/2014	35	35	34	34	35	34	32	25	34	34	20	25	32	31	50	4.2	71001	86000	14,333.33	45	9	
11/5/2014																0.1	71171	170000	21,250.00	86	16	Cows in field
11/12/2014	35	31	34	34	36	32	24	29	33	36	21	30	32	32	48	1.08	71324	153000	21,857.14	79	15	
11/20/2014																	71515	191000	23,875.00	92	8	#5 box crushed full of water, 4B mushy cows inside

Date	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	7A	7B	Sump	Cl2	Meter	GtF	gall/day	DtF	Rate	Notes
	inches from grade																gal					
Tot Depth	36	34	34	38	36	34	32	26	33	25	33	34	32	31								
11/26/2014																	71515	0		0	0	
12/3/2014																	71516	1000	142.86	1		
12/10/2014																off	71516	0		0	0	Bull inside, no standing water
12/17/2014																	71516	0		0	0	
12/23/2014																	71516	0		0	0	
1/2/2015																	71516	0		0	0	
1/7/2015	34	34	32	34	35	34	28	25	29	30	7	11	31	31	40	2.2	71666	150,000.00	30,000.00	72	23	Standing water in hoof prints in field 6
1/14/2015	34	34	30	26	34	32	26	31	17	10	18	20	4	10	44	.	71957	291,000.00	41,571.43	114	35	
1/21/2015	17	20	23	34	34	33	19	16	22	26	19	15	29	32	38		72296	339,000.00	48,428.57	120	28	
1/26/2015	26	29	20	23	27	30	11	10	33	36	29	31	32	32	31	0.5	72508	212,000.00	42,400.00	79	28	
2/4/2015	33	dry	32	30	dry	dry	30	dry	dry	dry	35	dry	34	34	30	1.44	72884	376,000.00	41,777.78	143	30	Fields soaking wet, probably from cows, turning off irrigation because of storm coming.Large slide below sump
2/11/2015	29	dry	20	31	31	32	24	24	24	33	21	21	dry	dry	30		72884	off		0	0	Lots or cow evidence still mushy, starting to dry out after storm
2/18/2015	33	dry	32	30	dry	dry	30	dry	dry	dry	35	dry	34	34	38		72884	0.00		0	0	Starting to dry out, Trench 4 south has lost 11" of Pizo depth now measures 25" top to bottom
2/25/2015	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	44		72884	0.00		0	0	No water in any field all in good condition, Irrigation restarted #4 first field
3/4/2015																none	73138	254,000.00	36,285.71	111		replaced hydro pump
3/11/2015	34	34	27	34	32	34	28	25	34	29	11	10	32	32	40	.85/2.2	73287	149,000.00	21,285.71	82		
3/18/2015	dry	dry	dry	dry	dry	dry	26	dry	20	25	20	21	16	16	43	1.1	73498	211,000.00	30,142.86	100	25	
3/25/2015	19	27	33	dry	dry	dry	28	dry	30	28	26	26	24	28	N/A	na	73701	203,000.00	29,000.00	101	25	Good condition, cows getting in sometimes.
4/1/2015	31	36	12	15	36	33	32	25	33	32	28	30	32	31	36	2.2	73890	189,000.00	27,000.00	N/A	19	
4/8/2015																	73961	71,000.00	10,142.86	141	0	
4/15/2015																	73961	0.00		0	0	Field is off
4/22/2015																	70961	0.00		0	0	
	3	1	5	2	1	1	6	7	6	3	11	9	4	3	62	30	14	420		14.76%		

11

ITEM #11

MEMORANDUM

To: Board of Directors January 15, 2016

From: Chris DeGabriele, General Manager CD

Subj: Marin LAFCO Countywide Water Service Study Final Report – NMWD Comments
t:\gm\lafco\memo to bod re final comments.docx

RECOMMENDED ACTION: Information Only

FINANCIAL IMPACT: None at this time

Attached please find the District's comments on the Subject Marin LAFCO Countywide Water Service Study Final Report. The majority of our comments are consistent with those submitted to LAFCO in September 2015 commenting on the Draft Report. Pertinent excerpts from Marin LAFCO's report are also included herein. The Final Report has referenced documentation provided by NMWD that overall system water demands have decreased over the past 20 years, but the Final Report does continue to reflect Marin LAFCO's independent analysis and projections which are based on a 5-year average of data from 2009 through 2013. This data is not weather normalized for water demand analysis and we believe it's too short a time span to substantiate many of the determinations included in the report.

Notwithstanding, this concern the Final Report is very comprehensive and Marin LAFCO's independent analysis is not likely to change at this point. Marin LAFCO staff anticipates that the LAFCO commission will consider the Final Report over two meetings, January 14th and February 11th. Comments on the Final Report were requested by January 13th, thus the comment letter was not reviewed by the NMWD Board before it was submitted.

I attended the January 14th Marin LAFCO meeting and reinforced our letter with verbal comments. Marin LAFCO tentatively accepted the Final Report as written subject to written comments received and incorporated by Marin LAFCO staff. The Public Hearing on the Recommendations and Determinations will remain open and be considered at the Marin LAFCO February 11, 2016 meeting.

NORTH MARIN
WATER DISTRICT

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January 13, 2016

Keene Simonds, Executive Officer
Marin Local Agency Formation Commission
555 Northgate Drive Suite 230
San Rafael, CA 94903

Re: Marin LAFCO Countywide Water Service Study Final Report – North Marin Water District Comments

Dear Mr. Simonds:

Thank you for the opportunity to comment on the Final Report of the subject study. Over the past 22 months, NMWD has had an opportunity to comment on the Agency Profiles and the August 2015 Draft Report prepared by Marin LAFCO for NMWD's Novato and West Marin service areas. NMWD staff has provided data as requested to Marin LAFCO and made extensive comments, many of which have been incorporated or addressed. We understand that the subject study reflects Marin LAFCO's independent projections of population, water demand and water supply and do not match data provided by and used by NMWD. We remind Marin LAFCO and the public that the analysis included in the report is based on a short, 5-year average of data available, and is not weather normalized for water demand analysis. We appreciate that the Final Report includes recognition of documentation provided by BCPUD, IPUD and NMWD "...attesting that...overall system demands have decreased..." **(Section 2.2 A, p.2-9).**

Nevertheless, we again direct Marin LAFCO and the general public to the NMWD information provided previously which NMWD believes does not support the written determinations reflected in the report, specifically Sections **2.3 C.4.**; **2.3 D.2.,3.,4.**, and **5.**; **2.3 D.13; 2.3 D.14.a)** thru **c)**; **2.3 F.3.**; **2.3 F.9.**; (see also NMWD comment to **Recommendation 13**); and **2.3 H.1.** (see comment also on **Recommendation 14**).

With regard to the **Recommendations** identified in Section **2.2 B.** NMWD specific comments follow:

- **6**: We believe all six affected agencies are currently making a concerted effort towards pursing supply enhancements to complement ongoing conservation programs and remain fully accountable to future customers resulting from new growth. For NMWD these efforts are reflected in our Urban Water Management Plans, Long Range Capital Improvement Plans, work with the North Bay Watershed Association, North Bay Water Reuse Authority and the Water Advisory Committee of Sonoma County Water Agency.
- **11**: NMWD remains cautiously interested in Marin LAFCO's consideration to expand our sphere of influence to account for existing NMWD outside service agreements.
- **12**: NMWD does seek a boundary change to detach approximately 7,700 acres of unincorporated land from the District that includes Tomales Bay and the Marshall area.
- **13**: Should Marin LAFCO desire to undertake a study considering

DIRECTORS: JACK BAKER • RICK FRAITES • STEPHEN PETTERLE • DENNIS RODONI • JOHN C. SCHOONOVER
OFFICERS: CHRIS DEGABRIELE, General Manager • KATIE YOUNG, Secretary • DAVID L. BENTLEY, Auditor-Controller • DREW MCINTYRE, Chief Engineer

consolidation of NMWD and Marin Municipal, NMWD would expect to actively participate in developing the scope of work, consultant selection and the assessment, but has no desire to participate in the cost of such a study since NMWD water ratepayers have not indicated any interest in such a consolidation.

- **14**: NMWD continues to believe that the recommendation to explore and discuss the potential to establish community wastewater systems within the West Marin area is entirely out of context in this water service study, should not be included as a recommendation and should not be undertaken. We suggest that any study to explore potential community wastewater systems should be undertaken at the behest of the specific community where onsite wastewater systems are found to cause widespread negative impacts to water quality as reported by Marin County Environmental Health Department, not by Marin LAFCO.

Specific Comments on the other sections of the report follow:

Section 2.1 B, p. 2-4, Benchmarking Pension Obligations

Note that Fitch Ratings agency generally considers a pension plan funded at 70% or above to be adequate (See: http://www.ncpers.org/Files/2011_enhancing_the_analysis_of_state_local_government_pension_obligations.pdf).

Section 2.3 C.4, p. 2-17

"...NMWD (Novato) – are expected to reach supply capacity relative to annual demands by 2023."

This determination is not correct and not consistent with the NMWD Profile included in Section 4. See Final Report page 4-174 which states: "This ratio is expected to rise by to near capacity at 97% by 2023."

Section 2.3 C.19.e, p. 2-25

Note that a typographical error exists in the abbreviation of NMWD (MWD's).

Section 2.3 E.3, p. 2-29

The referenced North Bay Water Reuse Authority is not a "joint-powers" authority as so stated in the write up, but is formed pursuant to a Memorandum of Understanding among the participants.

Section 4.2 B.1.0, p. 4-141

"The average daily water demand per resident in MMWD's Novato and Point Reyes Station systems..."

Please correct the typographical error referencing MMWD (should be NMWD).

Section 4.2 B.3.4, Table 4-114 (NMWD), p. 4-148, footnote 193

"As of 2001, all outside service extensions are require to request and receive Commission approval under G.C. Section 56133..."

NMWD believes all of its' active outside water service connections have been

reviewed/approved by LAFCO or its precursor County Boundary Commission at the time service was initiated.

Section 4.2 B.5.2, Table 4-117 (NMWD), p. 4-153

Note that NMWD Board positons have changed. John Schoonover is now President and Stephen Petterle, Vice President.

Section 4.2 B. 6.1, p. 4-155

The bubble note on this page states: "The Novato system's primary potable supply is the Russian River and secured through a contract with SCWA: a dependent special district of the County of Sonoma."

Please be advised that Sonoma County Water Agency (SCWA) was formed in 1949 by a special act of the California Legislature and is not a depended special district but a separate legal entity. The governing act empowers the Sonoma County Board of Supervisors to act as the SCWA Board of Directors.

Section 4.2 B.6.5, p. 4-166

"...Zone Three serves users from 200 to 400 feet in elevation above sea level and includes the unincorporated Atherton Avenue area..."

Please note that Zone 3 also includes the Wild Horse Valley/Center Road/Upper Trumbull, Cherry Hill, Dickson/Woodland Heights and Winged Foot areas of Novato.

Thank you for the opportunity to comment.

Sincerely,

Chris DeGabriele
General Manager

CD/kly

t:\gm\lafco\nmwd comments lafco countywide water study final report.doc

Cc:
Jennifer Blackman, BCPUD General Manager
Krishna Kumar, MMWD General Manager
Scott McMorrow, IPUD General Manager
Ed Schmidt, SBCWD General Manager
Steve Wynne, MBCSD General Manager

CHAPTER TWO
EXECUTIVE SUMMARY

2.1 OVERVIEW

A. Study Purpose

This study represents Marin LAFCO's scheduled countywide municipal service review on water service that has been prepared by staff and consistent with the scope of work approved by the Commission. The underlying aim of the study is to produce an independent assessment of public water service in Marin County over the next five to ten years relative to the Commission's regional growth management duties and responsibilities with particular focus on *potable* retail services (emphasis). This includes evaluating the current and future relationship between supply and demand countywide and within the service areas of the six affected agencies subject to the Commission's oversight. Information generated as part of the study will be directly used by the Commission in (a) guiding subsequent sphere of influence updates, (b) informing future boundary changes, and – if merited – (c) initiating government reorganizations, such as special district formations, consolidations, and/or dissolutions.

> The underlying purpose of the study is to independently assess the relationship and influencing factors therein between countywide potable water supplies and demands relative to the Commission's regional growth management duties under State law. Information generated in the study will (a) guide subsequent sphere updates, (b) inform future boundary changes, and (c) if merited serve as the source document to initiate a government reorganization.

B. Key Assumptions and Benchmarks

The study has been oriented in scope and content to serve as an ongoing monitoring program on potable water services in Marin County. It is expected the Commission will revisit the study and key assumptions and benchmarks therein every five years consistent with the timetable set by the Legislature. This will also allow the Commission – among other items – to assess the accuracy of earlier projections and make appropriate changes in assumptions and benchmarks as needed as part of future reviews. Key assumptions and benchmarks affecting this study's scope and content follow.

Setting the Study's Timeframe

The timeframe for the study has been oriented to cover the next five to ten period with the latter (five years) serving as the analysis anchor as contemplated under State law. Markedly, this timeframe is consistent with the five-year legislative cycle legislatively prescribed for municipal service reviews under G.C. Section 56430 while

providing the Commission flexibility in scheduling its next review on potable water services in alignment with resources and priorities.[7]

Determining the Data Collection Range or Study Period

The period for collecting data to inform the Commission's analysis and related projections on growth, demands, and finances has been set to cover the five-year period from 2009 to 2013. This data collection period – which covers the 60 months immediatley preceeding the start of work on the study – puprosefully alligns with the five-year timeline for the study with the resulting data trends appearing most relevenat to the Commission in making near-term projections (i.e., data from the last five years is most pertient to project trends over the next five to ten years).

Calculating Population Estimates

Residential population calculations in the study have been independently made by Commission for both past and near-term future projections within all seven affected service areas. Past population projections for the service areas are based on applying a region specific person-per-household amount for every residential connection of 2.8 in West Marin and 3.3 in East Marin; a method that serves as a hyprid of the population calculation contemplated for community water systems under State law.[8] Near-term projections have been similarly calculated for the next five to ten year period based on applying forward the estimated growth trend in each service area over the last five year period with limited exceptions (i.e., population growth between the last five years is expected to hold over the next five to ten years.)

Distinguishing Residency Types

The study distinguishes between (a) fulltime or owner-occupied households versus (b) part-time or non-owner occupied households in step with calculating population calculations; the latter category being particular relevant to the West Marin's service areas given the influence of seasonal demands. This calculation has been independently made by the Commission and based on taking the total number of housing units assigned to all developed residential lots within each agency's service area(s) and developing a percentage of those associated units with local ownership addresses versus those with non-local mailing addresses. The resulting percentages have been applied to the separately calculated population totals for each service areas as described above to produce residency type projections.

[7] Incorporating projections 10 years out also allows the Commission to proceed with an applicant request for a sphere of influence amendment involving one of the affected agencies within the time period without the concurrent need for a new stand-alone municipal service review unless otherwise desired by the membership.

[8] Reference to California Code of Regulations Section 64412.

Making Growth Projections at Buildout

The study includes a cursory review of population and housing totals at buildout for purposes of telegraphing long-term growth as it relates to both poplation and housing units within each affected agency's service area(s). Housing unit projections at buildout are based on a review of all 12 land use authorities existing housing elements and specific to zoning within existing jurisdictional boundaries.[9] Population projection totals at buildout are similarly based on applying a region-specific person-per-house amount for every projected housing unit divided between 2.8 and 3.3 in the West Marin and East Marin service areas, respectively.

Quantifying Water Supplies

The study quantifies available water supplies for all six affected agencies and within their seven respective service areas under two distinct planning conditions: (a) normal and (b) single dry-year drought. The study further quantifies water supplies under both planning conditions between daily and annual alllowances with the former being particularly pertient to matching up with peak-day demands. Specific methods and rationales made in quantifying water supplies follows.

- Quantifying supplies under normal conditions is prefaced on reviewing each agency's registered rights and/or permits with the State Water Resources Control Board (surface and underflow) coupled with incorporating other groundwater and contracted sources. Infrastructure constraints – such as pumps and pipelines – are subsequently considered in developing maximum accessible supplies under "normal" conditions for all seven service areas.

- Water supplies under single dry-year conditions – which provides a baseline reliability standard to assess system capacities – are derived from one of two sources. The first and preferred source derives from using the agencies' own calculations if performed; the latter of which applies in this study to only the two East Marin service areas. All other agencies' single dry-year supplies for the remaining five service areas in West Marin have been calculated by the Commission and consistent with methods established by the State Department of Water Resources to relfect 1976-1977 conditions.

Focus on Overall Production

The study and its analysis focuses on overall water production generated within each affected agency's service area(s), and as such incorporates demands for both metered and non-metered uses. This broader focus provides a more accurate account of actual system demands now and going forward given the inherent occurance of water losses and line flushing.

[9] Buildout estimates do not take into consideration future changes in boundaries as well as outside service commitments.

Calculating Future Water Demands

Future near-term water demands have been calculated in the study through 2023 within each affected agency's service area(s) based on overall production trends that occurred in the preceeding five-year period between 2009 and 2013. These projections – and at the request of the affected agencies in reviewing initial adminstrative drafts – have been generated using linear regression to *control* for large variances in the recent five-year totals (emphasis). Addiitionally, extreme production annolmalies were also considered on a case-by-case basis and in one instance resulted in an agency's projections being calcuated using only four years of prior annual demand totals due to excessive system flushing in 2013 (BCPUD).

Benchmarking Infrastructure Needs and Deficiencies

The study focuses on each affected agency's ability to meet their maximum day demands (i.e., highest single day water use during the year) within their service area in assessing the adequacy of supply, treatment, and strorage. Additionally, and to control for variances, the study uses the composite maximum day demand averaged within each service area between 2009 and 2013. These benchmarks are consistent with the State's adopted waterwork standards that requires all public water systems have source (supply and treatment) and storage capacities to meet their maximum day demands as a whole as well as in each pressure zone.[10]

Benchmarking Financial Solvency

Three diagnostic tools are used in the study to assess and make related determinations on each affected agency's financial sovlency based on a five-year review of audited statements from 2009 to 2013. These diagnostic tools – (a) current ratio, (b) debt-to-net assets, and (c) operating margin – collectively provide the Commission with reasonable benchmarks to asses liquidity, capital, and margin and calculated to track both five-year trends as well as final year standing.

Benchmarking Pension Obligations

Three diagnostic tools are used in the study to assess and make related determinatinons on the strength of the pension obligations for the five affected agencies that provide employees with defined retirement benefits; all of whom have contracts with the California Public Employees Retirment System (CalPERS).[11] These diagnostic tools – (a) funded ratio, (b) unfunded liability, and (c) active-to-retiree ratio – have been calculated by the Commission based on the three most recent pension statements issues by CalPERS covering 2011 to 2013. (Earlier data is not readily accessible at this time.) Further key benchmarks herein include tabbing 80% as the minimum threshold for an adequate funded ratio.

[10] Reference to Public Resources Code Section 64554.
[11] Only MBCSD does not have retiree obligations with respect to pension benefits.

C. Study Organization

This chapter serves as the Executive Summary and outlines the key conclusions and findings generated within the study. This includes addressing the mandatory service and governance factors required by the Legislature anytime the Commission performs a municipal service review. The Executive Summary is preceded by a review of key countywide service characteristics (Chapter Three) underlying potable water services. This includes providing regional and agency comparisons with respect to demographics, supplies, demands, and costs now and going forward. The third and final section involves individual agency profiles (Chapter Four) of all six affected public service providers responsible for providing retail potable water under the Commission's jurisdiction in Marin County. These profiles transition between narrative descriptions of the historical background and development of these agencies' service areas to quantifying specific data-driven categories, such as population and growth trends, water service capacities, and financial standing. Supplemental information on recycled water supplies, private water service providers, and watersheds is provided as appendices.

D. Affected Public Agencies

The study examines the services provided by the six public agencies directly providing retail potable water services in Marin County. These six affected agencies are divided by region and listed below.

West Marin Agencies	East Marin Agencies
Bolinas Community Public Utility District (BCPUD)	Marin Municipal Water District (MMWD) *
Inverness Public Utility District (IPUD)	North Marin Water District (NMWD) *
Muir Beach Community Services District (MBCSD)	- Novato System
Stinson Beach County Water District (SBCWD)	- Point Reyes Station System

* All six public agencies provide retail potable water services. Marin Municipal Water District and North Marin Water District also provide retail non-potable water services within limited portions of their service areas with supplies partially provided by the Las Gallinas Valley Sanitary District and the Novato Sanitary District. An overview of these non-potable services is provided as an appendix.

E. Study Review Opportunities

Consistent with the approved scope of work this study has been prepared with an emphasis in soliciting outside public review and comment as well as multiple opportunities for input from the affected agencies. These efforts are summarized below.

- Commission staff appeared before five of the six affected agencies' governing bodies at public meetings prior to the initiation of the study to discuss the scope of work and possible outcomes byway of the Legislature's direction (i.e., sphere amendments, boundary changes, and formations and/or consolidations).[12]

[12] Staff did not make a presentation to BCPUD's Board.

- Administrative copies of all agencies profiles with focus on technical data were provided to the affected agencies for their internal review. Comments received from the agencies were incorporated as needed into completed draft profiles.

- Draft profiles on all agencies were presented to the Commission by region (West and East) for initial discussion and feedback at noticed public hearings between January and May 2015. Notices were subsequently circulated inviting review and comments over a 75-day periods after each presentation. Copies of the draft profiles were also posted on the Commission website.

- A complete draft report was presented to the Commission at a noticed public hearing in September 2015 with a notice subsequently circulated inviting review and comments over a 60-day period. A copy of the draft report was also posted on the website. Copies were also sent to all six affected agencies and all West Marin library branches.

- Commission staff appeared before several city/town councils to solicit public review and comment on the draft profiles and/or draft report. Presentations were made to Corte Madera, Novato (twice), San Rafael (twice), Fairfax, and Mill Valley as well as the County of Marin Board of Supervisors (twice). Presentations on the draft were also made to Marin County's League of Women Voters, Marin Coalition, and Marin Conservation League.

2.2 STUDY SUMMARY

A. General Conclusions

This study identifies fourteen central themes or conclusions underlying the Commission's review of the availability, capacity, and performance of public water services now and going forward relative to the agency's regional growth management duties. These conclusions range in substance from recent usage trends to financial standing and are entirely generated from information detailed in the succeeding sections. Additionally, and as previously detailed, these conclusions are premised on the Commission's own independent assessment relative to LAFCO's growth management interests and drawn from the information collected and analyzed between a five-year period of 2009 to 2013.

The study's general conclusions are based on data collected and analyzed by the Commission between 2009 and 2013 and specific to LAFCO's prescribed growth management interests under State law.

- **No. 1 | Significant Influence of Public Water Systems**
  The six affected agencies organized to provide public water service directly effect nearly every resident in Marin County. This relationship is marked by the six agencies' water systems collectively serving an estimated 256,230 total residents

within their seven service areas that accounts for 98% of the entire countywide population as of the term of this study.[13]

- **No. 2 | Strong Civic Engagement Among Agencies**
  There appears to be relatively high engagement existing between all six affected and their constituencies that helps produce governing boards largely responsive to community needs with no obvious discord; needs that nevertheless vary due to regional and subregional distinctions in social and economic interests.

- **No. 3 | Recent Growth Has Been Proportionally Higher in West Marin**
  Overall resident growth within the six affected agencies' service areas over the five-year review period of this study has been modest with a total estimated change of 0.40%. This change is nonetheless noteworthy given it counters historical trends with the proportional intensity being more than two times greater in West Marin's service areas at 1.00% compared to 0.38% in East Marin's service areas.

- **No. 4 | New Growth Will Occur - Albeit Less Intense than Others Estimate**
  The six affected agencies are collectively at 90% of their current planned buildout and additional residential growth is expected in the near-term, albeit at measurably less intensities than projected by other regional governing bodies. This includes the Commission estimating six of the seven service areas will collectively add close to 2,000 new residents over the next 10 year period and result in a joint annual growth rate of 0.08% through 2023; a rate that is close to recent changes and five times less than the 0.43% annual projection calculated for the county for the period by the Association of Bay Area Governments (ABAG).[14]

- **No. 5 | Buildout Will Add 30,000 New Residents to Public Water Systems**
  The seven service areas are positioned to add an additional 30,000 new residents based on present-day buildout assumptions made by the local land use authorities. [15] These buildout assumptions – which will presumably increase going forward given the State's legislative intent to facilitate housing opportunities – would result in a net increase of 11.5% (or 4,166 acre-feet) in annual demands over current year-end averages, and further stress systems already projected with deficits in single-dry year conditions.

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[13] The term end of the study is 2013. The six affected agencies – BCPUD, IPUD, MBCSD, SBCWD, MMWD, and NMWD – collectively include seven service areas with NMWD serving two: Novato and Point Reyes Station. There are also an estimated 3,250 residents in Marin County that lie outside the seven areas and dependent on either private water companies and or private groundwater/spring sources. (This estimate does not consider parcels within the seven service areas that have not established connections to the public water systems.)

[14] No new residential growth is expected within the next 10 years in BCPUD's service area due to the ongoing moratorium on new water service connections.

[15] The 12 land use authorities (County of Marin and the 11 cities in Marin County) collectively contemplate up to 8,810 new housing units – producing a projected 28,728 additional residents – may be constructed in the seven service areas at buildout based on current land use policies.

- **No. 6 | Regional Factors Have Influenced Public Water Systems Differently**
There are substantive demographic and related distinctions existing between East and West Marin's service areas that have pronounced and different influences on their respective water systems now and going forward. Examples follow.

  - Residency type within the two regions is significantly different with part-time or non-owner residents making up an estimated 50% or more of the combined population within West Marin's five service areas. The estimated portion of East Marin's two service areas dedicated to part-time or non-owner residents, comparatively is estimated at 20%.

  - The regional distinction in residency type helps explain why peak-day ratios (i.e., the difference between average day-use and single highest day-use) in West Marin are 25% above East Marin, and as a result the former service areas have proportionally greater system stresses in meeting high-usage periods.[16]

  - Recent census data shows stark and growing differences between East and West Marin's service areas with the latter being significantly older and having lower household incomes compared to the former.[17] These differences – which are also reflected in increasingly higher unemployment in West Marin despite having a greater share of residents falling within the prime working age (25 to 64) – suggest increasing challenges for the West Marin agencies in funding water operations and improvements over the long-run.

  - Differences in the affected agencies' economies of scale helps to explain why the medium rate for potable water in West Marin is $1.28 for every 100 gallons compared to $0.70 for every 100 gallons in East Marin; almost a twofold difference between the regions.

- **No. 7 | Recent System Demands Have Intensified for Most Agencies**
Relative demand – i.e., agency production measured by residents – during the study's five-year term has increased for five of the seven service areas in recent years. These increases, which affects BCPUD, IPUD, MBCSD, SBCWD, and NMWD-Novato, have all exceeded the corresponding change in population growth within the respective service areas by no less than threefold and signals system usage intensity – and not new development – has been underlying increases in demands. Additionally, and pertinently, this dynamic suggest overall usage

16 Peak-day ratios over the five-year period reviewed in this study show West Marin's five service areas averaged 2.0 compared to 1.6 in East Marin's two service areas.

17 The median age within the five West Marin service areas is 53.5 and is nearly one-fourth higher than the median age of 43.9 within the two East Marin service areas. (This separation is also increasing with the median age rising by 6.9% over the prior five-year period in West Marin compared to only 0.7% in East Marin.) A similar separation exists with respect to median household incomes with West Marin's five service areas averaging $71,000 compared to $93,000 in East Marin's two service areas.

trends will likely revert and increase from their most recent decline in 2015 in response to public calls for conservation once the drought is declared over.

* **It is pertinent to highlight this conclusion is specific to recent trends generated within the five-year review period incorporated into this study (2009-2013). Three agencies – BCPUD, IPUD, and NMWD – have provided documentation to the Commission attesting that their overall system demands have decreased based on a longer sample size of 20 plus years. Copies of these submittals is provided in the appendices.**

- **No. 8 | Supplies Under Normal/Maximum Conditions are in Good Shape**
Existing potable water supplies are sufficient for all six affected agencies to meet current annual demands within the seven service areas under normal and non-peak conditions now and through the end of this study period in 2023. This sufficiency is marked by noting the individual agency annual demand-to-supply ratios range from a low of 15.1% for IPUD to a high of 76.3% for BCPUD with minimal changes for any expected over the next 10 year period. Individual agency peak-day demand-to-supply ratios are generally much higher but remain well within capacity for most of the agencies with the lone exception of BCPUD, which currently tallies 82.7% and expected to rise to capacity at 96.4% by 2023.

- **No. 9 | Supplies Under Projected 1976/77 Conditions Create System Stresses**
Projected single dry-year conditions paralleling 1976/77 show moderate to significant system stresses for five of the seven service areas based on current and/or projected demands through 2023. The agencies with one or more supply deficits under single dry-year conditions when use and demand patterns have not adjusted are BCPUD, MBCSD, SBCWD, MMWD, and NMWD-Novato. The agencies with the most substantive deficit demand-to-supply ratios are BCPUD and MMWD with both having shortages in all four demand-to-supply categories measured by the Commission.

- **No. 10 | Treatment Capacities are Sufficient With Some Exceptions**
Nearly all of the affected agencies have existing treatment capacities and/or contracts therein to accommodate their five-year average peak-day demands within their respective service areas. The lone immediate exception involves BCPUD whose average peak-day demand equals 103% of the agency's maximum daily treatment capacity and is on pace to reach 107% by 2023. Two other agencies – IPUD and SBCWD – are projected to have their peak-day demands reach their respective daily treatment capacity by 2023.

- **No. 11 | Storage Capacities are Sufficient**
  All six affected agencies have existing overall storage capacities to accommodate their current five-year average peak-day demands within their respective service areas and all have at least 50% additional capacity with minimal changes expected over the next 10 years; all of which helps to mitigate against any treatment shortfalls. (There is an individual zone shortfall for MMWD involving Ross Valley.) However, and while not explicit deficit, it is pertinent to note three of the seven service areas have less than three days of potable storage capacity to meet continuous peak-day demands – such as a summer-time fire incident – without recharge. The agencies with less than three days of continuous peak-demand storage are NMWD-Point Reyes at 2.2, MMWD at 2.3, and NMWD-Novato at 2.4.

- **No. 12 | Current Drought Does Not Compare to 1976/77 in Marin County**
  The current four-year drought has generated significant and adverse impacts for many communities in California, but not necessarily to date in Marin County. Recent local rainfall totals, markedly, have remained relatively close to historical averages with the notable outlier of 2013 when totals reached only 7.8 inches and fell close to six times below the average tallied over the prior 50 years.[18] Further, rainfall totals have averaged close to one-fourth more each year during the current drought compared to annual averages during the 1976/77 drought.[19] These collective factors affirm utilizing the 1976/77 drought as the benchmark in projecting single dry-year conditions remains appropriate for planning purposes.

- **No. 13 | Near-Term Finances are Good; Long-Term Finances are Mixed**
  All six affected agencies have maintained positive current ratios over the five-year review period and finished at no less than 4 to 1; meaning the agencies at a minimum ended with $4 in current assets for every $1 in short-term liabilities/obligations. This measurement paired with positive ending operating margins of no less than 8.6% show the agencies' water systems have been generally well-funded and void of structural deficits, and as such indicates near-term finances are in good shape. Similar measurements for long-term solvency, however, are mixed and highlighted by three of the six agencies – SBCWD, MMWD, and NMWD – all ending the five-year period with debt-to-net asset ratios approaching 50%; meaning $0.50 of every $1.00 in assets has been financed by debt. All five agencies with pension obligations – BCPUD, IPUD, SBCSD, MMWD, and NMWD – are also underfunded with only one – BCPUD – finishing the most recent reporting period with a funded ratio above 80%

[18] Average annual rainfall amounts measured at the Mount. Tamalpais station (Kentfield) between 1962 and 2011 totaled 47.6 inches. Annual rainfall amounts over the current 2012-2015 statewide drought totaled 57.5 inches in 2012, 7.8 inches in 2013, and 48.3 inches in 2014.

[19] Average annual rainfall amounts measured at the Mount Tamalpais station near Kentfield during the 1976-77 drought totaled 30.8 inches (20.6 inches in 1976 and 40.9 inches in 1977).

- **No. 14 | Conservation Has Limitations; Additional Supplies are Needed**
  All six affected agencies have been diligent in pursuing conservation savings in their respective service areas with all appropriately focusing on community education and the larger – MMWD and NMWD – offering various rebate programs. And while conservation is the best and most efficient tool to manage demands it would be prudent planning for all agencies to renew efforts to develop additional supplies - and in particular potable - by enhancing existing sources and/or establishing new sources; a focus that appears to have been generally deemphasized in recent years. This planning is particularly pertinent given non-potable offset opportunities appears limited for most Marin County lands coupled with the narrowing demand-to-supply ratios for the majority of agencies with most projected to have shortfalls under single dry-year conditions.

- **No. 15 | Climate Change Requires Adaptive Planning**
  It is relatively certain Marin County will encounter increasingly serious climate impacts due to higher temperatures, more frequent droughts, and rising salt water levels that – among other things – will adversely affect all six affected agencies in terms of supplies, demands, and source quality. These impacts in turn affect the Commission in its directive under State law to produce orderly growth and development consistent with current and future community needs. These factors underlie the need for adaptive planning now and going forward to improve our collective understanding of water-related risks from climate change and to explore and implement strategies to reduce these risks in Marin County.

B. Recommendations

The following recommendations call for specific action either from the Commission and/or by the affected agencies based on information generated as part of this study and outlined below in order of their placement in Section 2.3 (Written Determinations). Recommendations for Commission action are dependent on a subsequent directive from the membership and through the adopted work plan.

1. The Commission should proactively work with local agencies – and in particular water, sewer, and fire providers – to develop a definition of "disadvantaged unincorporated community" consistent with SB 244 to ensure an appropriate and equitable level of municipal services is available for qualifying areas.

2. BCPUD should consider expanding its treatment facility capacity to abate shortfalls in meeting current and projected peak-day demands relative to agency resources and priorities as part of a future capital improvement program.

3. MMWD should consider expanding potable storage in the Ross Valley service zone to abate existing shortfalls and accommodate current and projected peak-day demands relative to agency resources and priorities as part of a future capital improvement program.

4. The Commission recommends the West Marin agencies – BCPUD, IPUD, MBCSD, and NMWD (Point Reyes Station) – jointly prepare a water reliability report assessing each system's available supplies under different hydrologic periods based on shared planning assumptions.

5. All six affected agencies should continue to pool their respective resources in joint procurement processes to secure services and supplies given their combined buying power produces cost-savings on items of mutual need and benefit. A prime example includes NMWD and MMWD's beneficial agreement to share capacity and costs therein in the North Marin Aqueduct and its delivery of potable water allocations from Sonoma County.

6. The Commission encourages all six affected agencies to establish and or advance supply enhancement efforts to complement the ongoing focus on conservation to remain fully accountable to future constituents given new growth will occur.

7. The Commission requests the five mutual water companies that have not responded to date – Vista Grande, Shallow Beach, Drakes Landing, Duck Cove, and Hamilton – comply with AB 54 and file their service information with LAFCO without further prompting or action by the membership.

8. The Commission should consider directing staff to prepare an addendum to this study with participation from area landowners to evaluate local needs and priorities within Dillon Beach and Nicasio with respect to possible governance and related options under LAFCO law involving water services.

9. BCPUD should prepare an update on the status of the agency's moratorium on new water service connections and efforts therein to address the underlying constraints to help – among other items – inform the County of Marin's ability to effectuate planning policies in the area proceeding ahead. BCPUD has responded it will prepare an update by December 31, 2016.

10. MBCSD should engage an outside consultant to prepare audits of the agency's financial statements to attest and, if applicable, identify improvements in the District's fiduciary duty to manage and record its finances consistent with governmental accounting standards.

11. The Commission should incorporate into its pending sphere of influence updates for the affected agencies the policy items marked in this study and include consideration of expansions to account for standing extraterritorial service contracts belonging to MBCSD and NMWD.

12. NMWD and the Commission should collaborate with community members on a potential boundary change to detach approximately 7,700 acres of unincorporated land from the District that includes North Inverness, Tomales Bay, and Marshall. This should include consideration of special legislation to expedite the boundary change and avoid the costs and uncertainties tied holding protest proceedings.

13. The Commission should consider directing staff to prepare an addendum to this study with agency participation to assess the viability of any service and cost efficiencies tied to consolidating MMWD and NMWD. The central objective of the addendum would be to inform the membership, agencies, and general public with respect to the merits/demerits of a potential consolidation and to justify any subsequent actions, including maintaining the status quo.

14. Looking ahead to future studies the Commission should explore and discus the potential to establish community wastewater systems with MBCSD, IPUD, SBCWD, and NMWD (Point Reyes Station) given the increasing cost and environmental considerations tied to maintaining septic systems in these areas.

15. Given its mandate and existing deficit therein the Commission should devote resources to develop institutional knowledge about the specific impacts on climate changes as it relates to, and among other areas, community water resources using best available science and incorporate into future studies.

2.3 WRITTEN DETERMINATIONS

The Commission is directed to prepare written determinations to address the multiple governance factors enumerated under G.C. Section 56430 anytime it prepares a municipal service review. These determinations are similar to findings and serve as independent statements based on information collected, analyzed, and presented in this study's subsequent sections. The underlying intent of the determinations is to provide a succinct detailing of all pertinent issues relating to the planning, delivery, and funding of public water services as it relates to the Commission's role and responsibilities. An abridged version of these determinations will be separately prepared for Commission consideration and adoption with the final report.

These determinations detail the pertinent issues relating to the planning, delivery, and funding of public water services relative to the Commission's interests. Determinations based on data collected and analyzed between 2009 and 2013.

A. Growth and Population Projections

Regional

1. The Commission estimates there are 256,230 total residents directly served by the six agencies' potable water systems as of the term of the study period. It is also estimated the combined service population has modestly increased by 992 or 0.38% over the prior five-year review period.

2. The Commission estimates overall resident growth in the five service areas in West Marin has increased by 1.0% over the study period and is more than two times greater than the 0.4% growth rate in the two East Marin service areas.

3. It is projected by the Commission residential growth trends over the study period will largely continue over the succeeding 10-year period and produce a modest overall annual resident change of 0.08% and add 2,002 new persons by 2023 within the six affected agencies' seven service areas.

4. A significant distinction exists between West and East Marin involving residency type with part-time or non-owner residents making up more than 50% of the combined population within the former's five service areas compared to 20% in the latter's two service areas. This distinction helps to explain why average peak-demands in West Marin are nearly 25% greater in intensity to East Marin during the study period.

5. It is anticipated by the Commission for planning purposes a total of 8,810 new housing units – producing a projected 28,728 additional residents – will eventually be constructed within the six affected agencies' seven service areas at buildout based on current land use policies.

6. Current demographic information shows marked differences between East and West Marin with increasing challenges for the latter residents' ability to fund water operations and improvements in the long-run given relative advanced age, low household incomes, and higher poverty rates.

7. Totaled assessed value for the six affected agencies' jurisdictional lands equals $41.7 billion and represents 70% of the countywide valuation total.

8. Population density ratios range from a low of 196 residents for every square mile in SBCWD to a high of 1,255 residents for every square mile in MMWD as of the term of the study period.

9. The Commission estimates BCPUD is at 89% of the service area's current buildout population with 1,574 residents served by the District's potable water system as of the term of the study period. It is reasonable to assume BCPUD's resident population will remain stagnant through 2023 given the existing moratorium on new water service connections. Related statements follow.

    a) BCPUD' fulltime residents are generally at an economic disadvantage compared to countywide averages based on median household income and poverty rate discrepancies. The rate of these discrepancies is also escalating and marked by a significant one-half increase in the number of persons living under the poverty rate over the study period.

10. The Commission estimates IPUD is at 87% of the service area's current buildout projection with 1,375 residents served by the District's potable water system as of the term of the study period. It is reasonable to assume the annual growth rate will match the study period with an overall yearly change of 0.12% and lead to an increase of 17 to 1,391 by 2023. Related statements follow.

    a) IPUD's fulltime residents are significantly older – and getting older – compared to countywide averages. Residents have also experienced a notable decline in economic standing with close to a one-fourth decrease in the median household income along poverty rates doubling over the study period.

11. The Commission estimates MBCSD is at 94% of the service area's current buildout projection with 431 residents served by the District's potable water system as of term of the study period. It is reasonable to assume the growth rate will match the study period with an overall yearly change of 0.40% and lead to an increase of 19 to 448 by 2023. Related statements follow.

    a) MBCSD's fulltime residents are generally more affluent, homogeneous, and formally educated compared to countywide averages despite similar ages. Further, the rate of the community's affluence is escalating with the median household income having increased by two-thirds over the study period and now standing nearly double the countywide average.

12. The Commission estimates SBCWD is at 92% of the service area's current buildout projection with 1,957 residents served by the District's potable water system as of the term of the study period. It is reasonable to assume the annual growth rate in will match the study period with an overall yearly change of 0.14% and lead to an increase of 28 to 1,985 by 2023. Related statements follow.

Agencies

a) SBCWD's fulltime residents are becoming increasingly older and more homogenous relative to countywide averages. SBCWD's residents have also experienced a sharp decline in economic standing over the study period with median houseline income declining by over one-fourth.

13. The Commission estimates MMWD is at 89% of the service area's current buildout projection with 186,048 residents served by the District's potable water system as of the term of the study period. It is reasonable to assume the growth rate within MMWD will match the study period with an overall yearly change of 0.07% and lead to an increase of 2,038 to 187,399 by 2023. Related statements follow.

    a) MMWD's fulltime constituents are aligned with countywide averages with respect to social and economic indicators with the two statistical significant exceptions: District customers have increasingly higher median household incomes and more formal education. A growing economic disparity has also emerged in which overall median incomes have generally remained stagnant while unemployment levels have increased by nearly one-half.

14. The Commission estimates NMWD is at 94% of the service areas' current buildout projection with 64,845 total residents served by the District's two potable water systems as of the term of the study period. It is reasonable to assume the growth rates within NMWD and for its two service areas – Novato and Point Reyes Station – will match the study period with an overall yearly change of 0.08% and lead to an increase of 587 to 65,432 by 2023. Related statements follow.

    a) NMWD's fulltime residents served by the Novato system are generally statistically aligned with countywide averages with respect to social and economic indicators with the notable exceptions of lower median household incomes and higher unemployment levels.

B. Location and Characteristics of Disadvantaged Unincorporated Communities

Regional

1. Two unincorporated communities in Marin County presently qualify as disadvantaged under the statewide definition based on recent census information: Alto and Marin City. Both communities – whose median incomes fall below 80% of the statewide average and therefore qualify as disadvantaged under the statewide definition – are located in southern Marin County and lie in MMWD with an estimated joint population of 20,680 with over 90% in Marin City.

Regional

2. A third unincorporated community – Nicasio in central Marin County – previously qualified as disadvantaged under the statewide definition before slightly exceeding the median household income threshold in the latest census. This community and its estimated population of 100 lies outside of any public water system's sphere of influence and dependent on private groundwater sources.

3. It is reasonable to assume other unincorporated communities in Marin County would qualify as "disadvantaged" upon completion of the Commission's scheduled policy review to establish its own definition as provided under Senate Bill 244 in 2011. The Commission should proactively work with other local agencies – and in particular water, sewer, and fire providers – in developing a definition to meet the legislation's intent to ensure an appropriate and equitable level of municipal services is available for the affected areas.

C. Capacity of Public Facilities and Infrastructure Needs and Deficiencies

Regional

1. The Commission estimates the total combined maximum annual water supply available to the six affected agencies under normal conditions is 119,080 acre-feet. The average and combined annual water demand over the study period among all six affected agencies equals 31% of the estimated maximum supply.

2. All six affected agencies have positive annual demand-to-supply ratios under normal conditions based on five-year averages over the study period within their seven service areas ranging from a low of 15% for IPUD to a high of 76% for BCPUD. Minimal changes to these ratios are expected through 2023.

3. The Commission estimates the total combined maximum annual water supply available to the six affected agencies under single dry-year conditions is 37,758 acre-feet; a reduction of (68%) compared to normal conditions. The average and combined annual water demand over the study period among all six affected agencies equals 98% of the estimated maximum supply under single dry-year conditions.

4. Two of the six affected agencies – BCPUD and MMWD – have negative annual demand-to-supply ratios under projected single dry-year conditions based on annual averages within their service areas over the study period. Two additional agencies – MBCSD and NMWD (Novato) – are expected to reach supply capacity relative to annual demands by 2023.

5. Overall annual demands have increased for five of the seven service areas belonging to the six affected agencies during the study period. These agencies are BCPUD, IPUD, MBCSD, SBCWD, and NMWD (Novato).

Regional

6. Average daily water demand per resident in the two East Marin service areas during the study period has been 128 gallons. This amount is nearly double the average rate of 77 gallons within the five service areas in West Marin.

7. Demand trends over the study period show system intensity occurring for four of the five services areas in West Marin with all experiencing rises in per capita demands that exceed their estimated population change. These West Marin agencies are BCPUD, IPUD, MBCSD, and SBCWD.

8. The Commission projects an overall decrease in annual water demands among all six affected agencies of (3.4%) by 2023 based on study period trends; a net savings of (1,268) acre-feet over the baseline year and largely attributed to decreases within MMWD. This projection is also reflected in shared relative demand with combined per capita daily use decreasing from 131 to 126 gallons.

9. Irrespective of overall savings, annual demands are expected to increase for four of the seven service areas served by the six affected agencies by collectively 506 acre-feet or 5.0% based on study period trends and involve IPUD, MBCSD, SBCWD and NMWD (Novato). The remaining three service areas served by MMWD, BCPUD, and NMWD (Point Reyes) are expected to experience decrease demands collectively totaling (1,774) acre-feet or (6.4%).

10. The Commission projects the six affected agencies combined average per capita water allowance at current buildout under normal and single dry-year conditions is 373 and 118 gallons, respectively; a comparison difference of (68%).

11. Nearly all six affected agencies have adequate treatment capacity to accommodate peak-day demands within their service areas based on annual averages over the study period. The lone exception is BCPUD with a demand-to-supply ratio of 102% or (2%) during the study period. Two additional agencies – IPUD and SBCWD – are projected to approach their treatment capacity limits by 2023.

12. All six affected agencies have adequate storage capacity to accommodate peak-day demands within their service areas based on annual averages over the study period with excess capacity of no less than 50%. Minimal changes in these ratios are expected within the succeeding 10-year period.

Agencies

13. BCPUD's water infrastructure presently operates with available capacity in two of the three measured categories with surpluses in supply and storage based on production demands through the study period under normal conditions. Only treatment capacity has been at a deficit and specific to meeting peak-day demands. Projected single dry-year conditions generate additional and generally moderate infrastructure constraints now and going forward to 2023 and

highlighted by annual and peak-day demands exceeding supplies. Specific ratios follow.

a) BCPUD's potable supplies under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 69% of the District's accessible sources. This ratio changes under projected single dry-year conditions to 112% – or (12%) – under the baseline year and slightly lower to (10%) by 2023.

b) Annual demands in BCPUD over the study period increased by an equivalent of 2.3% each year and driven by a production spike in the last year of review. The Commission estimates annual demands over the next 10-year period will reverse and decrease by (1.0%) each year through 2023.

c) Average peak-day demands within BCPUD over the study period equals 66% of available daily supplies under normal conditions and rises to a (6%) deficit during projected single dry-year conditions.

d) BCPUD's average daily per capita demand over the study period has been 66 gallons. The projected maximum daily per capita supply allowance for BCPUD at current buildout of the service area under normal and single dry-year conditions is 84 and 52 gallons, respectively.

e) BCPUD's treatment facility is at 103% capacity in accommodating existing peak-day averages within the service area based on study period totals. This ratio deficit is expected to rise to 107% – or (7%) – by 2023.

f) BCPUD's storage facilities is at 27% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to rise to 28% by 2023.

g) The total number of days BCPUD's current storage facilities can accommodate the average peak-day demand generated during the study period is 3.7. This ratio is expected to slightly decrease to 3.6 days by 2023.

14. IPUD's water infrastructure operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under both normal conditions and projected single dry-year conditions. Limited and relatively moderate infrastructure constraints are projected going forward to 2023 and specific to dwindling treatment capacity to meet expected peak-day demands. Specific ratios follow.

a) IPUD's potable supplies under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 14% of the District's accessible sources. This ratio rises to 52% under projected single dry-year conditions under the baseline year and advances to 63% by 2023.

b) Annual demands in IPUD over the study period increased by an equivalent of 1.7% each year. The Commission estimates annual demands over the next 10-year period will decelerate by nearly two-fold and increase by only 0.8% each year through 2023.

c) Average peak-day demands within IPUD over the study period equals 14% of available daily supplies under normal conditions and rises to 17% during projected single dry-year conditions.

d) IPUD's average daily per capita demand over the study period has been 45 gallons. The projected maximum daily per capita supply allowance for IPUD at current buildout of the service area under normal and single dry-year conditions is 297 and 77 gallons, respectively.

e) IPUD's treatment facility is at 70% capacity in accommodating existing peak-day averages with the service area based on study period totals. This percentage is expected to reach near capacity at 87% by 2023.

f) IPUD's storage facilities is at 29% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to rise to 35% by 2023.

g) The total number of days IPUD's current storage facilities can accommodate the average peak-day demand generated during the study period is 3.5. This ratio is expected to decrease to 2.8 days by 2023.

15. MBCSD's water infrastructure operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under normal conditions. Moderate to significant infrastructure constraints are projected under single dry-year conditions now and going forward to 2023 and specific to demands nearing and exceeding, respectively, annual and peak-day water supplies. Specific ratios follow.

a) MBCSD's potable supplies under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 56% of the District's accessible sources. This ratio changes under projected single dry-year conditions to 86% and advances to near capacity at 94% by 2023.

b) Annual demands in MBCSD over the study period increased by an equivalent of 1.8% each year. The Commission estimates annual demands over the next 10-year period will slightly decelerate to 1.0% through 2023.

c) Average peak-day demands within MBCSD equals 83% of available daily supplies under normal conditions and rises to 314% – or a (214%) deficit – during projected single dry-year conditions.

d) MBCSD's average daily per capita demand over the study period has been 53 gallons. The projected maximum daily per capita supply allowance for MBCSD at current buildout of the service area under normal and single dry-year conditions is 98 and 61 gallons, respectively.

e) MBCSD's treatment facility is at 26% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to modestly rise and reach 31% by 2023.

f) MBCSD's storage facilities are at 8% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to modestly rise to 10% by 2023.

g) The total number of days MBCSD's current storage facilities can accommodate the average peak-day demand generated during the study period is 11.9. This ratio is expected to slightly decrease to 10.2 days by 2023.

16. SBCWD's water infrastructure operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under normal conditions. Relatively modest infrastructure constraints are projected under single dry-year conditions now and going forward to 2023 and specific to peak-day demands exceeding supplies along with approaching treatment capacities. Specific ratios follow.

    a) SBCWD's potable supplies under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 13% of the District's accessible sources. This ratio changes under projected single dry-year conditions to 55% under the baseline year and advances to 76% by 2023.

b) Annual demands in SBCWD over the study period increased by an equivalent of 1.9% each year. The Commission estimates annual demands during the next 10-year period will intensify and increase by 3.3% through 2023.

c) Average peak-day demands within SBCWD over the study period equals 22% of available daily supplies under normal conditions and rises sharply to near capacity at 91% during projected single dry-year conditions; the latter of amount reaching an expected deficit of (27%) by 2023.

d) SBCWD's average daily per capita demand over the study period has been 75 gallons. The projected maximum daily per capita supply allowance at current buildout of the service area under normal and single dry-year conditions is 531 and 125 gallons, respectively.

e) SBCWD's treatment facility is at 63% capacity in accommodating existing peak-day averages within the service area based on study period totals. This percentage is expected to near capacity and reach 87% by 2023.

f) SBCWD's storage facilities are at 21% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to rise to 29% by 2023.

g) The total number of days SBCWD's current storage facilities can accommodate the average peak-day demand generated during the study period is 4.9. This ratio is expected to slightly decrease to 3.5 days by 2023.

17. MMWD's water infrastructure operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under normal conditions. Minimal to moderate infrastructure constraints are projected under single dry-year conditions now and going forward to 2023 and highlighted by annual and peak-day demands exceeding available water supplies. Specific ratios follow.

a) MMWD's potable supplies under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 28% of the District's accessible sources. This ratio changes under projected single dry-year conditions to a deficit of (1%) under the baseline year and settles back slightly to near capacity at 98% by 2023.

b) Annual demands in MMWD over the study period decreased by an equivalent of (0.3%) each year. The Commission estimates annual demands during the next 10-year period will further de-intensify at (0.6%) each year through 2023.

c) Average peak-day demands within MMWD over the study period equals 48% of available daily supplies under normal conditions and rises sharply to a deficit of (59%) during projected single dry-year conditions.

d) MMWD's average daily per capita demand over the study period has been 127 gallons. The projected maximum daily per capita supply allowance at current buildout of the service area under normal and single dry-year conditions is 199 and 111 gallons, respectively.

e) MMWD's treatment facilities is at 61% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to slightly decrease to 59% by 2023.

f) MMWD's storage facilities are at 44% capacity in accommodating existing peak-day averages within the service area based on study period totals. This capacity demand is expected to decrease to 42% by 2023.

g) Irrespective of the preceding comment, storage improvements are needed in Ross Valley to improve holdings to accommodate this pressure zone's existing and projected peak-day demands.

h) The total number of days MMWD's current storage facilities can accommodate the average peak-day demand generated during the study period is 2.3. This ratio is expected to slightly increase to 2.4 days by 2023.

18. NMWD's water infrastructure for the Novato system operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under normal conditions. Modest to moderate infrastructure constraints are projected under single dry-year conditions now and going forward to 2023 and highlighted by annual and peak-day demands approaching and exceeding, respectively, available supplies. Specific ratios follow.

    a) NMWD's potable supplies for the Novato system under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 41% of the District's accessible sources. This ratio changes under projected single dry-year conditions to 87% under the baseline year and advances to near capacity at 98% by 2023.

    b) Annual demands in the Novato system over the study period increased by an equivalent of 0.8% each year. The Commission estimates annual demands during the next 10-year period will de-intensify and increase by 0.4% each year through 2023.

c) Average peak-day demands within the Novato system over the study period equals 53% of available daily supplies under normal conditions and rises sharply to a (5%) deficit during projected single dry-year conditions.

d) NMWD's average daily per capita demand in the Novato system over the study period has been 130 gallons. The projected maximum daily per capita supply allowance at current buildout of the service area under normal and single dry-year conditions is 305 and 142 gallons, respectively.

e) NMWD's treatment facilities within the Novato system is at 57% capacity in accommodating existing peak-day averages within the service area based on study period totals. This percentage is expected to rise to 64% by 2023.

f) NMWD's storage facilities within the Novato system are at 42% capacity in accommodating existing peak-day averages within the service area based on study period totals. This percentage is expected to rise to 45% by 2023.

g) The total number of days NMWD's current storage facilities within the Novato system can accommodate the average peak-day demand generated during the study period is 2.4. This ratio is expected to decrease to 2.1 days by 2023.

19. NMWD's water infrastructure for the Point Reyes Station system operates with available capacity in all three measured categories – supply, storage, and treatment – based on production demands through the study period under both normal conditions and projected single dry-year conditions. Limited and modest infrastructure constraints are projected going forward to 2023 and specific to dwindling storage to meet expected peak-day demands. Specific ratios follow.

a) NMWD's potable supplies for the Point Reyes Station under normal conditions operate with available capacity given average annual demands within the service area over the study period equals 39% of the District's accessible sources. This ratio changes under projected single dry-year conditions to 45% under the baseline year and slightly less to 44% by 2023.

b) Annual demands in the Point Reyes Station's system over the study period decreased by an equivalent of (3.1%) each year. The Commission estimates annual demands during the next 10-year period will continue to decrease – albeit at a lesser intensity – at (0.2%) each year through 2023.

c) Average peak-day demands within the Point Reyes Station over the study period equals 78% of available daily supplies under normal conditions and holds therein during projected single dry-year conditions.

Agencies

d) NMWD's average daily per capita demand within Point Reyes Station over the study period has been 118 gallons. The projected maximum daily per capita supply allowance at current buildout of the service area under normal and single dry-year conditions is 178 and 153 gallons, respectively.

e) MWD's treatment facility for Point Reyes Station is at 68% capacity in accommodating existing peak-day averages within the service area based on study period totals. This percentage is expected to slightly adjust downward to 67% by 2023.

f) NMWD's storage facilities for Point Reyes Station are at 45% capacity in accommodating existing peak-day averages within the service area based on study period totals. This percentage is expected to generally hold through 2023.

g) The total number of days NMWD's current storage facilities within Point Reyes Station can accommodate the average peak-day demand generated during the study period is 2.2. This ratio is expected to hold through 2023.

D. Agencies' Financial Ability to Provide Services

Regional

1. All six affected agencies experienced moderate to significant gains in their overall financial standing as measured by total net assets or equity during the study period. The collective increase in the agencies combined net assets totaled $35.4 million and represents a difference of 9.6%.

2. All six affected agencies finished the study period in generally good position with respect to liquidity and profitability with all finishing with current ratios of no less than 4 to 1 and operating margins that exceed corresponding changes in inflation. Three of the agencies – SCBWD, MMWD, and NMWD – however finished with relatively high debt ratios that approach 50% of their respective net assets.

3. Five of the six affected agencies – BCPUD, IPUD, SBCWD, MMWD, and NMWD – have existing pension obligations through separate contracts with CalPERS. These contracts include mandatory contributions based on annual actuarial reports prepared by CalPERS with the corresponding rates collectively increasing over the most recent five year period (2010-15) by an approximate 20% average.

4. The combined active-to-retiree ratio between the five subject agencies is 0.79 to 1.00; an amount meaning there are approximately four active employees contributing to the pension system for every five retired employees.

Regional

5. Four of the five subject agencies – BCPUD, IPUD, SBCWD, and NMWD – with pension have experienced no less than a 13.5% increase in the actual pension costs over the last three available years of documentation (2011-13); a change nearly three times greater than the corresponding inflation rate for the region.

6. Only BCPUD has a funded status above 80% as of the last report issuance by CalPERS; the standard threshold used in governmental accounting to identify relatively stable pension plans.

7. The current average residential cost for potable water service weighted among all seven service areas is $0.78 for every 100 gallons, and translates to an annual cost of $1,175 based on consumption rates over the study period.

Agencies

8. BCPUD has maintained positive year-end operating balances in four of the five years reviewed in the study period with an average net of 25% of revenues over expenses. Trends also are positive with the growth rate of revenues exceeding the growth rate in expenses by more than threefold. Related statements follow.

   a) BCPUD's liquidity is good with current assets outpacing current liabilities at the close of the study period by 3 to 1.

   b) BCPUD's capital is good with low long-term debts equaling only 18% of total net assets at the close of the study period.

   c) BCPUD finished the study period with one of the highest unrestricted fund balances relative to service population with a per capita amount of $1,037.

   d) BCPUD's pension obligations is in relatively good shape with a funded ratio (market) at the end of the study period of 81.4%; the highest and best ratio among the five subject agencies.

9. IPUD has maintained positive year-end operating balances in all five years of the study period with an average net of 18% of revenues over expenses. Trends also are positive with the growth rate of revenues exceeding the growth rate in expenses by more than two-fold. Related statements follow.

   a) IPUD's liquidity is extremely high with current assets outpacing current liabilities at the close of the study period by 227 to 1.

   b) IPUD's capital is good with very low long-term debts equaling only 3% of total net assets at the close of the study period.

   c) IPUD finished the study period with a relatively low unrestricted fund balance relative to service population with a per capita amount of $175.

d) ICPUD's pension obligations are modestly underfunded relative to accounting standards with a funded ratio (market) at the end of the study period of 75%; the second highest and best ratio among the agencies.

10. MBCSD has maintained positive year-end operating balances in all five years of the study period with an average net of 118% of revenues over expenses. Trends also are positive with the growth rate of revenues exceeding the growth rate in expenses by more than one-tenth. Related statements follow.

    a) MBCSD's liquidity is relatively high with current assets outpacing current liabilities at the close of the study period by 37 to 1.

    b) MBCSD's capital is untouched with no long-term debts booked at the close of the study period.

    c) MBCSD finished the study period with a relatively high unrestricted fund balance relative to service population with a per capita amount of $1,761; the highest ratio among the agencies.

    d) MBCSD has no pension obligations.

11. SBCWD has maintained positive year-end operating balances in all five years of the study period with an average net of 15% of revenues over expenses. Trends during this period, however, are narrowing with the growth rate of revenues falling short of the growth rate of expenses by one-tenth. Related statements follow.

    a) SBCWD's liquidity is good with current assets outpacing current liabilities at the close of the study period by 5 to 1.

    b) SBCWD's capital is marginal with long-term debts equaling 46% of total net assets at the close of the study period.

    c) SBCWD finished the study period with a relatively moderate unrestricted fund balance relative to service population with a per capita amount of $679.

    d) SBCWD's pension obligations are moderately underfunded relative to accounting standards with a funded ratio (market) at the end of the study period of 67%; the lowest ratio among the agencies.

Agencies

12. MMWD has maintained positive year-end operating balances in all five years of the study period with an average net of 8% of revenues over expenses. Trends during this period are also positive with the growth rate of revenues exceeding the growth rate of expenses by over three-fold. Related statements follow.

    a) MMWD's liquidity is good with current assets outpacing current liabilities at the close of the study period by 5 to 1.

    b) MMWD's capital is marginal with long-term debts equaling 43% of total net assets at the close of the study period.

    c) MMWD finished the study period with a relatively modest unrestricted fund balance relative to service population with a per capita amount of $209.

    d) MMWD's pension obligations are moderately underfunded relative to accounting standards with a funded ratio (market) at the end of the study period of 68%; the second lowest ratio among the agencies.

13. NMWD has experienced negative year-end operating balances in four of the fives of the study period with an average net loss of (19%) of revenues over expenses. Trends during this period, however, are improving with the growth rate of revenues exceeding the growth rate of expenses by two-fifths. Related statements follow.

14. NMWD's liquidity is good with current assets outpacing current liabilities at the close of the study period by 4 to 1.

    a) NMWD's capital is marginal with long-term debts equaling 45% of total net assets at the close of the study period.

    b) NMWD finished the study period with a relatively modest unrestricted fund balance relative to service population with a per capita amount of $202.

    c) NMWD's pension obligations are moderately underfunded relative to accounting standards with a funded ratio (market) at the end of the study period of 72%.

E. Status and Opportunities for Shared Facilities and Resources

Regional

1. The five agencies serving West Marin have developed an informal network to communicate current and pending activities within their respective service areas and share best practices that ultimately benefit their constituents.

Regional

2. The Commission recommends the West Marin agencies jointly invest resources to prepare a water reliability report assessing each system's available supplies under different hydrologic periods based on shared planning assumptions.

3. MMWD and NMWD have effectively partnered with other local agencies in jointly funding and establishing regional recycled water programs as part of the North Bay Water Reuse Authority. This joint-powers provides a mechanism for MMWD and NMWD to pool resources in securing competitive governmental subventions to implement and expand recycled water services in their service areas to help offset potable demands and have generated a combined average savings over the five-year review period of 836 acre-feet.

4. Near-term opportunities for West Marin agencies to partner and/or develop their own recycled water services to offset potable demands is minimal given the lack of current community wastewater collection systems.

5. All six affected agencies have their own procurement processes with respect to purchasing supplies and materials in support of providing potable water services within their respective service areas. More recently some of the agencies have also begun developing joint-procurement activities with other agencies. The Commission encourages the continued pursuant of these cooperative relationships and the efficiencies and cost-savings they produce.

F. Local Accountability and Government Restructure Options

Regional

1. All six affected agencies and their constituents benefit from employing capable and dedicated management that appear to effectively administer day-to-day activities consistent with governing directives and community needs.

2. The general managers and staff for the six affected agencies have shown timely leadership by proactively engaging their boards and constituents on the ongoing status of their water systems in response to the current statewide drought. This includes partnering together in various cross-community forms to discuss and educate the public on the challenges and opportunities tied to the drought and promotion therein of more sustainable land/water use relationships.

3. Relative to conservation efforts there is noticeable silence among the majority of the six affected agencies with respect to adding potable supplies to meet future system demands despite most having deficits under single dry-year conditions. While the Commission recognizes conservation is the best and most efficient tool to manage demands it is equally important to consider supplies and enhancement opportunities given its perennial need, value, and – based on history – escalating costs. The Commission, accordingly, recommends the

Regional

agencies consider supply enhancements in line with ongoing conservation programs going forward to remain fully accountable to future constituents given new growth will occur.

4. As of date only 6 of the 12 identified mutual water companies in Marin County have provided the Commission with service information – including boundary maps – as required under Assembly Bill 54 (2012). The Commission requests the four mutual water companies that have not responded to date – Vista Grande, Shallow Beach, Drakes Landing, Duck Cove, and Hamilton – comply with this legislative requirement without further prompting.

5. Information collected to date suggest there may be merit for the Commission to explore public water service options for two unincorporated communities: Dillon Beach and Nicasio. Both areas are presently dependent on a combination of mutual water companies and/or private groundwater sources that are generating increasing questions regarding availability and quality. If agreeable the County should direct staff to prepare an informational report with participation from area landowners on these communities' governance and related options therein under LAFCO law for future discussion and possible action.

Agencies

6. BCPUD has maintained an emergency moratorium on new water service connections since 1971 due to concerns over supply deficiencies that as a consequence has effectively stalled community planning in the area. It would be prudent for BCPUD to prepare an update on the status of the moratorium and efforts to address the underlying constraints in order – among other factors – to help clarify the ability of the County of Marin to effectuate its adopted planning policies within the community proceeding ahead.

7. MBCSD should engage an outside consultant to prepare audits of the agency's financial statements to attest and, if applicable, identify improvements in the District's fiduciary duty to effectively manage its resources consistent with governmental accounting standards.

8. In step with a future sphere of influence update for MBCSD it would be appropriate for the Commission to consider the merits/demerits of expanding the designation to include existing outside service connections located in Frank Valley along Muir Woods Road.

9. A cursory review of reorganization options indicates a more detailed review is appropriate to more clearly assess the merits of a consolidation between MMWD and NMWD with respect to syncing water services along the 101 corridor. If agreeable the Commission should direct staff with agency participation to prepare an informational report assessing the viability of any service and cost efficiencies

Agencies

tied to consolidation with the central objective of informing the membership, agencies, and the public of options – including justification for the baseline.

10. In step with a future sphere of influence update for NMWD it would be appropriate for the Commission to consider all of the following.

    a) NMWD's existing jurisdictional boundary entirely overlaps the jurisdictional boundary of IPUD. This overlap merits correction and the Commission should work with the affected agencies to expedite an appropriate adjustment to both the spheres and boundaries as the membership deems appropriate.

    b) NMWD's potable water services in the Point Reyes Station system extends beyond the agency's sphere and jurisdictional boundary and provides services to several commercial agricultural properties. The Commission should consider the merits/demerits of expanding the sphere and possible annexation of these outside lands to memorize NMWD's existing commitments and provide long-term assurances to the landowners of service availability to support the viability of agricultural production going forward.

    c) NMWD's existing sphere excludes a portion of the District jurisdictional boundary comprising the unincorporated communities of Tomales Bay and Marshall. NMWD provides no services within these lands and has stated there are no plans in the future to initiate any services. Accordingly, it would be appropriate for the Commission to work with NMWD and area landowners to facilitate detachment with the additional consideration of pursuing special legislation to mitigate against the costs and uncertainties tied to going through regular protest proceedings.

    d) NMWD's potable water services extends beyond the sphere of influence and into Sonoma County byway of both earlier annexations and outside service contracts. This Commission should consider the merits/demerits of expanding the sphere to recognize these existing service commitments in consultation with Sonoma LAFCO.

H. Matters of Local Interests as Required by Policy / Relationship Between Services and Land Use Policies

Regional

1. Looking ahead the Commission should explore and discuss the potential to establish community wastewater systems with MBCSD, IPUD, SBCWD, and NMWD (Point Reyes Station) given the dynamic of existing and planned development in these low-lying areas coupled with the increasing cost and environmental considerations tied to maintaining septic systems.

Regional

2. Given its mandate and existing deficit therein the Commission should devote resources to develop institutional knowledge about the specific impacts on climate changes as it relates to, and among other areas, community water resources using best available science and incorporate into future studies.

CHAPTER THREE
SERVICE CHARACTERISTICS

3.1 SERVICE AREAS

A. Population Trends

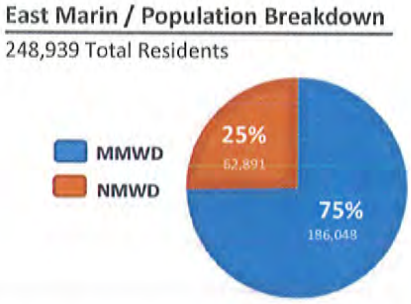
The resident population collectively served by the six existing affected public agencies responsible for providing potable water in Marin County is estimated by the Commission at 256,230 as of the term of this study period (2013).[20] This estimate is specific to residents directly tied to the potable water systems and disproportionately divided between East and West Marin with 97% - or 248,939 - residing in the former and specifically within MMWD and NMWD-Novato. It is also estimated the six affected agencies are collectively at 90% of their projected and combined buildout total of 284,958 in their present jurisdictional boundaries based on the current policies of the 12 land use authorities; policies that collectively contemplate up to 8,810 new units *may* be eventually built within their respective housing elements covering 2014-2022 (italics denotes variable in tied to market demand along with successful project approvals).

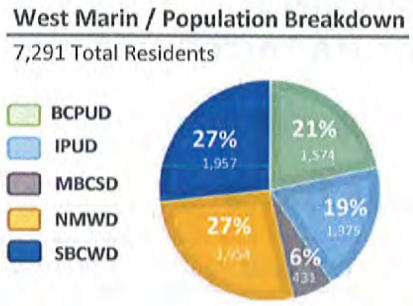
LAFCO estimates there are 256,230 total residents served by the six public agencies responsible for providing potable water service in Marin County as of the end of this study period. It is also estimated the combined service population has increased by 992 or 0.38% over the study period.

Estimated resident totals within all six affected agencies has increased by a combined 992 or 0.38% over study period. More than two-thirds of the estimated total – or 687 – has occurred within MMWD and close to one half tied to two subdivision projects: Ventana Villas in the City of San Rafael and Rose Garden in the City of Larkspur. However, and proportionally, most of the estimated new resident growth in the study period has occurred in West Marin's five service areas, which have collectively experienced a 1.0% overall increase despite one agency – BCPUD – having a standing moratorium on new service connections. This proportional increase in West Marin has been driven by close to 2.0% overall increases in both MBCSD and NMWD-Point Reyes Station.

Overall resident growth in the five service areas in West Marin has increased by 1.0% over the study period and is more than two times greater than the 0.4% growth rate in the two East Marin service areas.

[20] The estimated total resident service population of 256,230 as of the term of this study period has been independently calculated by the Commission. The projection largely draws on a hybrid calculation provided under California Code of Regulations specific to community water systems and based on multiplying the total number of active residential connections by either a factor of 2.8 for the five West Marin systems or 3.3 for the two East Marin systems. The calculation also includes a flat assignment of 4,000 residents for the San Quentin State Prison.





With respect to projections going forward, and for purposes of this study, it is assumed the resident growth rate within all six affected agencies will generally match the five year study period (2009-2013). This assumption produces an overall and projected annual change of less than one-tenth of a percent or 0.08% in resident growth over the succeeding 10-year period. The substantive result of this assumption would be an overall increase in the combined resident service population of 2,002 and produce a total of 258,232 by 2023. It also indicates – and if this growth rate holds thereafter – the current and combined projected buildout population of 284,958 at this time would be reached in 2153 with the annual additions ranging from 195 to 218 residents each year. (The term "buildout" is specific to current land use policies with the corresponding projections being dynamic and will increase overtime in step with the State's directive for local agencies to plan and accommodate new housing opportunities.)

It is assumed recent residential growth trends will generally continue over the succeeding 10-year period and produce an overall annual resident change of 0.08% and add 2,002 new persons by 2023.

LAFCO Resident Population Projections / Region
Table 3-1 (Marin LAFCO)

Category	2009	2013 -Baseline-	2023	Annual Trend	Buildout Estimate	Buildout Breakdown
West Marin Agencies	7,220	7,291	7,417	0.17	9,226	3.24
East Marin Agencies	248,018	248,939	250,750	0.07	275,732	96.76
Totals	**255,238**	**256,230**	**258,168**	**0.08%**	**284,958**	**100.0%**

LAFCO Resident Population Projections / Agencies
Table 3-2 (Marin LAFCO)

	Agency	2009	2013 -Baseline-	2023	Annual Trend	Buildout Estimate	Buildout Year
West Marin	BCPUD	1,574	1,574	1,574	0.00	1,784	n/a
	IPUD	1,366	1,375	1,392	0.12	1,582	2130
	MBCSD	422	431	450	0.43	459	2028
	SBCWD	1,943	1,957	1,985	0.14	2,125	2072
East Marin	MMWD	185,361	186,048	187,399	0.07	209,907	2180
	NMWD – Novato	62,657	62,891	63,396	0.08	65,825	2071
	NMWD – Point Reyes St.	1,915	1,954	2,036	0.41	3,276	2180
	Totals:	**255,238**	**256,230**	**258,232**	**0.08**	**284,958**	**2153**

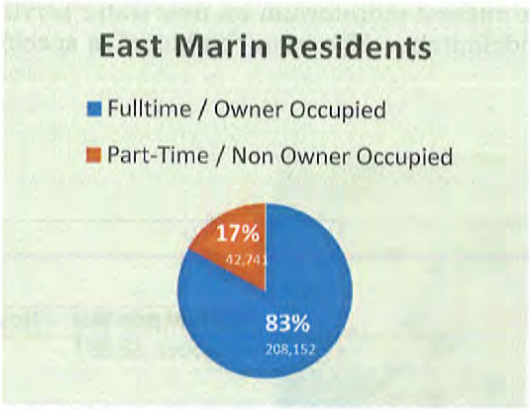
* It is assumed for purposes of this study the current moratorium on new water service connections within BCPUD will continue indefinitely. The term "buildout" is specific to current land use policies.

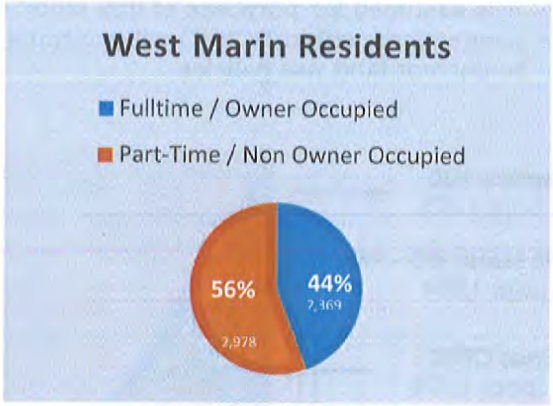


B. Residency Types

The Commission projects the estimated resident population total of 256,230 served by the six affected agencies as of the term end of this study period is divided between 210,521 residents that are either fulltime or owner-occupied and 45,719 residents that are either part-time or non-owner occupied. These projections produces an overall 82% to 18% split in favor of fulltime or owner-occupied residents that is considerably weighted by MMWD trends given it represents nearly three-fourths of all affected residents. A closer and proportional examination of individual agency estimates shows a distinct regional trend in which the split is significantly different in West Marin where fulltime or owner-occupied residents are collectively one-half lower at 44% compared to East Marin. This latter distinction is highlighted by the presumed prevalence of secondary residence uses in West Marin and highlighted by SBCWD where it is estimated that only 31% of residents are fulltime.

A significant distinction exists between West and East Marin with respect to residency type with part-time or non-owner residents making up more than 50% of the combined population within the former's five service areas (Muir Beach, Bolinas, Inverness, Stinson Beach, and Point Reyes Station). Comparatively, part-time or non-owner residents represents less than 20% of the population in East Marin.





Residency Type / Agency
Table 3-3 (Marin LAFCO)

Type	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD Novato	NMWD Pt. Reyes St.
Fulltime / Owner Occupied	59.4%	57.6%	69.5%	31.1%	**83.4%**	81.8%	45.0%
Part-Time / Non Owner Occupied	40.6%	42.4%	30.5%	**68.9%**	16.6%	18.2%	55.0%
	West Marin				East Marin		West Marin

C. Residential Trends

Future residential development will occur in Marin County – if for no other reasons – to meet the State's directive for all land use authorities to appropriately plan and accommodate housing for the current and future workforce.

Additional residential development – albeit to different degrees – is planned within all six affected local agencies' service areas, and accordingly represents a significant impact on the availability of future supplies going forward. The central source for this future planning is largely tied to State law and its requirement for land use authorities (i.e., cities and counties) to include housing elements in their general plans that make adequate provision for existing and projected housing needs of all economic segments of the community. These underlying statutes were amended by Senate Bill 375 in 2008 to require – among other items – housing elements be revised and updated every eight years beginning in 2010 to address the State's new regional housing assignments. The intent of the housing element law is to create a market-based strategy for local land use authorities to facilitate opportunities to increase in the supply and affordability in housing; actual construction of additional housing is not required by the State.[21]

[21] A pertinent and related section of LAFCO law directs commissions to facilitate orderly growth and development that includes providing housing for persons and families of all incomes under Government Code Section 56001.

With the preceding comments in mind, and for purposes of telegraphing future buildout conditions as part of this study, the Commission believes it is reasonable to assume the potential development of 8,810 new housing units in the six affected agencies' existing jurisdictional boundaries. (There is no specific timetable for actual development of these future housing units; associated buildout years identified in this study are based solely on current growth trends.) This total amount – which equals 8.6% of the total number of existing units – of expected new residential development is based almost entirely on the housing elements of all 12 land use authorities in Marin County and specific to zoning assignments as it applies to the six affected agencies' jurisdictional boundaries.

> It is anticipated a total of 8,810 new housing units – producing a projected 28,728 additional residents – may be constructed within the six affected agencies' jurisdictions at buildout based on current land use policies.

With respect to impacts on individual agencies and their service areas, slightly more than 80% – or 7,230 – of the planned new housing units are expected to be constructed within MMWD with over three-fourths of this amount lying in the District's 10 cities/towns. The remaining 20% of new housing development is largely dedicated to NMWD's Novato system – 889 units – with the rest scattered relatively evenly among the five West Marin systems. The cumulative effect of the new housing would be the addition of 28,728 new residents; an increase of 11% over current population estimates.

Residential Trends / Agencies
Table 3-4 (Marin LAFCO)

Type	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD Novato	NMWD Pt Reyes St.	Total
Existing Units	650	616	157	223	76,411	22,384	1,847	102,288
New Units at Buildout	75	74	10	60	7,230	889	472	8,810
- New Units as %	11.5%	12.0%	6.4%	21.2%	9.5%	4.0%	25.6%	8.6%
Buildout Units:	**725**	**690**	**167**	**283**	**83,641**	**23,299**	**2,319**	**111,099**
	West Marin				**East Marin**		**West Marin**	

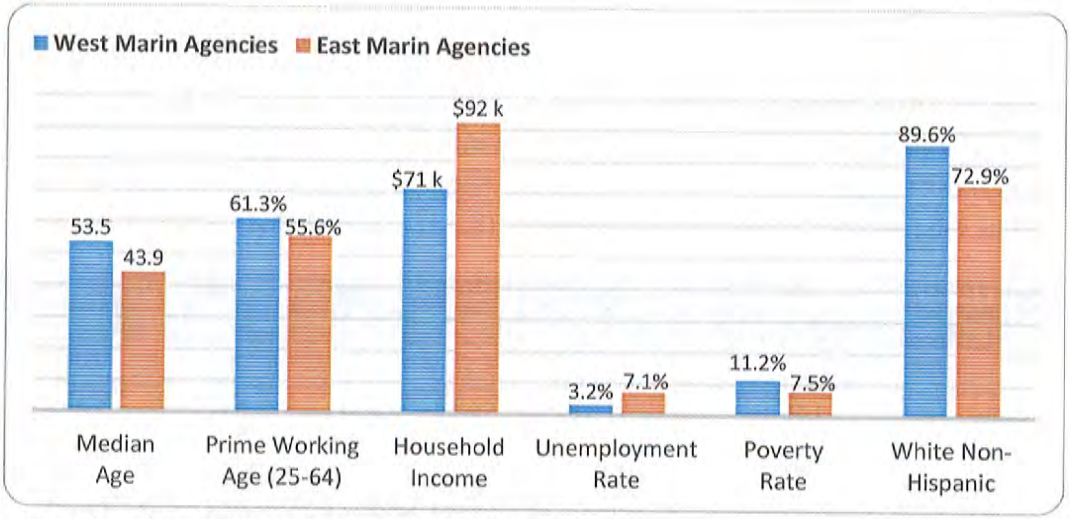
Notes to Table 3-4

1. The listing of residential units at buildout within each affected agency is based on a review of the applicable adopted housing elements of the 12 land use authorities in Marin County as of date. More detailed explanations are provided within the agency profiles prepared for each affected agency.

D. Demographics / Social and Economic Factors

A review of demographic information available for residents within the seven service areas of the six affected agencies identifies marked distinctions between West and East Marin.[22] This includes existing and increasing differences in economic and social factors that directly affect the ability and means for the residents/ratepayers to fund water systems, such as median age, household income, and income potential. Specifically, these differences collectively shows growing challenges for West Marin as illustrated below.

Current demographic information shows marked differences between East and West Marin with increasing challenges for the latter residents' ability to fund water operations and improvements in the long-run given relative advanced age, low household incomes, and higher poverty rates.



Social and Economic Characteristics / Region

Additional discussion on key regional and subregional social and economic distinctions follows along with an agency breakdown in the succeeding table.

- Graying in West Marin
  Residents in the five West Marin service areas are measurably older than their counterparts in the two East Marin service areas with a 22% separation in the median age totals of 53.5 and 43.9, respectively. This separation is also increasing with the median age rising by 6.9% over the prior five-year period in West Marin compared to only 0.7% in East Marin.

[22] Most recent census data reviewed as part of this study is for the 2013 calendar year.

- Widening Economic Gap Favoring East Marin
  Residents in the two East Marin service areas have 30% higher median household incomes at $92,833 compared to $71,028 in the five West Marin service areas. The disparity is also widening with household incomes in the East Marin service areas increasing by 3.4% over the prior five-year period while decreasing by (7.2%) in the West Marin service areas. Further, and paradoxically, this disparity exists despite the West Marin service areas having a lower unemployment rate and a higher percentage of residents within the prime workforce age (25 to 64) compared to the East Marin service areas.

- Quality of Life Differences
  Residents in the five West Marin service areas have collectively experienced nearly a one-half increase in poverty rates over the prior five-year period with the current total at 11.2% and is one-third higher than the two service areas in East Marin. There is also a difference in racial diversity between the two regions with West Marin being 86% white/non-hispanic compared to 73% in East Marin.

- Subregional Distinctions

  - A distinct economic division exists within West Marin as the two most southern agencies – MBCSD and SBCWD – generally serve affluent households relative to countywide averages with no to little unemployment or poverty. This contrasts with the three northern agencies – BCPUD, IPUD, and NMWD (Point Reyes Station) – in the region in which constituents' median household incomes fall significantly below countywide averages with higher and rising poverty.

  - A similar economic division exists in East Marin where MMWD residents have increasingly higher median household incomes as well as more formal education by one-fourth more compared to NMWD-Novato.

Social and Economic Characteristics / Agencies
Table 3-5 (Marin LAFCO / American Communities Survey)

	Category	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD Novato	NMWD Pt Reyes St.
Economic	Median Age	48.3	60.0	53.7	54.9	44.1	43.5	51.6
	Prime Working Age	76.9%	58.1%	87.4%	56.5%	55.4%	56.3%	50.0%
	Median HH Income	$54,635	$52,135	$169,063	$88,750	$97,400	$79,664	$58,258
	Unemployment Rate	7.4%	2.0%	0.0%	0.0%	6.9%	7.4%	4.6%
Social	Poverty Rate	26.7%	15.1%	0.0%	3.6%	7.6%	7.4%	6.1%
	4-Yr College Degree	27.2%	53.2%	82.1%	64.3%	59.3%	44.5%	54.1%
	White Non-Hispanic	86.6%	88.6%	94.2%	96.4%	73.7%	70.7%	71.1%
		West Marin				East Marin		West Marin

E. Jurisdictional Boundaries

The jurisdictional boundaries of the six affected agencies responsible for providing potable water services in Marin County collectively span 265.4 square miles and accounts for 51.1 % of the entire county boundary. MMWD is the single largest of the six agencies in terms of jurisdiction with 148 square miles and represents more than one-half of the combined six-agency total. Population density ratios range from a low of 196 residents for every square mile in SBCWD to a high of 1,255 residents for every square mile in MMWD as of the term of the study period. Totaled assessed value (land and structure) for all jurisdictional lands equals $41.7 billion and represents 70% of the current countywide property tax valuation.[23] (Amount excludes IPUD given it also lies in NMWD.)

Totaled assessed value for the six affected agencies' jurisdictional lands equals $41.7 billion and represents 70% of the countywide valuation total.

Jurisdictional Lands / Agencies
Table 3-6 (Marin LAFCO / MarinMap)

Category	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD
Total Square Miles	2.6	2.2	1.3	10.0	148.2	101.1
Density (Residents per Square Mile)	605.4	625.0	331.5	195.7	1,255.4	641.4
Total Assessor Parcels	1,168	755	187	941	66,387	23,236
Assessed Value (Land and Structure)	$278.4 m	$244.8 m	$121.4 m	$400.4 m	$29.8 b	$11.1 b
Assessed Value Per Resident	$0.176 m	$0.178 m	$0.276 m	$0.204 m	$0.160 m	$0.171 m
	West Marin				East Marin	

3.2 POTABLE WATER SYSTEMS

A. Supplies

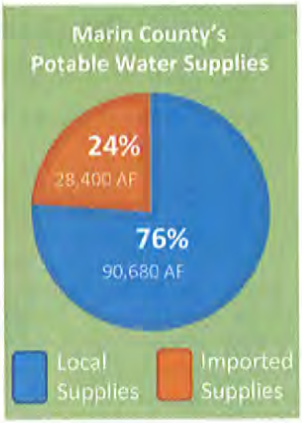
1.0 Overall / Maximum Conditions

The six affected agencies providing potable water collectively have established 17 distinct supply sources in serving their seven service areas and combined estimated resident service population of 256,230. The Commission estimates these 17 distinct supply sources – which are 99% tied to surface sources with the remaining 1% tied to groundwater – jointly provides the affected agencies with access up to a maximum annual amount of 38.8 billion gallons or 119,080 acre-feet with pumping and/or permit restrictions considered. This

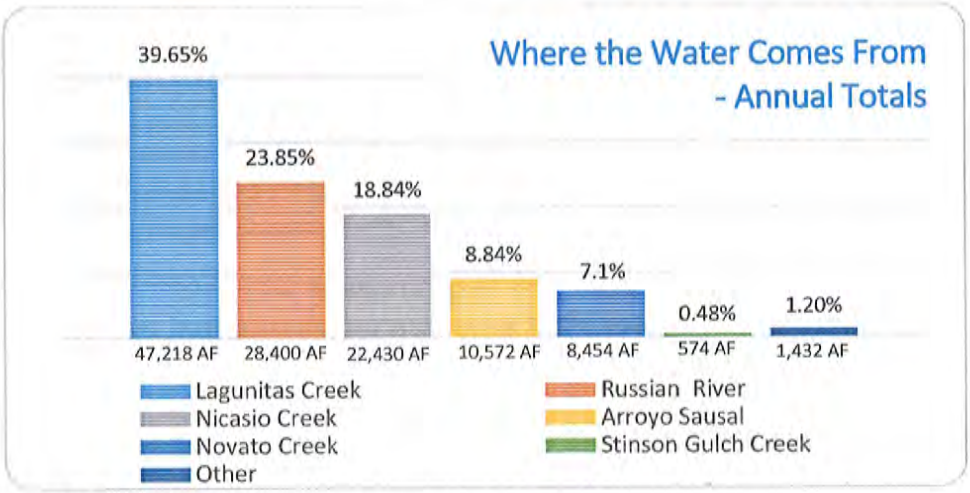
The Commission estimates the six affected public agencies collectively have access to a maximum annual amount of 119,080 acre-feet of potable water supplies. This total amount produces a maximum daily resident allowance of 415 gallons.

[23] The State Controller's Office reports Marin County's total secured assessed property tax valuation in 2013-2014 equaled $58.9 billion. (State Controller's Assessed Valuation Annual Report, 2013-2014)

maximum estimated amount produces a corresponding per capita use allowance of 415 gallons. Further, and of the total amount estimated to be available to the affected agencies, over three-fourths are drawn from local supplies originating in Marin County.



Almost two-thirds of the total estimated maximum potable supply available to the six affected agencies is tied to two sources: Lagunitas Creek and Russian River. Lagunitas Creek serves as the single largest potable source and is largely generated by direct runoff from Mount Tamalpais. Lagunitas Creek independently accounts for 39.7% of all available potable supplies and estimated to provide up to a maximum of 15.4 billion gallons or 47,218 acre-feet annually to MMWD and NMWD (Point Reyes Station). Russian River serves as the second largest potable source and accounts for 23.9% of all established supplies and primarily generated by runoff and creek diversions along its name-sake watershed that extends into Mendocino County. Russian River water is accessed by MMWD and NMWD-Novato through separate contracts and can jointly provide up to estimated 9.2 billion gallons or 28,400 acre-feet annually to the two agencies.



Top Potable Water Supply Sources in Marin County
amounts in acre-feet (af)

The six affected agencies' combined average yield of raw potable supplies accessed over the study period has been 12.1 billion gallons or 37,015 acre-feet. This combined total – which includes all diversions and/or pumping totals prior to treatment production – equals 31.1% of the total amount potentially available to the affected agencies under maximum/normal conditions.

The combined average annual yield taken by the six affected agencies prior to treatment production over the study period has been equal to 31.1% of the maximum yield jointly available to the agencies.

Individual agencies' high-year yields were spread out over the over the study period with a resulting combined total of 12.8 billion gallons or 39,467 acre-feet; an amount exceeding the average annual yield by 6.6%.



2.0 Agency Sources / Maximum Conditions

Bolinas Community Public Utility District

BCPUD's potable supplies are all generated from local surface sources with the majority drawn from the Arroyo Hondo Creek.[24] An unnamed stream provides supplemental supplies to as needed. It is estimated BCPUD's maximum annual available yield from all existing sources is estimated at 167 acre feet. BCPUD's average yield drawn over the study period has been 114.0 acre-feet. The single-highest year-end use occurred in 2013 when BCPUD collectively drew 127.3 acre-feet; an amount that exceeded the average annual take by more than 10%.[25]

BCPUD's maximum annual potable water supply yield is estimated by the Commission at 167.0 acre-feet. The average yield drawn over the study period has been 114.0 acre-feet.

Inverness Public Utility District

IPUD's potable water supplies are all locally sourced and drawn from multiple surface and groundwater sites with the principal sources being First, Second, and Third Valley Creeks.[26] It is estimated IPUD's maximum available yield from all of existing sources is 526 acre feet. IPUD's average yield drawn over the study period has been 73.42 acre-feet. The single-

IPUD's maximum annual potable water supply yield is estimated by the Commission at 526.2 acre-feet. The average yield drawn over the study period has been 73.4 acre-feet.

[24] BCPUD's potable water supplies are secured by multiple post 1914 appropriated permits rights with SWRCB.
[25] BCPUD notes the 2013 use was highly unusual and the result of extensive flushing needed as part of the installation of a major water main replacement project as well as several significant leaks on the distribution system; all of which the District reports were addressed by the end of 2013.
[26] IPUD's potable water supplies are primarily protected by pre 1914 appropriated rights with SWRCB.

highest year use over this period occurred in 2012 when IPUD collectively drew 75.8 acre-feet; an amount that exceeded the average annual take by close to one-twentieth.[27]

Muir Beach Community Services District

MBCSD's potable water supplies are all locally sourced and drawn from two separate groundwater sites accessing underflow from Redwood Creek.[28] It is estimated MBCSD's maximum annual available yield is 50.6 acre feet. MBCSD's average yield or take over the study period has been 26.48 acre-feet. The single-highest year-end use occurred in 2012 when MBCSD drew 28.87 acre-feet; an amount exceeding the average annual take by close to one-tenth.

MBCSD's maximum annual potable water supply yield is estimated by the Commission at 50.6 acre-feet. The average yield drawn over the study period has been 26.5 acre-feet.

Stinson Beach County Water District

SBCWD's potable supplies are locally sourced and drawn from both surface water and groundwater with Stinson Gulch Creek being the single principal source.[29] It is estimated SBCWD's maximum annual available yield from all existing sources is 1,262 acre-feet. The average yield drawn over study period has been 68.8 acre-feet. The single-highest year-end use occurred in 2011 when SBCWD collectively drew 74.0 acre-feet; an amount exceeding the average annual take by close to one-tenth.[30]

SBCWDs maximum annual potable water supply yield is estimated by the Commission at 1,262.0 acre-feet. The average yield drawn over the study period has been 68.8 acre-feet.

Marin Municipal Water District

MMWD's potable supplies are drawn from a combination of local and imported sources with the former generally accounting for three-fourths of annual uses and principally tied to Lagunitas Creek.[31] It is estimated MMWD's maximum annual available yield from all existing sources is 93,866 acre-feet. MMWD's average yield over the study period has been 26,521.4 acre-feet. The

MMWD's maximum annual potable water supply yield is estimated by the Commission at 93,866 acre-feet. The average yield drawn over the study period has been 26,521 acre-feet.

27 IPUD has also exercised its annual permit right over the same five year period to draw close one-quarter or 6.0 acre-feet of its allocation from its two lower elevation diversion points along First and Second Valley while groundwater extraction has been limited.

28 MBCSD's potable water supplies to underflow from Redwood Creek are secured through a post-1914 appropriated right permit with SWRCB.

29 SBCWD's potable water supplies are primarily protected by pre 1914 appropriated rights with SWRCB.

30 SBCWD has also pumped on average over the same period 21.877 million gallons or 67.1 acre-feet in groundwater from its four sites. Average groundwater use covers only 2012 through 2009.

31 MMWD's potable water supplies are primarily protected by pre 1914 appropriated rights with SWRCB as well as a contract with SCWA.

single-highest year-end use occurred in 2009 when MMWD collectively drew 27,807 acre-feet; an amount exceeding the average annual take by 5.0%.

North Marin Water District – Novato System

NMWD's potable water supplies for the Novato system are drawn from a combination of local and imported sources with the latter generally accounting for three-fourths of annual uses and tied to the Russian River.[32] It is estimated NMWD's maximum annual available yield from all existing sources for the Novato system is 22,554 acre-feet. The average yield drawn over the study period from all existing sources has been 9,917.7 acre-feet. The single-highest year-end use occurred in 2009 when NMWD collectively drew 10,921 acre-feet; an amount exceeding the average annual take by more than one-tenth.

NMWD's maximum annual potable water supply yield for the Novato system is estimated by the Commission at 22,554 acre-feet. The average yield drawn over the study period has been 9,918 acre-feet.

North Marin Water District – Point Reyes Station

NMWD's potable water supplies for the Point Reyes Station system are drawn entirely from direct surface and indirect groundwater flows from Lagunitas Creek.[33] It is estimated NMWD's maximum annual available yield from this source for the Point Reyes Station system is 654 acre-feet. The average yield drawn over the study period has been 293 acre-feet. The single-highest year-end use occurred in 2009 when NMWD collectively drew 432.7 acre-feet; an amount that exceeded the average five-year annual amount by more than two-thirds.

NMWD's maximum annual potable water supply yield for the Point Reyes Station system is estimated by the Commission at 654 acre-feet. The average yield drawn over the study period has been 293 acre-feet.

3.0 Overall Sources / Projected Drought Conditions

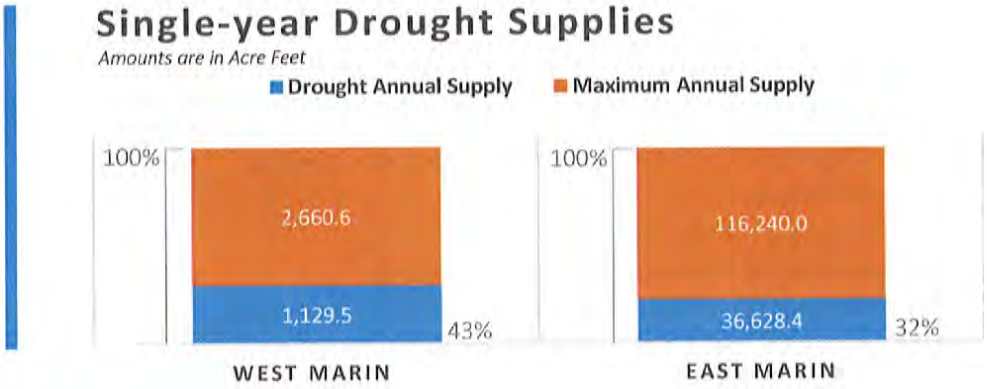
The Commission estimates an overall reduction of 68.3% in the maximum annual water supply collectively available to the six affected agencies and their seven service areas during single-dry year drought conditions. This projection – which reduces overall annual potable supplies from 119,080 to 37,756 acre-feet – incorporates regional reductions for East Marin and West Marin agencies of 68.5% and 57.6%, respectively, and produces a maximum per capita day allowance of 132

The Commission estimates the six affected public agencies will collectively experience a 68% decrease in available potable supplies during a significant dry-year drought consistent with the 1977 water year.

[32] NMWD's potable water supplies for the Novato system are secured by post 1914 appropriated permits with SWRCB as well as through a contract with SCWA.

[33] NMWD's potable water supplies for the Point Reyes Station system are secured by post 1914 appropriated permit rights with SWRCB.

gallons. The reductions are drawn from the Commission's own calculations performed for all five West Marin systems coupled with MMWD and NMWD's own projections for their systems in East Marin. Both calculations – those performed by the Commission and those performed by MMWD and NMWD – are based on using the 1977 water year as the baseline determinant in projecting drought totals.



4.0 Agency Sources / Drought Conditions

Bolinas Community Public Utility District

No formal analysis has been performed by BCPUD with respect to quantifying the District's potable water supply reliability during different hydrological periods. It appears reasonable, nevertheless, to assume some significant level of curtailment will occur during extended dry periods reducing the overall supply available to BCPUD for planning purposes. With this in mind, the Commission independently projects BCPUD's water supply being reduced up to 38% to align with a modification to the present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought.[34] The substantive effect of applying this single dry-year drought projection is BCPUD's annual water supply being reduced from its normal/maximum level of 167 acre-feet to 103.5 acre-feet; a net difference or loss of (63.5) acre-feet.

The Commission projects an overall decrease of BCPUD's annual potable supplies from 167 to 104 acre-feet during a significant single dry-year consistent with 1977 conditions. This projection represents a **38%** overall decrease in supplies relative to the maximum yield available to BCPUD.

[34] State Water Project Delivery Report (2013) estimates 1976-77 drought-like conditions reduces surface related supplies by 76% of normal/maximum. LAFCO has adjusted this curtailment to 38% on the rationale BCPUDs supplies are permitted and already incorporate a baseline reduction in total flows in Arroyo Hondo Creek and the unnamed streams.

Inverness Public Utility District

IPUD performed an assessment of its water supplies in 1982 following the year's earlier storm event and as part of a system needs evaluation. No update to this analysis has been performed to date. Accordingly, and for purposes of this planning document, it appears reasonable to assume some significant level of curtailment will occur during dry periods reducing the overall supply available to IPUD. With this in mind, the Commission independently projects IPUD's primary water supply sources and groundwater being curtailed up to 76% to match present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought. The remainder of IPUD's supply sources are also curtailed, though at a lesser extent – up to 38% – based on a modified calculation as described in the accompanying footnote.[35] The substantive effect of applying this drought curtailment projection is IPUD's annual water supply being reduced from its normal/maximum level of 526.2 acre feet to 135.98 acre-feet; a net difference or loss of (390.2) acre-feet.

The Commission projects an overall decrease of IPUD's annual potable supplies from 562 to 134 acre-feet during a significant single dry-year consistent with 1977 conditions. This projection represents a **76%** overall decrease in supplies relative to the maximum yield available to IPUD.

Muir Beach Community Services District

No formal analysis has been performed by MBCSD in recent years with respect to quantifying the District's water supply reliability during different hydrological periods. However, it appears reasonable to assume some significant level of curtailment will occur during extended dry periods reducing the overall supply available to MBCSD for planning purposes. With this in mind, the Commission independently projects MBCSD's water supply being reduced up to 38% to align with a modification to the present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought. The substantive effect of applying this drought projection is MBCSD's annual water supply being reduced from its normal/maximum level of 50.60 acre feet to 31.4 acre-feet; a net difference or loss of (19.2) acre-feet.

The Commission projects an overall decrease of MBCSD's annual potable supplies from 51 to 31 acre-feet during a significant single dry-year consistent with 1977 conditions. This projection represents a **38%** overall decrease in supplies relative to the maximum yield available to MBCSD.

[35] LAFCO has adjusted this curtailment upwardly to 38% for IPUD's permitted water supplies given these sources already incorporate a baseline reduction in total flows through a permit process managed by the State Water Resources Control Board.

Stinson Beach County Water District

SBCWD evaluated the reliability of its water supplies with the voluntary preparation of an Urban Water Management Plan (UWMP) in 2006 and orients the District to anticipate an overall reduction of more than one-half in its available supplies during single dry-year drought conditions and resulting in supplies decreasing from 1,262.8 acre-feet in normal years to 698.1 acre-feet in single-dry years; a net loss of (564.7) acre-feet or (55%). While SBCWD has prepared its own supply projections for dry year conditions, the Commission believes it is appropriate to apply a further conservative reduction in supplies for purposes of planning tied to this review. This involves applying a flat curtailment to all water (surface and groundwater) sources of 76% to match present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought. The substantive result of applying this reduction in SBCWD's available annual water supply is a decline from 1,262.8 acre-feet in normal years to 298.07 acre-feet in drought year conditions; a net difference or loss of (964.7) acre-feet.

> The Commission projects an overall decrease of SBCWD's annual potable supplies from 1,263 to 298 acre-feet during a significant single dry-year consistent with 1977 conditions. This projection represents a **76%** overall decrease in supplies relative to the maximum yield available to SBCWD.

Marin Municipal Water District

MMWD's most recent update to its UWMP was issued in 2011 and orients the District to anticipate an overall reduction of nearly three-fourths in its available supplies during single-dry year drought conditions. This includes MMWD calculating specific reductions in single-dry year periods equaling 46.9% in its primary water sources (local surface) and 76.8% in its secondary source (Russian River) relative to normal/maximum conditions; the end and cumulative result being that total supplies reduce from 93,866 to 21,626 acre-feet and a net loss of (72,240) acre-feet. These planning reductions appear sufficiently justified and correspond with the curtailment estimates made separately by the Commission for West Marin agencies also using the 1976-77 water year as a baseline index with curtailments ranging from 76% to 38%.

> MMWD projects an overall decrease in annual potable water supplies from 93,866 to 26,134 acre-feet during a significant drought year event. This projection represents a **72%** decrease in supplies relative to the maximum yield available to MMWD.

North Marin Water District - Novato

NMWD's most recent update to its UWMP was issued in 2011 and is specific to the Novato system. This document orients NMWD to anticipate an overall reduction of nearly one-half of its potable water supplies during single dry-year drought conditions with totals decreasing from 22,454 acre-feet to 10,494 acre-feet; a net difference of (12,060) acre-feet or (46.7%). This includes NMWD calculating specific reductions, relative to maximum conditions, of 43.3% in its primary water source (Russian River) and 70.4% in its secondary source (Novato Creek). These planning reductions appear sufficiently justified and correspond with the curtailment estimates made separately by the Commission for West Marin agencies also using the 1976-77 water year as a baseline index with curtailments ranging from 76% to 38%.

NMWD projects an overall decrease in annual potable water supplies from 22,454 to 10,494 acre-feet during a significant drought year event. This projection represents a **47%** decrease in supplies relative to the maximum yield available to NMWD.

North Marin Water District - Point Reyes Station

No formal analysis has been performed by NMWD to quantify the District's water supply reliability for the Point Reyes Station system during different hydrological periods. Accordingly, and for purposes of this planning document, it appears reasonable to assume some level of curtailment will occur during extended dry periods reducing the overall supply available to NMWD. With this in mind, the Commission independently projects the overall water supply being reduced up to 14.3% during single-dry years. This reduction aligns with a modification to the present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought and detailed in the accompanying footnote.[36] The substantive effect of this drought projection is NMWD's annual water supply for the Point Reyes Station system being reduced from its normal/maximum level of 654.0 acre feet to 560.5 acre-feet; a net difference or loss of (93.5) acre-feet.

The Commission projects NMWD's annual potable water supplies for the Point Reyes Station system declining by **14%** from 654 to 561 acre-feet during significant single dry-year; a decline amount that is lessen by the addition of dry-year flows from MMWD.

[36] State Water Project Delivery Report (2013) estimates 1976-77 drought-like conditions reduces surface related supplies by 74% of normal/maximum. LAFCO has adjusted this curtailment to 38% on the rationale NMWD's supplies are already incorporate a baseline reduction in total flows in Lagunitas Creek. This assumption also applies to a 38% reduction in the 250 acre-feet of dry-year summer supplies from MMWD.

Potable Water Supply Availability and Reliability / Agencies
Table 3-7 (Marin LAFCO)

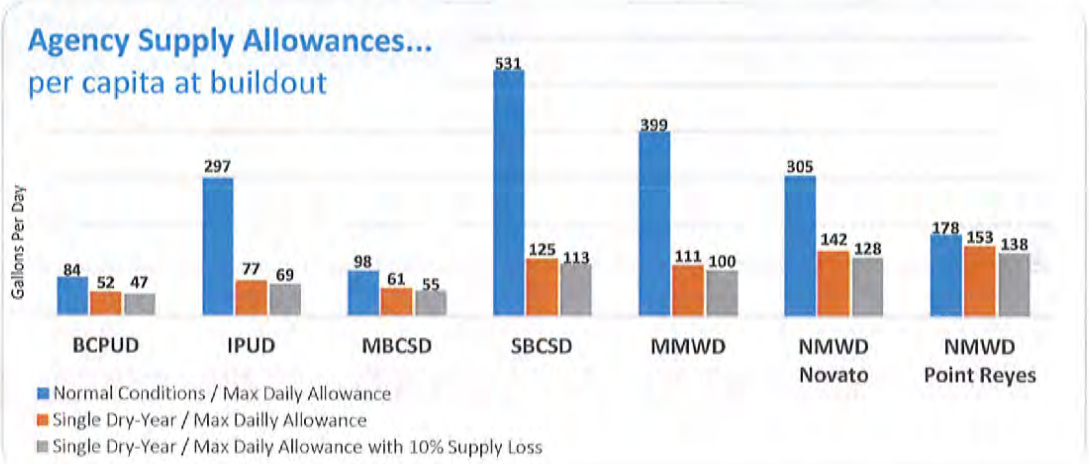
	Agency	Convey Day Max To Treatment	Convey Annual Max To Treatment	76-77 Drought Day Max To Treatment	76-77 Drought Annual Max To Treatment
		What is Accessible - normal/max conditions -		What is Accessible - single dry-year conditions -	
West Marin	BCPUD	1.09	167.00	0.68	103.50
	IPUD	2.70	526.20	1.22	135.90
	MBCSD	0.14	50.60	0.04	31.40
	SBCWD	3.45	1,262.80	0.82	298.07
East Marin	MMWD	230.80	93,866.00	68.90	26,134.00
	NMWD – Novato	86.94	22,554.00	43.97	10,493.38
	NMWD – Pt. Reyes	1.86	654.00	1.86	560.50
	Total Yield	**326.98**	**119,080.60**	**117.49**	**37,756.75**

5.0 Overall and Agency Sources / Maximum Daily Per Capita Allowances at Buildout

The Commission estimates the maximum per capita water allowance among the six affected agencies at their currently projected buildouts is an average of 373 gallons under normal conditions; i.e., an average demand exceeding this amount would produce an overall shortfall. This shared buildout allowance estimate is reduced under projected single-dry year conditions by two-thirds to an average of 118 gallons. The latter estimate is further reduced to an average of 106 gallons with the incorporation of 10% decrease in supplies due to system losses and/or other related factors.

The Commission projects the six affected agencies shared maximum per capita water allowance at buildout under normal and single dry-year conditions is an average of 373 and 118 gallons, respectively; a difference of (68%).

Maximum daily water allowances at buildout varies significantly among the six affected agencies. Under normal conditions the estimated maximum daily capita allowances range from a low of 99 gallons in MBCSD to a high of 530 gallons in SBCWD. Under projected single dry-year conditions the estimated maximum daily capita allowances range from a low of 46 gallons in BCPUD to a high of 137 gallons in NMWD-Point Reyes.



B. Demands

1.0 Overall Demands / Production Trends Over Study Period

The combined average annual potable water demand production (metered and losses) during this **study period** has totaled 12.0 billion gallons or 36,302 acre-feet (see footnote).[37] This average amount equals approximately 31% of the maximum accessible yield available to the six affected agencies and produces a per resident daily use of 126 gallons. The single highest demand year occurred in 2013 when the six agencies collectively produced 37,858 acre-feet of potable water within the seven service areas; an amount that is close to 3% higher than the five-year average, and produces a per resident daily usage of 132 gallons. The combined average peak-day demand totals 159 acre-feet and results in a peaking factor of 1.60; or 60% more than average day usage.

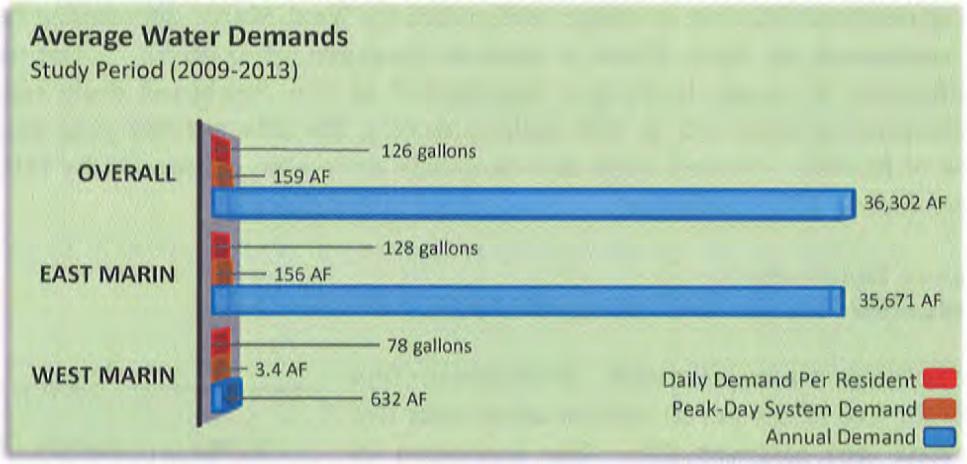
> The combined average annual potable water demand production among all six affected agencies has been 36,302 acre-feet over study period. This amount equals 31% of the maximum annual yield available and translates to a per resident daily use of 126 gallons.

Almost 99% – or 35,671 acre-feet – of the average annual potable water production among the six affected agencies during the study period has been generated in the two East Marin service areas (MMWD and NMWD-Novato). The average per resident daily use within East Marin during this period has been 128 gallons while the average peak-

> Average daily water demand per resident in the two East Marin service areas over the study period has been 128 gallons. This amount is nearly double the average rate of 77 gallons within the five service areas in West Marin.

[37] Demand trends differ based on the data range selected. LAFCO uses a five-year study period to analyze recent system demand trends given it directly aligns with the five-year cycle set under State law to prepare municipal service reviews. The 2009-2013 period covers the five years immediately preceding the start of the study work.

day demand total of 155 acre-feet produces a per capita use of 204 gallons. These amounts differ and are proportionally higher than the averages generated within West Marin's five service areas where their daily resident use has been 77 gallons and the peak-day demand total of 3.43 acre-feet produces a per capita use of 153 gallons. A notable qualification, nevertheless, exists with respect to comparing peak-day demand averages between East and West Marin where the latter's peaking factor has been 1.99 versus 1.59 in East Marin through the study period; all of which signals the relative intensity of peak demand periods is higher in West Marin and presumably attributed to tourism impacts.



Countywide Totals / Seven Service Areas	Study Period Averages	Study Period Change
Annual Total (af)	36,302.79	0.02%
Average Day (af)	99.46	0.02%
Connections	84,302.20	1.20%
Per Day Connection (g)	384.52	-1.16%
Per Day Resident (g)	126.30	-0.37%
Peak Day (af)	159.13	-10.10%
Peaking Factor	1.60	-10.12%

East Marin / Two Service Areas	5-Yr Averages	5-Yr Change
Annual Total (af)	35,670.84	0.05%
Average Day (af)	97.73	0.05%
Connections	81,636.80	0.69%
Per Day Connection (g)	390.14	-0.64%
Per Day Resident (g)	127.72	-0.32%
Peak Day (af)	155.7	-10.22%
Peaking Factor	1.59	-10.27%

West Marin / Five Service Areas	5-Yr Averages	5-Yr Change
Annual Total (af)	631.95	-1.65%
Average Day (af)	1.73	-1.65%
Connections	2,665.40	18.88%
Per Day Connection (g)	213.13	-17.27%
Per Day Resident (g)	77.68	-2.61%
Peak Day (af)	3.43	-3.52%
Peaking Factor	1.99	-1.90%

With respect to aggregate trends, and despite increases in the estimated resident populations within nearly all of the affected agencies' service areas, the overall and combined potable water demand production has remained relatively stagnant during the study period. Overall production has increased by only 8.2 acre-feet or 0.02%; an amount that is 20 times less than the corresponding population change. This modest amount of new production – markedly – shows an underlying deintensification in usage and paced by West Marin decreasing demand by (1.65%) compared to East Marin's modest increase of 0.05%. The underlying deintensification in usage is further highlighted in the combined daily resident use average decreasing from 132 to 126 gallons during the affected five year period, a net difference of (0.4%). Overall high-day demands have also decreased by (10.1%) from 172.5 acre-feet to 155.1 acre-feet.

> Overall production trends over the study period shows a deintensification in aggregate usage countywide with a rise in demands equaling only 0.02%; an amount 20 times less than the corresponding growth rate among all agencies.

2.0 Agency Demands / Production Trends Over Study Period

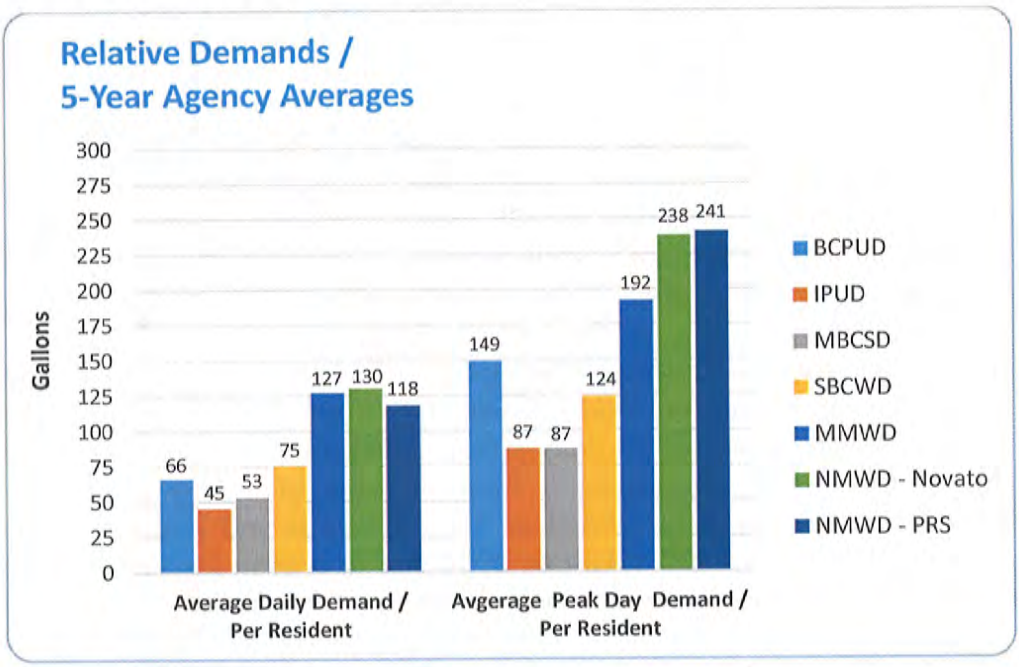
Annual potable water demand production has increased for five of the seven service areas over the study period (see footnote 37). The increases in overall demand has ranged from a low of 3.8% in NMWD-Novato to a high of 11.4% in BCPUD and most pronounced in West Marin with four of the five service areas' totals on the rise. Only MMWD and NMWD-Point Reyes Station experienced decreases in average annual demands over the study period with the latter directly attributed to the closure of a large commercial dairy customer in 2010.

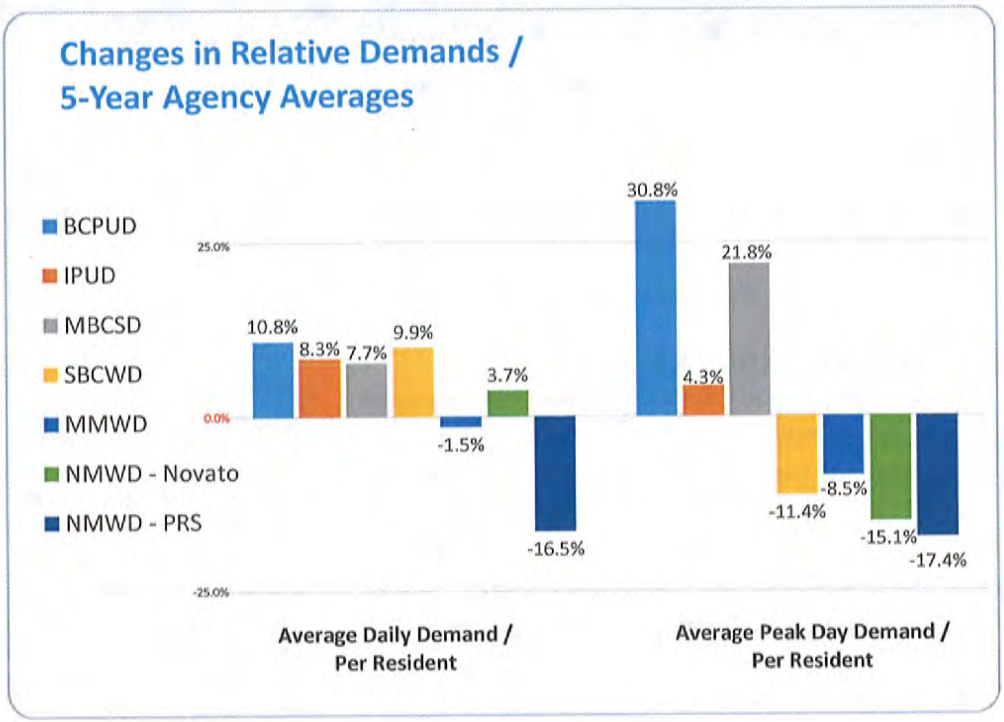
> Annual demands have been rising for most of the agencies with five of the seven service areas experiencing increases in overall water production over the study period.

As noted, relative demand – i.e., agency production measured by residents or capita – during the study period shows a marked regional distinction with uses significantly higher in East Marin compared to West Marin. The daily per capita demand in East Marin during the study period essentially matched with MMWD at 127 gallons and NMWD-Novato at 130 gallons. The daily per capita demand in West Marin during the study period was more varied with a low of 45 gallons in IPUD and a high of 118 gallons in NMWD-Point Reyes Station. Further, and markedly, all five service areas experiencing increases in their relative demand over the study period – and specifically BCPUD, IPUD, MBCSD,

> Five of the seven service areas – BCPUD, IPUD, MBCSD, SBCWD, and MMWD – experienced increases in their relative water demands and at a rate exceeding their respective population change during the study period; a dynamic suggesting system usage – and not growth – is driving new demands.

SBCWD, and MMWD – did so at a rate that exceeded their corresponding change in population over the five-year period; all of which suggest an intensity in usage – and not development – underlies the new demand on water.





Bolinas Community Public Utility District

BCPUD's average annual potable water production demand has been 37.8 million gallons or 115.9 acre-feet through study period. The most recent completed year showed total demand/production at 41.5 million gallons or 127.4 acre-feet. This most recent amount represents an average daily water demand for the entire distribution system of 0.113 million gallons or 0.35 acre-feet; an amount that is further broken down to 194 gallons per day for every service connection. Per capita use has similarly increased with a five-year average of 66 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 0.217 million gallons or 0.68 acre-feet and slightly less than double the daily average and produces a peaking factor of 1.92. Overall BCPUD has experienced a total increase of 11.4% in water demand production over the five-year period or 2.3% annually and largely attributed to a sharp rise in usage between 2012 and 2013 due to system flushing; demands over the preceding four-year period were largely stagnant from one year to the next.

BCPUD's overall average annual water demand production during the study period has been 116 acre-feet and translates to a daily per resident take of 66 gallons. Annual demands have increased by 11% with an average peaking-factor of 2.0. The increase in usage contrast with the existing moratorium that has precluded any estimated new residents.

BCPUD's Water Demand Production
Table 3-8 (BCPUD / Marin LAFCO)

Category	2009	20 -baseli	5-Year Average	5-Year Change
Annual Total	114.4	127.4	115.8	11.4%
Average Day	0.31	0.35	0.36	12.9%
Connections	587	587	584	0.0%
Per Day Connection	174g	194g	176 gallons	11.5%
Per Day Resident	65g	72g	66 gallons	10.8%
Peak Day	0.52	0.68	0.72	31.8%
Peaking Factor	1.67p	1.94p	2.0 peaking	16.2%

- Amounts in Acre Feet Unless Otherwise Noted

Inverness Public Utility District

IPUD's average annual water production demand has been 23.2 million gallons or 71.2 acre-feet through the study period. The most recent completed year showed total demand at 26.0 million gallons or 79.78 acre-feet. This recent amount represents an average daily water demand for the entire distribution system of 0.071 million gallons or 0.22 acre-feet; an amount that is further broken down to 139 gallons per day for every service connection. Per capita use has similarly increased relative to per connections with a five-year average of 45 gallons. The peak-

IPUD's overall average annual water demand production during the study period has been 71 acre-feet and translates to a daily per resident take of 45 gallons. Annual demands have increased by 8% with an average peaking-factor of 1.95. The increase in usage is more than two times greater than the corresponding estimated growth rate for the service area.

day demand – the highest one day sum for the affected year – totaled 0.137 million gallons or 0.42 acre-feet and slightly less than double the daily average and produces a peaking factor of 1.91. Overall IPUD has experienced an overall increase of 8.4% in water demands over the five-year review period or 1.7% annually and largely attributed to a sharp rise in usage between 2012 and 2013. This overall increase exceeds the estimated population growth within IPUD by over a factor of two and suggests land use intensification is driving new usage given actual new development has been limited to three new connected residences.

IPUD's Water Demand Production
Table 3-9 (IPUD / Marin LAFCO)

Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	73.6	79.8	71.2	8.4%
Average Day	0.20	0.22	0.19	8.4%
Connections	506	509	508	0.6%
Per Day Connection	130g	139g	125 gallons	6.9%
Per Day Resident	48g	52g	45 gallons	8.3%
Peak Day	0.40	.42	0.37	5.0%
Peaking Factor	2.0p	1.91p	1.95 peaking	(4.5%)

- Amounts Shown in Acre Feet Unless Otherwise Noted

Muir Beach Community Services District

MBCSD's average annual water production demand has been 8.2 million gallons or 25.37 acre-feet through the study period. The most recent completed year showed total demand at 8.7 million gallons or 26.93 acre-feet. This most recent amount represents an average daily water demand for the entire system of 24,048 gallons or 0.074 acre-feet; an amount that is further broken down to 151 gallons per day for every service connection. Per capita use has similarly increased relative to per connections with a five-year average of 53 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 0.122 acre-feet and was nearly two-thirds greater than the annualized daily average and results in a peaking factor of 1.66. Overall MBCSD has experienced an increase of 8.8% in potable water demands over the five-year period or 1.76% annually. This overall increase outpaces the estimated population change by four-fold and appears largely attributed to the intensification of existing uses.

MBCSD's overall average annual water demand production during the study period has been 27 acre-feet and translates to a daily per resident take of 53 gallons. Annual demands have increased by 9% with an average peaking-factor of 1.67. The increase in usage is more than four times greater than the corresponding estimated growth rate for the service area.

MBCSD's Potable Water Demands
Table 3-10 (MBCSD /Marin LAFCO)

Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	24.76	26.93	25.37	8.8%
Average Day	0.068	0.074	0.0696	8.8%
Connections	156	159	158	1.9%
Per Day Connection	142g	151g	144 gallons	6.3%
Per Day Resident	52g	56g	53 gallons	7.7%
Peak Day	0.098	0.122	0.116	24.5%
Peaking Factor	1.44p	1.66p	1.67 peaking	15.3%

- *Amounts Shown in Acre Feet Unless Otherwise Noted*

Stinson Beach County Water District

SBCWD's average annual water production demand has been 53.7 million gallons or 164.8 acre-feet through the study period. The most recent completed year showed a total water demand of 55.6 million gallons or 170.6 acre-feet. This most recent amount represents an average daily water demand for the entire distribution system of 0.152 million gallons or 0.47 acre-feet; an amount that is further broken down to 209 gallons per day for every service connection. Per capita use has similarly decreased relative to per connections with a four year average of 75 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 0.238 million gallons or 0.73 acre-feet and was exactly double the daily average or a peaking factor of 1.55. SBCWD has experienced an overall change of 9.6% in water demand production over the four-year period covered or 2.4% annually. (Production for 2009 was not available.) The overall increase in water demand production significantly outpaces the corresponding change in estimated population growth – 0.7% – by over ten-fold and suggest demands are largely rising due to the intensification of uses among existing development.

SBCWD's overall average annual water demand production during the study period has been 165 acre-feet and translates to a daily per resident take of 75 gallons. Annual demands have increased by 10% with an average peaking-factor of 1.67. The increase in usage is more than 10 times greater than the corresponding estimated growth rate for the service area.

SBCWD's Water Demand Production
Table 3-11 (SBCWD /Marin LAFCO)

Category	2010	2013 -baseline-	4-Year Average	4-Year Change
Annual Total	155.7	170.7	164.8	9.6%
Average Day	0.43	0.47	0.45	9.3%
Connection	724	727	726	0.4%
Per Day Connection	192g	210g	203 gallons	9.4%
Per Day Resident	71g	78g	75 gallons	9.9%
Peak Day	0.82	0.73	0.75	(11.0%)
Peaking Factor	1.91p	1.55p	1.67 peaking	(18.8%)

- *Amounts Shown in Acre Feet Unless Otherwise Noted*

Marin Municipal Water District

MMWD's average annual water production demand has been 8.6 billion gallons or 26,521 acre-feet through the study period. The most recent completed year showed total demand at 8.9 billion gallons or 27,403 acre-feet. This most recent amount represents an average daily water demand production for the entire distribution system of 24.4 million gallons or 75.1 acre-feet; an amount that is further broken down to 399 gallons per day for every active service connection. Per capita use has similarly decreased in step with connections with a five-year average of 127 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 106.5 acre-feet and was one-half greater than annualized daily average and results in a peaking factor of 1.53. MMWD has experienced an overall change of (1.6%) in potable water demand production over the five-year period or (0.3%) annually. This decrease has been accomplished irrespective of a corresponding projected increase in service population within MMWD's distribution system over the same time period of 0.07% annually. The overall decrease in usage appears largely attributed to ongoing investment in conservation and highlighted by rebate programs for high-efficiency plumbing fixtures and offering free consultation visits to implement water-wise uses.

MMWD's overall average annual water demand production during study period has been 26,521 acre-feet and translates to a daily per resident take of 127 gallons. Annual demands decreased by (1.6%) with an average peaking-factor of 1.51. The decrease in usage contrasts with the corresponding estimated growth rate for the service area.

MMWD's Potable Water Demands
Table 3-12 (MMWD /Marin LAFCO)

Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	27,807	27,403	26,521	(1.6%)
Average Day	76.2	75.1	72.6	(1.4%)
Connections	60,903	61,391	61,177	0.8%
Per Day Connection	408g	399g	387 gallons	(1.7%)
Per Day Resident	134g	132g	127 gallons	(1.5%)
Peak Day	115.9	106.5	109.6	(8.1%)
Peaking Factor	1.52	1.42	1.51	(6.8%)

- Amounts Shown in Acre Feet Unless Otherwise Noted

North Marin Water District – Novato

NMWD's average annual water production demand for the Novato system has been 82.9 billion gallons or 9,149.8 acre-feet through the study period. The most recent completed year showed total demand at 3.2 billion gallons or 9,796.4 acre-feet. This most recent amount represents an average daily water demand for the entire Novato system of 8.7 million gallons or 26.8 acre-feet; an amount that is further broken down to 426 gallons per day for every active service connection. Per capita use has similarly increased relative to per connections with a five year average of 130 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 45.4

acre-feet and was over two-thirds greater than annualized daily average and results in a peaking factor of 1.69. The Novato system has experienced an overall change of 3.8% in water demand production over the five-year period or 0.8% annually. This overall change outpaces the projected change in population in the Novato system over the same time period – 0.08% annually – by ten-fold, and appears substantively attributed to weather and economic variations as well as the intensification of uses given the lack of significant new development in the system.

NMWD's overall average annual water demand production for the Novato system during the study period has been 9,150 acre-feet and translates to a daily per resident take of 130 gallons. Annual demands have increased by 3.8% with an average peaking-factor of 1.84. The increase in usage is more than 10 times greater than the corresponding estimated growth rate for the service area.

NMWD's Water Demands – Novato
Table 3-13 (NMWD /Marin LAFCO)

Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	9,373.2	9,796.4	9,149.8	3.8%
Average Day	25.7	26.8	25.1	3.8%
Connections	20,416	20,492	20,459	0.4%
Per Day Connection	410g	426g	399 gallons	3.9%
Per Day Resident	134g	139g	130 gallons	3.7%
Peak Day	53.3	45.4	46.1	(14.8%)
Peaking Factor	2.07p	1.69p	1.84 peaking	(18.4%)

- Amounts Shown in Acre Feet Unless Otherwise Noted

North Marin Water District – Point Reyes St.

NMWD's average annual water production demand for the Point Reyes Station system has been 83.6 million gallons or 256.6 acre-feet through the term of study period. The most recent completed year showed total demand at 82.6 million gallons or 253.7 acre-feet. This most recent amount represents an average daily water demand for the entire Point Reyes Station system of 0.226 million gallons or 0.7 acre-feet; an amount that is further broken down to 291 gallons per day for every active service connection. Per capita use has similarly decreased relative to per connections with a five-year average of 118 gallons. The peak-day demand – the highest day sum – totaled 1.3 acre-feet and was nearly double the annualized daily average and results in a peaking factor of 1.9. The Point Reyes Station system has experienced an overall change of (15.7%) in water demands over the five-year period or (3.2%) annually. This overall change is substantially less than the projected change in population in the Point Reyes Station system over the

NMWD's overall average annual water demand production for the Point Reyes Station system during the study period has been 257 acre-feet and translates to a daily per resident take of 118 gallons. Annual demands have decreased by (15%) with an average peaking-factor of 1.9. The decrease in usage is more than eight times less than the corresponding estimated growth rate for the service area.

same time period – 0.4% annually – by over eight-fold. This large decrease in usage is tied to the closure of a prominent dairy operation at the beginning of the review endpoints and reflected with uses declining by 20% from 301.1 acre-feet in 2009 to 242.5 acre-feet in 2010.

NMWD's Water Demands – Point Reyes Station
Table 3-14 (NMWD /Marin LAFCO)

Category	2009	2013 -baseline-	5-Year Average	5-Year Change
Annual Total	301.1	253.7	256.6	(15.7%)
Average Day	0.82	0.70	0.70	(14.6%)
Connections	760	776	770	0.2%
Per Day Connection	352g	294g	294 gallons	(16.5%)
Per Day Resident	140g	117g	118 gallons	(16.4%)
Peak Day	1.46	1.23	1.45	(15.8%)
Peaking Factor	1.8p	1.8p	2.1 peaking	1.6%

- Amounts Shown in Acre Feet Unless Otherwise Noted

3.0 Overall Demands / LAFCO Projections over Next 10 Years

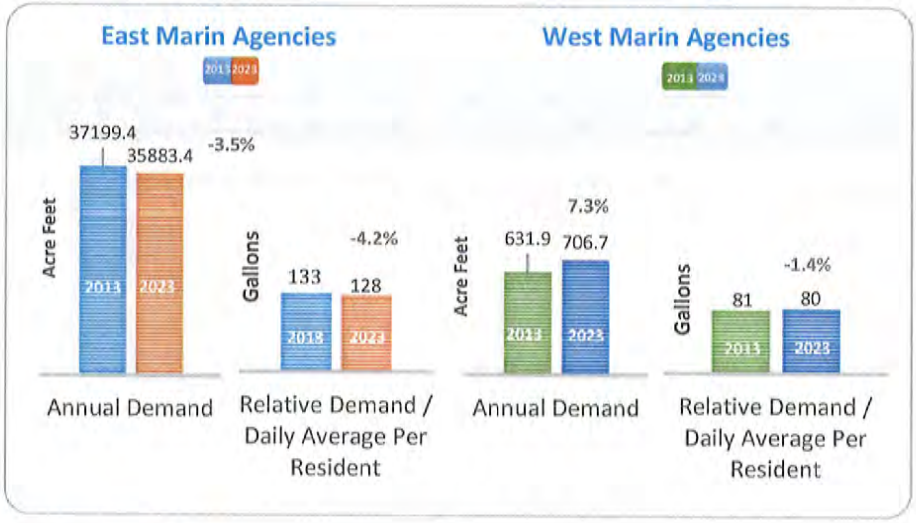
The Commission projects the six affected agencies will collectively experience an overall and combined decrease in demand production of (3.4%) over the next 10-years from the term end of the study period. This projection is based on the Commission's own regression analyses performed for all seven service areas and would result in the total savings of (1.0) billion gallons or (1,267.8) acre-feet of potable water production by 2023. This overall decrease, pertinently, is projected despite an anticipated resident growth increase of 0.8% by 2023 as well as individual agency increases for four of the seven service areas as detailed in the succeeding sections. The resulting per capita daily demand, accordingly, is expected to be reduced from the baseline year from 131 gallons to 126 gallons over the 10-year period. Overall peak-day demands, however and due to forwarding recent trends therein, are projected to continue to increase the baseline year from 155.1 to 161.5 in 2023; a net change of 4.3%.

The Commission projects an overall aggregate decrease in potable water production among the six affected agencies of (3.4%) with annual totals over the baseline year lowering from 37,858 to 36,590 acre-feet by 2023; a net savings of (1,268) acre-feet. This projection is also reflected in relative demand with the per capita daily usage decreasing from 131 to 126 gallons.

Going forward a dichotomy is projected in which there is overall savings in potable water demand production despite the majority of the individual service areas experiencing increases through 2023. This distinction is highlighted by comparing projected demands among the two regions with East Marin expected to save (1,316.0) acre-feet or (3.5%) of its current baseline usage by 2023

Decreases in projected annual demand production in East Marin is driving overall countywide savings despite anticipated use increases in West Marin.

while West Marin is projected to increase use by 7.3% or 48.2 acre-feet by 2023. A regional comparison follows.



4.0 Agency Demands / LAFCO Projections Over 10 Next Years

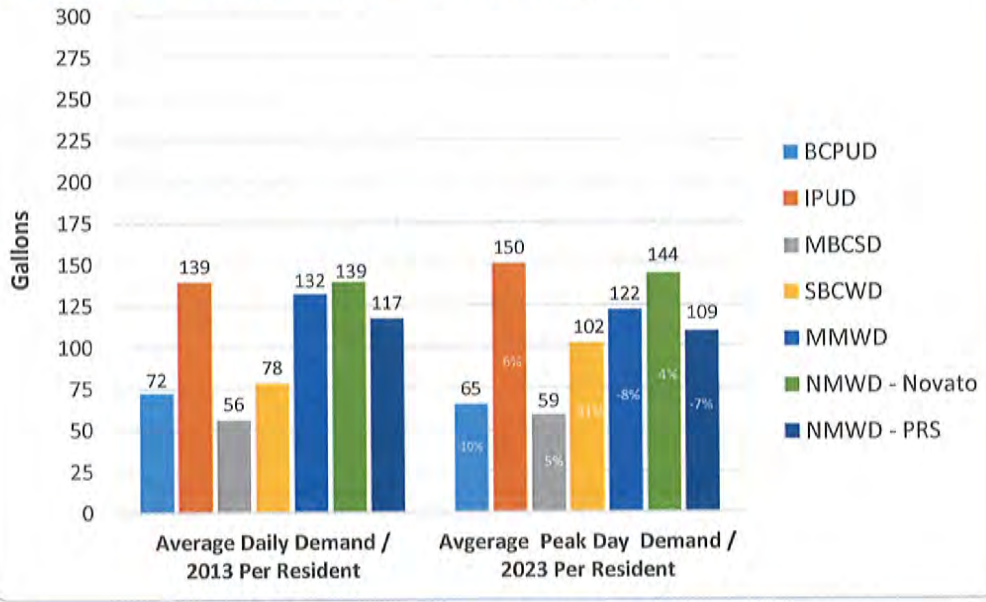
The Commission projects overall annual potable water demand production will increase for four of the seven service areas served by the six affected agencies from the term date of the study period and through the next 10-year period to 2023. These affected agencies and their overall expected increases in potable demand production – which is based on regression analyses tied to the prior five-year totals less noticeable outliers – are SBCWD at 33.4%, MBCSD at 9.7%, IPUD at 8.5%, and NMWD-Novato at 4.5%. These four service areas are on pace to ultimately experience an overall and combined increase in potable demand of 506.2 acre-feet or 5.0% over their shared baseline year totals. Decreases are projected for the remaining three service areas based on the same regression analyses and involve reductions in annual potable water demands for BCPUD at (10.4%), MMWD at (6.4%), and NMWD-Point Reyes at (1.9%). These three service areas are on pace to experience an overall decrease of (1,774) acre-feet or (6.4%).

Individual annual demands are expected to increase for four of the seven service areas served by the six affected agencies by collectively 506 acre-feet or 5.0% and involve SBCWD, MBCSD, IPUD, and NMWD-Novato. The remaining three service areas served by MMWD, BCPUD, and NMWD-Point Reyes are expected to experience individual decreases that collectively total (1,774) acre-feet or (6.4%).

The Commission projects similar changes in relative demand – i.e., agency production measured by residents – for the seven service areas, though at different and more significant rates compared to estimated annual trends. Relative demand among SBCWD, MBCSD, IPUD, and NMWD-Novato - which are the four service areas expected to incur overall annual increases in potable production – are expected to experience an escalation in their average daily per capita usage by a combined 10.8% over the next 10 year period. This projection is more than double these four service areas' expected overall annual increase in potable demands, and as such indicates an intensity in usage that exceeds these areas' anticipated population growth. Relative demand among the other three service areas served by BCPUD, MMWD, and NMWD-Point Reyes Station is projected to decrease with the combined change in average per capita usage lowering by (7.8%). This latter amount is nearly one-fourth greater in terms of savings than the projected decrease in overall annual demands, and as such indicates greater efficiencies going forward with respect to conservation.

It is projected that four of the seven service areas – SBCWD, MBCSD, IPUD, and NMWD-Novato – will experience overall increases in their relative demand (i.e., average daily usage per capita) by a collective total of 10.8% over the next 10-year period, and suggests further intensification of usage that exceeds anticipated growth changes during the period. Savings in relative demand for the other three service areas – BCPUD, MMWD, and NMWD-Point Reyes Station – are projected and indicates greater usage efficiencies going forward within these communities.

Relative Demands / LAFCO Projections Going Forward to 2023



Bolinas Community Public Utility District

The Commission projects BCPUD's overall annual potable demands will revert back to pre-2013 levels and before the recent production spike tied to system flushing and decrease over the baseline year by 13.2 acre-feet or (10.4%) over the next 10-year period. This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar decrease in relative demand with per capita usage decreasing by (9.7%) from 72 gallons to 65 gallons by 2023.

LAFCO projects BCPUD's annual potable demands will decrease over the baseline year by (10.4%) in 2023. It is also projected relative demand as measured by per capita usage will decrease by (9.7%); the latter amount reversing direction in recent per capita use trends over the study period.

Projected BCPUD Water Demands
Table 3-15 (Marin LAFCO)

Category	-2013- Baseline	2023	10-Year Change
Annual Total	127.4	114.2	(10.4%)
Average Day	0.36	0.31	(13.9%)
Peak Day	0.68	0.75	10.3%
Connections	587	587	0.0%
Per Day Connection	194 gallons	193 gallons	(0.5%)
Residents	1,574	1,574	0.0%
Per Day Resident	72 gallons	65 gallons	(9.7%)

- Amounts in Acre Feet Unless Stated Otherwise

Inverness Public Utility District

The Commission projects IPUD's overall annual potable demands will increase over the baseline year going forward and through the next 10-year period by 6.5 acre-feet or 8.1%. This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar increase in relative demand with per capita usage increasing by 5.8% from 52 gallons to 55 gallons by 2023. This latter amount indicates the increase in relative demand will decelerate or slow by more than one-half compared to increases generated over the most recent five-year period.

LAFCO projects IPUD's annual potable demands will increase over the baseline year by 8.1% in 2023. It is also projected relative demand as measured by per capita usage will increase by 5.8%; the latter amount representing a 65% cutback in the rate increase in per capita usage over the study period.

Projected IPUD Water Demands
Table 3-16 (Marin LAFCO)

Category	-2013- Baseline	2023	10-Year Change
Annual Total	79.8	86.3	8.1%
Average Day	0.22	0.24	9.1%
Peak Day	0.42	0.46	9.5%
Connections	509	515	1.2%
Per Day Connection	125 gallons	150 gallons	20.0%
Residents	1,375	1,392	1.2%
Per Day Resident	52 gallons	55 gallons	5.8%

- Amounts in Acre Feet Unless Stated Otherwise

Muir Beach Community Services District

The Commission projects MBCSD's overall annual potable demands will increase over the baseline year going forward and through the next 10-year period by 2.6 acre-feet or 9.7%. This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar increase in relative demand with per capita usage increasing by 5.1% from 56 gallons to 59 gallons by 2023. This latter amount indicates the increase in relative demand will decelerate or slow by more than double compared to increases generated over the most recent five-year period.

LAFCO projects MBCSD's annual potable demands will increase over the baseline year by 9.7% in 2023. It is also projected relative demand as measured by per capita usage will increase by 5.1%; the latter amount representing a 130% cutback in the rate increase in per capita usage over the study period.

Projected MBCSD Water Demands
Table 3-17 (Marin LAFCO)

Category	-2013- Baseline	2023	10-Year Change
Annual Total	26.93	29.54	9.7%
Average Day	0.074	0.081	9.5%
Peak Day	0.122	0.135	10.7%
Connections	159	165	3.6%
Per Day Connection	151 gallons	160 gallons	6.0%
Residents	431	450	4.4%
Per Day Resident	56 gallons	59 gallons	5.1%

- Amounts in Acre Feet Unless Stated Otherwise

Stinson Beach County Water District

The Commission projects SBCWD's overall annual potable demands will increase over the baseline year going forward and through the next 10-year period by 57.0 acre-feet or 33.4%. This projection has been calculated using regression analysis involving production demands during the last four years of the study period and shows a similar increase in relative demand with per capita usage increasing by 30.8% from 78 gallons to 102 gallons by 2023. This latter amount indicates the increase in relative demand will further escalate by over one-half more compared to the rate of increase generated over the study period.

LAFCO projects SBCWD's annual potable demands will increase over the baseline year by 33.4% in 2023. It is also projected relative demand as measured by per capita usage will increase by 30.8%; an amount that would add and escalate to the current increase in the per capita rate usage by 56% over the study period.

Projected SBCWD Water Demands
Table 3-18 (Marin LAFCO)

Category	-2013- Baseline	2023	10-Year Change
Annual Total	170.7	227.7	33.4%
Average Day	0.47	0.62	31.9%
Peak Day	0.73	1.04	41.8%
Connections	727	737	1.4%
Per Day Connection	210 gallons	276 gallons	31.4%
Residents	1,957	1,985	1.4%
Per Day Resident	78 gallons	102 gallons	30.8%

- Amounts in Acre Feet Unless Otherwise Noted

Marin Municipal Water District

The Commission projects MMWD's overall annual potable demands will decrease over the baseline year and through the next 10-year period by (1,756.1) acre-feet or (6.4%). This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar decrease in relative demand with per capita usage lowering by (7.6%) from 132 gallons to 122 gallons by 2023. This latter amount indicates the rate of relative demand will by over double or 155% compared to savings achieved over the study period.

LAFCO projects MMWD's annual potable demands will decrease over the baseline year by (6.4%) in 2023. It is also projected relative demand as measured by per capita usage will decrease by (7.6%); an amount that more than doubles the reduction rate in per capita usage over study period.

LAFCO Projected Demands for MMWD
Table 3-19 (Marin LAFCO)

Category	-2013- Baseline	2023	10-Year Change
Annual Total	27,403.0	25,646.9	(6.4%)
Average Day	75.1	70.3	(6.4%)
Peak Day	106.5	106.2	(0.3%)
Connections	61,391	62,380	1.6%
Per Day Connection	399 gallons	367 gallons	(8.0%)
Residents	186,048	187,128	0.6%
Per Day Resident	132 gallons	122 gallons	(7.6%)

- *Amounts in Acre Feet Unless Provided Otherwise*

North Marin Water District – Novato

The Commission projects NMWD's Novato system will experience an overall increase in annual potable demands over the baseline year and through the next 10-year period of 440.1 acre-feet or 4.5%. This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar increase in relative demand with per capita usage increasing by 3.6% from 139 gallons to 144 gallons by 2023. This latter amount indicates the increase in relative demand will decelerate or slow by two-thirds compared to increases generated over study period.

LAFCO projects the Novato system's annual potable demands will increase over the baseline year by 4.5% in 2023. It is also projected relative demand as measured by per capita usage will increase by 3.6%; the latter amount representing a 66% cutback in the rate increase in per capita usage over the study period.

LAFCO Projected Demands for NMWD-Novato
Table 3-20 (Marin LAFCO)

Category	-2013- Baseline	2023	10-Year Change
Annual Total	9,976.4	10,236.5	4.5%
Average Day	26.8	28.0	4.5%
Peak Day	45.4	51.5	7.3%
Connections	20,492	20,636	15.3%
Per Day Connection	426 gallons	442 gallons	3.8%
Residents	62,891	63,396	0.4%
Per Day Resident	139 gallons	144 gallons	3.6%

- *Amounts in Acre Feet Unless Provided Otherwise*

North Marin Water District – PRS

The Commission projects NMWD's Point Reyes Station system will experience an overall decrease in annual potable demands over the next 10-year of 4.7 acre-feet or (1.85%). This projection has been calculated using regression analysis involving production demands during the five-year study period and shows a similar increase in relative demand with per capita usage decreasing by (6.8%) from 117 gallons to 109 gallons by 2023. This latter amount indicates the decrease in relative demand will decelerate or slow by more than one-half compared to savings generated over the study period.

LAFCO projects the Point Reyes Station system's annual potable demands will decrease over the baseline year by (1.9%) in 2023. It is also projected relative demand as measured by per capita usage will decrease by (6.8%); the latter amount representing a 59% cutback in the current rate of savings in per capita usage.

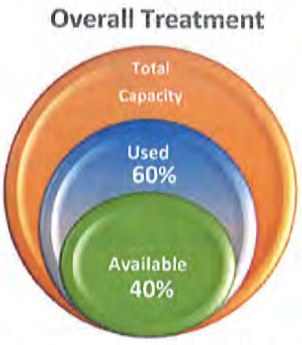
LAFCO Projected Demands for NMWD-Point Reyes St.
Table 3-21 (Marin LAFCO)

Category	-2013- Baseline	2023	10-Year Change
Annual Total	253.7	249.0	(1.9%)
Average Day	0.70	0.68	(2.9%)
Peak Day	1.23	1.43	16.20%
Connections	776	779	(0.4%)
Per Day Connection	294g	284g	(3.4%)
Residents	1,954	2,036	2.1%
Per Day Resident	117g	109g	(6.8%)

- Amounts in Acre Feet Unless Provided Otherwise

C. Potable Treatment and Storage Facilities

1.0 Treatment Facilities



The six affected agencies have a combined maximum daily treatment capacity within their seven service areas of 86.7 million gallons or 266.3 acre-feet. This total treatment capacity among the six affected agencies allows these systems to jointly treat up to four-fifths of the daily raw water supplies available to their service areas under normal/maximum conditions. The total treatment capacity also allows the affected agencies to accommodate up to 60% of the current and combined peak-day demand average over the study period; the result being there is 40% available capacity going forward in meeting average peak day demands.

Individual agency treatment capacities within the seven service areas varies with respect to available surplus in meeting average peak-day demands over the study period from a

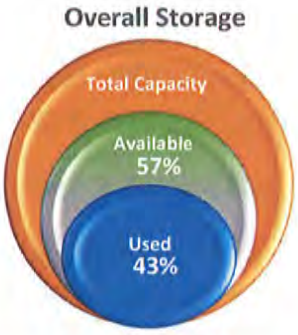
high of 73.6% with MBCSD to a low of (2.9%) with BCPUD. A summary of individual agency treatment capacities with a breakdown of their used and available allowances relative to meeting their study period averages follows.

Individual Agencies' Treatment Capacities
Table 3-22 (Marin LAFCO)

Category	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD Novato	NMWD Point Reyes
Total Capacity	0.70 100%	0.53 100%	0.44 100%	1.19 100%	181.00 100%	80.26 100%	2.14 100%
Used Capacity	0.72 103%	0.37 70%	0.12 26%	0.75 63%	109.60 61%	46.10 57%	1.45 68%
Available Capacity	(0.02) (3%)	0.16 30%	0.32 68%	0.44 56%	71.40 39%	34.16 43%	0.69 32%

- *Amounts in Acre Feet Unless Provided Otherwise*
- *Used and Available Capacities Based on Agencies' Average Five-Year Peak-Day Demands*

2.0 Storage Facilities



The six affected agencies have collectively available up to 121.1 million gallons or 373.5 acre-feet in storage within their distribution systems. This total storage capacity allows the affected agencies to jointly hold up to 140.3% of the maximum amount of daily treated supplies available to enter the underlying seven service areas. This total storage capacity is currently at 42.6% of use relative to the current and combined peak-day demand average over the study period and means 57.4% of additional capacity going forward. The total storage capacity also provides the six affected agencies the collective ability to accommodate up to 2.3 days of peak-day demands without system recharge.

Individual agency storage capacities within the seven service areas varies with respect to available surplus in meeting average peak-day demands over the last five-year period from a high of 91.6% with MBCSD to a low of 54.7% with NMWD-Point Reyes Station. A summary of individual agency storage capacities with a breakdown of their used and available allowances relative to meeting their five-year peak-demand averages follows.

Individual Agencies' Storage Capacities
Table 3-23 (Marin LAFCO)

Category	BCPUD	IPUD	MBCSD	SBCWD	MMWD	NMWD Novato	NMWD Point Reyes
Total Capacity	2.68 100%	1.30 100%	1.38 100%	3.64 100%	250.90 100%	110.40 100%	3.20 100%
Used Capacity	0.72 27%	0.37 29%	0.12 8%	0.75 21%	109.60 44%	46.10 42%	1.45 46%
Available Capacity	1.96 73%	0.93 71%	1.26 92%	2.89 79%	141.3 56%	64.3 58%	1.75 54%

- *Amounts in Acre Feet Unless Provided Otherwise*
- *Used and Available Capacities Based on Agencies' Average Five-Year Peak-Day Demands*

D. Infrastructure Capacity to Demand Ratios

Under normal and non-peak conditions all six affected agencies currently have available capacity in supply, storage, and treatment relative to accommodating existing demands in their seven service areas based on study period averages. The affected agencies also have generally sufficient capacities to accommodate current peak-day demands under normal conditions with some limited exceptions involving BCPUD (storage) and MBCSD (supplies). These capacities under normal conditions are also expected to accommodate projected demands through the timeframe of this study in 2023 with some exceptions as detailed below. All agencies, however and significantly, are expected to experience system stresses – albeit to different degrees – under projected single-dry year conditions when annual and daily supplies revert to 1977 conditions and in particular in meeting *peak-day demands* through 2023 (see accompanying footnote).[38]

> Under normal conditions the combined potable supplies established by the six affected agencies have more than two-thirds additional capacity to meet current annual demands among the seven service areas with a current demand-to-supply ratio of 31%. Minimal changes to this ratio are expected through 2023.

1.0 Supply Capacities to Demands

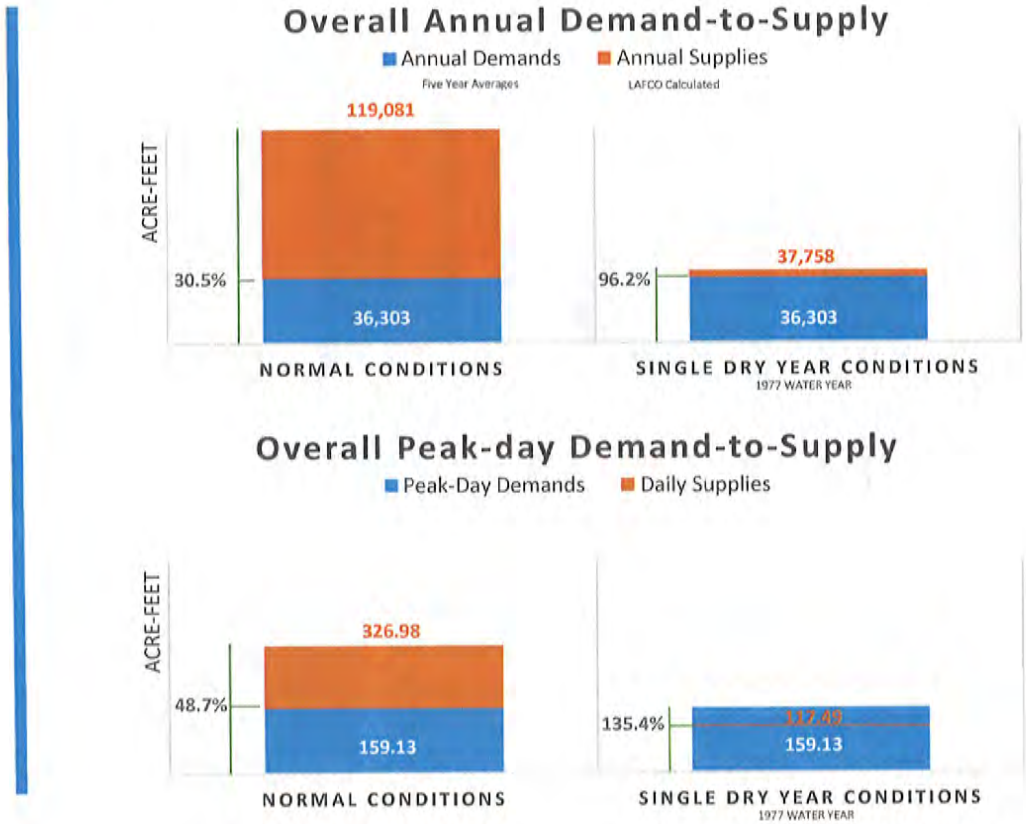
Existing potable water supplies are sufficient for all six affected agencies to meet current annual demands within the seven service areas under normal and non-peak conditions now and through the end of this study period (2023). This sufficiency is marked by calculating the current combined annual demand-to-supply ratio covering all seven service areas at 30.5% with an expected rise to 30.7% by 2023; ratios that denote overall surpluses of available potable water supplies during normal conditions of more than two-thirds exists now and through the next 10-year period. Higher ratios are calculated for peak-day demands under normal supply conditions with the overall baseline totaling 48.7% and rising to 49.4% in 2023 with only two agencies – BCPUD and MMWD – showing deficits as detailed in the succeeding section.

> All six agencies generally have adequate capacities in meeting current and projected demands within the 10-year timeframe of this review under normal conditions. All six agencies, however, are projected to experience moderate to significant system stress under projected single-dry year conditions paralleling 1977.

[38] Consideration of peak-day demands are particularly germane to this study given Title 22 of the Code of Regulations requires all public community water systems maintain sufficient source, treatment, and storage capacities to meet their peak day demands.

The availability of potable supplies under projected single-dry year conditions to match 1977 conditions – a standard threshold used for drought planning – creates a different narrative in which overall supplies decrease by more than two-thirds from 119,081 acre-feet to 37,758 acre-feet. This projected decrease, markedly, creates capacity challenges for most of the affected agencies and generates a current and overall combined annual demand-to-supply ratio of 96.2% and rises to 96.9% by 2023.[39] These projected system stresses under single dry-year conditions are further marked during high-use periods with peak-day demand-to-supply ratios equaling 135.4% and rising to 137.5% in 2023; amounts that show more than a one-third capacity deficit.

Under projected single dry-year conditions set to parallel 1977 the combined potable supplies established by the six affected agencies are collectively near capacity with a current annual demand-to-supply ratio of 96%; a ratio that rises to 135% or (35%) during peak-day demand periods.



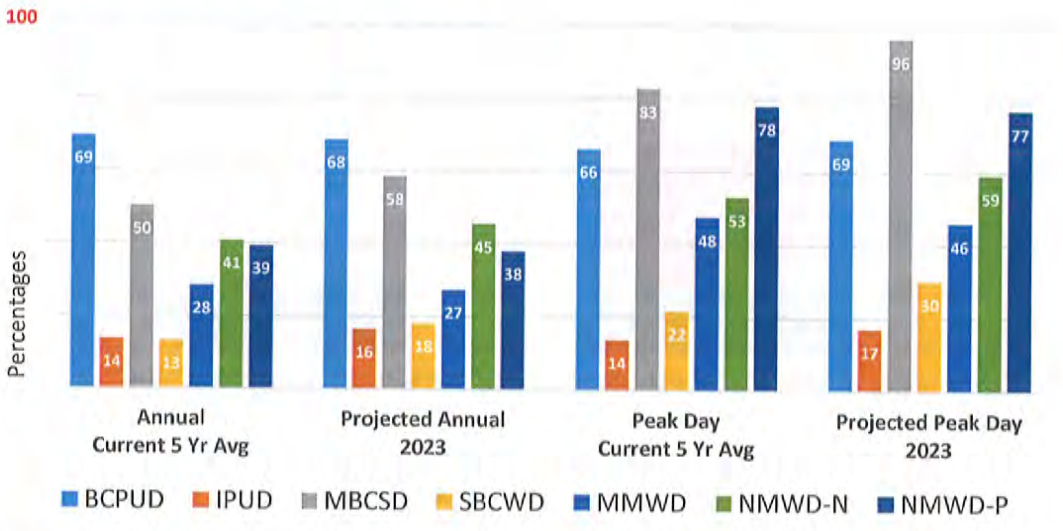
[39] It is reasonable to assume system demands will remain constant during a single-dry year drought given consumers have not adjusted their usage trends relative to the prior year.

Under normal conditions demand-to-supply ratios for all six affected agencies show sufficient capacities to accommodate current and projected annual and peak-day usage within their seven service areas now and going forward to 2023. Individual annual demand-to-supply ratios range from a low of 15.1% for IPUD to a high of 76.3% for BCPUD with minimal changes for any expected over the next 10 year period. Individual peak-day demand-to-supply ratios are generally much higher but remain well within capacity for most of the agencies with the lone exception of BCPUD which currently tallies 82.7% and expected to rise to 96.4% by 2023.

All six agencies have positive demand-to-supply ratios under normal conditions with the lone qualifier BCPUD is approaching capacity with respect to accommodating peak-day uses.

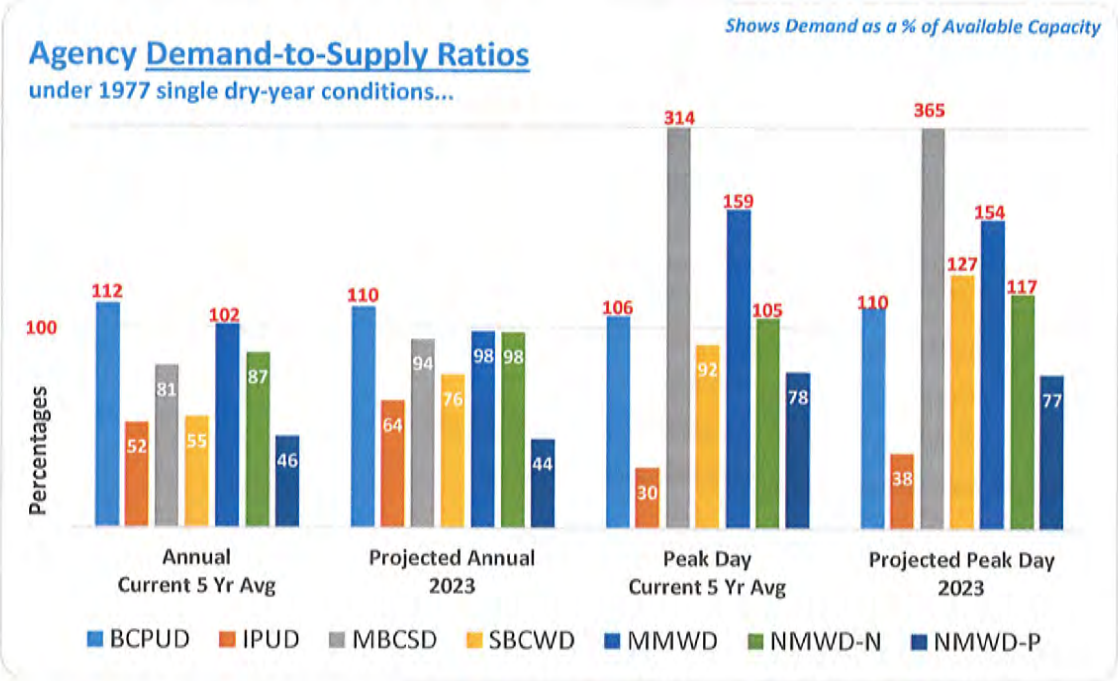
Shows Demand as a % of Available Capacity

Agency Demand-to-Supply Ratios
under normal water year conditions...



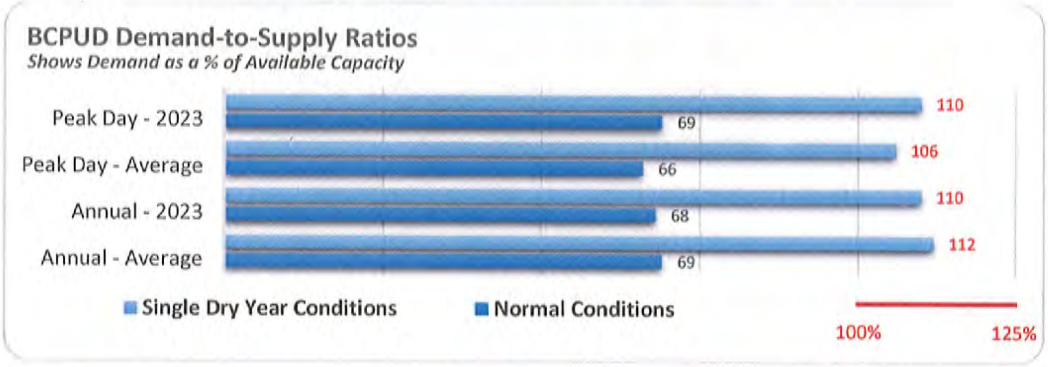
Under single dry-year conditions demand-to-supply ratios show moderate to significant system stresses for five of the seven service areas either now and/or going forward to 2023 with respect to annual and peak-day capacity measurements. These agencies with one or more measured supply deficits are BCPUD, MBCSD, SBCWD, MMWD, and NMWD-Novato. Agencies with the most negative demand-to-supply ratios of the four categories measured by the Commission are BCPUD and MMWD; both of which are also the only two agencies with current negative annual deficits. Also of note MBCSD's current ratio in meeting peak-day demands is in a current deficit of more than (200%) and is projected to rise to nearly (300%) by 2023

Five of the seven service areas – BCPUD, MBCSD, SBCWD, MMWD, and NMWD-Novato – have one or more negative demand-to-supply ratios under single dry-year conditions to match 1977.



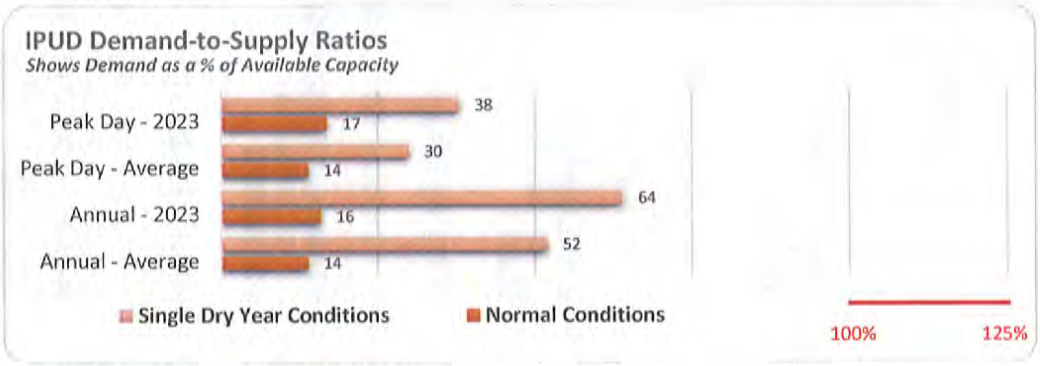
Bolinas Community Public Utility District

BCPUD's water system currently operates with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions now and going forward through 2023 timeframe – albeit at low levels compared to other agencies with the corresponding ratios all approaching 70% capacity. Demand-to-supply ratios significantly increase during projected single dry-year conditions (1977) now and going forward with BCUPD's annual and peak-day ratios all exceeding 100%.



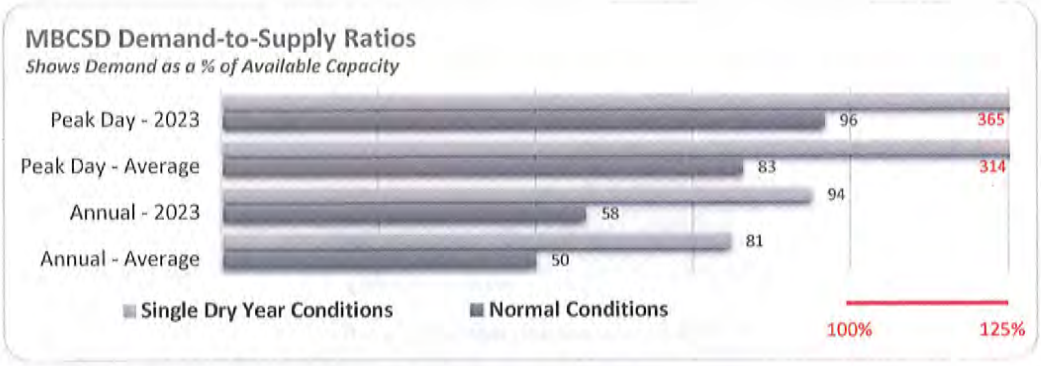
Inverness Public Utility District

IPUD's water system currently operates with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions through the 2023 timeframe with the corresponding ratios all falling under 18% capacity. Demand-to-supply ratios under projected single dry-year conditions (1977) also fall within capacity and do not exceed 64%.



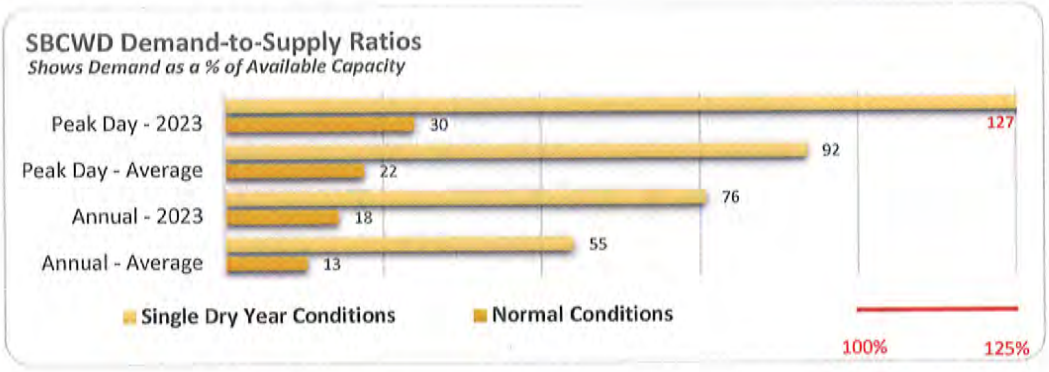
Muir Beach Community Services District

MBCSD's water system is currently operating with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions through 2023 timeframe with the corresponding measurements falling under 60% of capacity. Demand-to-supply ratios, however, significantly increase during projected single dry-year conditions (1977) now and going forward with annual totals approaching capacity and peak-day totals exceeding 300% capacity.



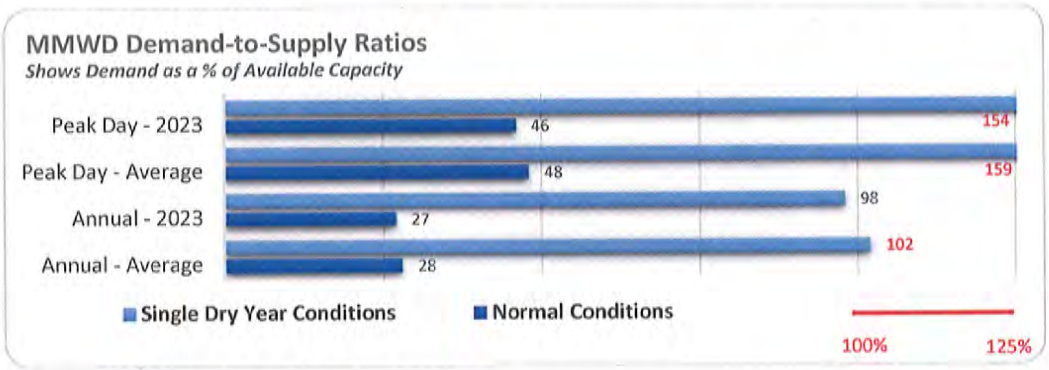
Stinson Beach County Water District

SBCWD's water system currently operates with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions through the 2023 timeframe with the corresponding ratios all falling under 30% capacity. Demand-to-supply ratios significantly increase during projected single dry-year conditions (1977) now and going forward with annual totals approaching 80% capacity and peak-day totals exceeding 120% capacity by 2023.



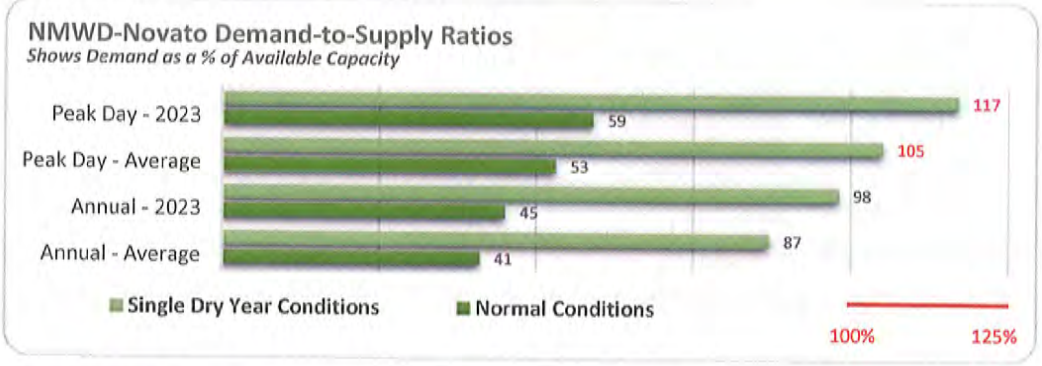
Marin Municipal Water District

MMWD's water system is currently operating with available potable relative to existing annual and peak-day demand averages from the study period under normal conditions through the 2023 timeframe with the corresponding measurements falling under 30% of capacity. Peak-day demands under normal conditions also fall within capacity and fall below 50%. Demand-to-supply ratios significantly increase during projected single dry-year conditions (1977) now and going forward with annual demands at capacity and peak-day demands exceeding capacity up to 160%.



North Marin Water District – Novato

NMWD-Novato's water system is currently operating with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions through the 2023 timeframe with the corresponding measurements all falling under 60% of capacity. Demand-to-supply ratios significantly increase during projected single dry-year conditions (1977) now and going forward with annual demands at capacity and peak-day demands exceeding capacity up to 120%.



North Marin Water District – Point Reyes Station

NMWD-Point Reyes Station's water system is currently operating with available potable supplies relative to existing annual and peak-day demand averages from the study period under normal conditions through the 2023 timeframe with the corresponding measurements falling under 40% of capacity. Peak-day demands under normal conditions also fall within capacity and below 80%. Demand-to-supply ratios rise during projected single dry-year conditions (1977) now and going forward with annual demands increasing to 50% and peak-day demands to 80%.



2.0 Treatment Capacities to Demands

The six affected agencies' treatment facilities and/or contracts therein have the collective capacity to deliver up to 86.7 million gallons or 266.3 acre-feet of potable water each day within their seven service areas.[40] This total delivery amount equals 81.3% of the projected and maximum amount of accessible daily raw water supplies available by right, permit, or contract to the six agencies under normal conditions. This

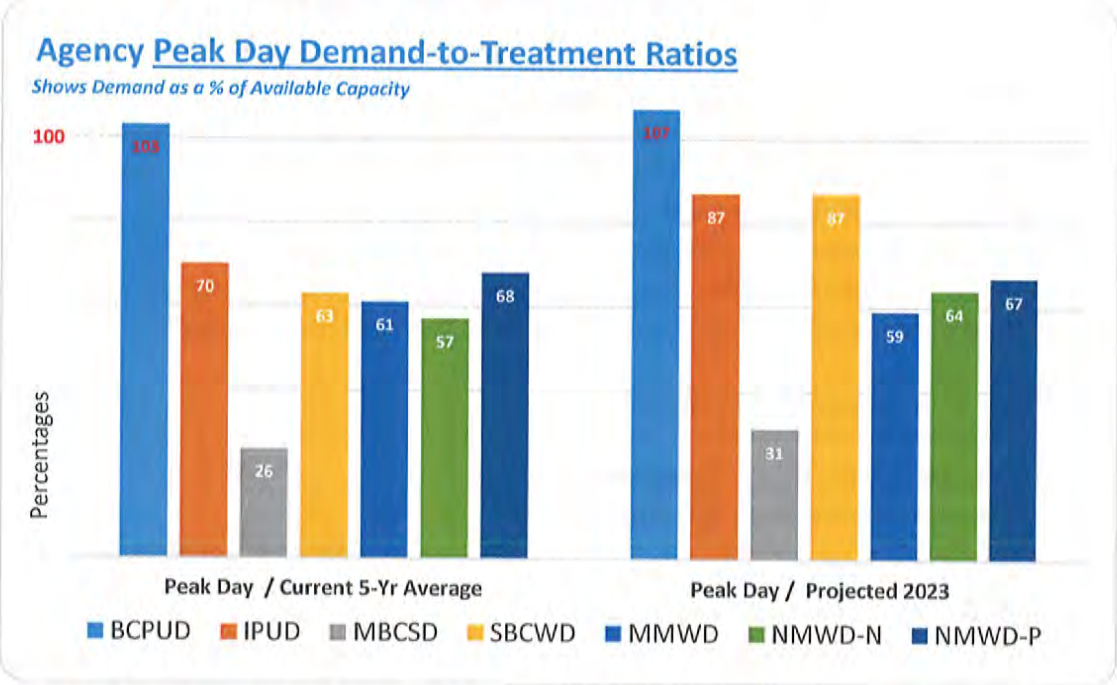
The six affected agencies have the collective capacity to treat and deliver up to 266 acre-feet of potable supplies to their seven service areas; an amount that surpasses the combined agency average peak-day demand of 159 acre-feet and results in 40% of available capacity.

[40] This total amount incorporates NMWD-Novato's contract for treated potable supplies from SCWA. MMWD also contract SCWA, but treats its potable deliveries to add fluoride at its Ignacio Treatment Facility.

total delivery amount, separately, accommodates the current five-year average peak-day demand within the seven service areas – 159.1 acre-feet – with an additional 40% of overall remaining capacity. This latter ratio is expected to remain relatively unchanged going forward to 2023.

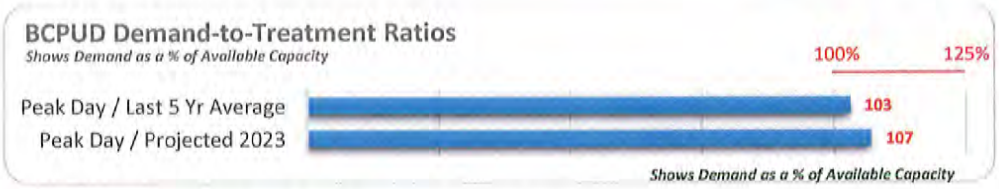
Nearly all of the six affected agencies have existing treatment capacities and/or contracts therein to accommodate their current five-year average peak-day demands within their service areas. The lone exception involves BCPUD whose average peak-day demand over the last five-year period equals 103% of the agency's maximum daily treatment capacity and is on pace to reach 107% by 2023. The remaining agencies' existing average peak-day demand-to-treatment capacity ratios range from 26% (MBCSD) to 70% (IPUD). Two additional agencies – IPUD and SBCWD – are projected to near their respective daily treatment capacity by 2023.

> Only BCPUD's current five-year average peak-day demand exceeds the agency's treatment capacity. It is projected two others – IPUD and SBCWD – will near their treatment capacity by 2023.



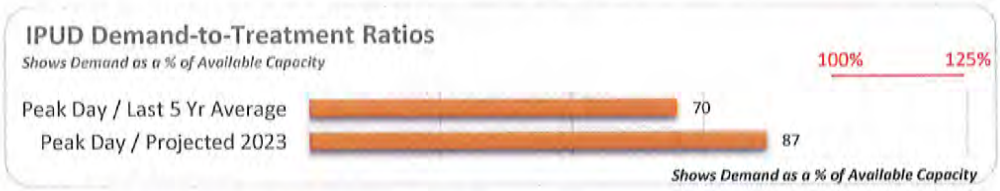
Bolinas Community Public Utility District

BCPUD's treatment facilities currently provide a maximum daily capacity of 0.70 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within BCPUD over the study period equals 102.9% and is projected to increase to 107.1% by 2023. These existing and projected ratios produces treatment capacity deficits for BCPUD ranging in intensity from (2.9%) to (7.1%) over the next 10-year period.



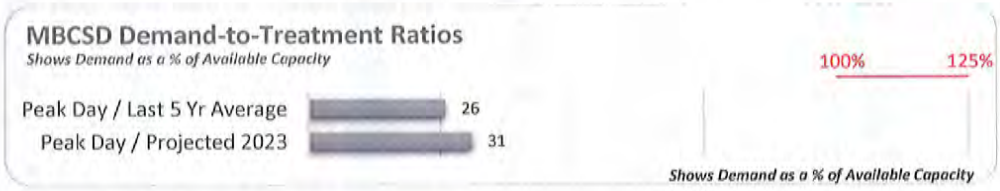
Inverness Public Utility District

IPUD's treatment facilities currently provide a maximum daily capacity of 0.53 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within IPUD over the study period equals 69.8% and is projected to increase to 86.8% by 2023. These existing and projected ratios produces treatment capacity surpluses for IPUD ranging in intensity from 13.2% to 30.2% over the next 10-year period.



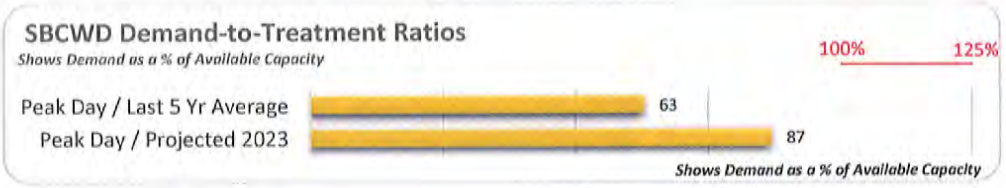
Muir Beach Community Services District

MBCSD's treatment facilities currently provide a maximum daily capacity of 0.44 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within MBCSD over the study period equals 26.4% and is projected to increase to 30.7% by 2023. These existing and projected ratios produces treatment capacity surpluses for MBCSD ranging in intensity from 69.3% to 73.6% over the next 10-year period.



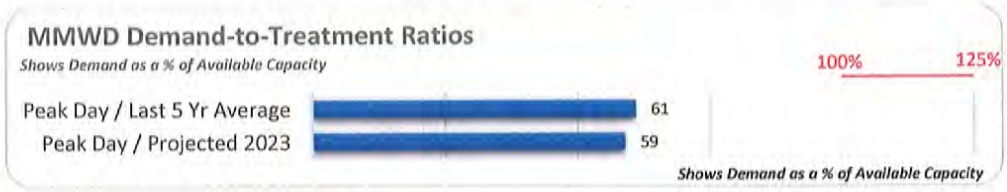
Stinson Beach County Water District

SBCWD's treatment facilities currently provide a maximum daily capacity of 1.19 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within SBCWD over the study period equals 63.0% and is projected to increase to 87.4% by 2023. These existing and projected ratios produces treatment capacity surpluses for SBCWD ranging in intensity from 12.6% to 37.0% over the next 10-year period.



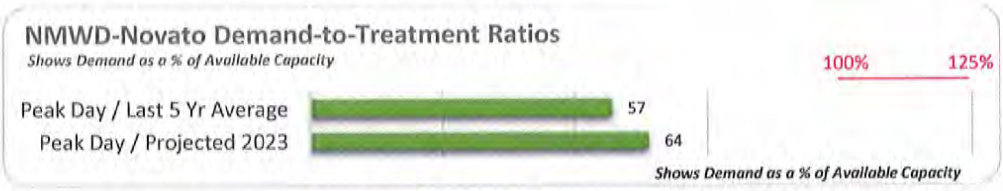
Marin Municipal Water District

MMWD's treatment facilities currently provide a maximum daily capacity of 181.0 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within MMWD over the study period equals 60.6% and is projected to decrease to 58.7% by 2023. These existing and projected ratios produces treatment capacity surpluses for MMWD ranging in intensity from 39.4% to 41.3% over the next 10-year period.



North Marin Water District – Novato

NMWD-Novato's treatment facilities and related contracted supplies therein currently provide a maximum daily capacity of 80.3 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within the Novato system over the study period equals 57.4% and is projected to increase to 64.2% by 2023. These existing and projected ratios produces treatment capacity surpluses for the Novato system ranging in intensity from 35.8% to 42.8% over the next 10 year period.



North Marin Water District – Point Reyes Station

NMWD-Point Reyes Station's treatment facilities currently provide a maximum daily capacity of 2.1 acre-feet of potable supplies for delivery into the distribution system if run continuously. The average peak-day demand to treatment ratio within the Point Reyes Station system over the study period equals 67.8% and is projected to slightly decrease to 66.8% by 2023. These existing and projected ratios produces treatment capacity surpluses for the Point Reyes Station system ranging in intensity from 32.2% to 33.2% over the next 10 year period.



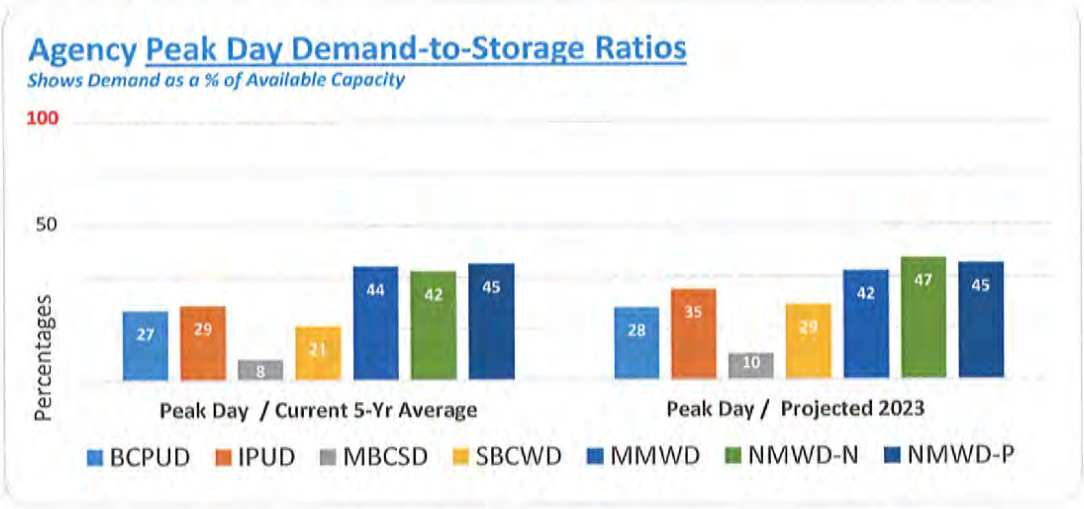
3.0 Storage Capacities to Demands

The six affected agencies' potable storage facilities have the collective capacity to hold up to 121.7 million gallons or 373.5 acre-feet within their seven service areas. This total storage amount accommodates the current study period average peak-day demand within the seven service areas – 159.1 acre-feet – with an additional 61% of overall remaining capacity for future use. This total amount also translates to a collective storage capacity to accommodate up to 2.3 days of consecutive peak-demand usage without system replenishment and the result of a wide range among the seven service areas. This latter measurement is expected to remain relatively unchanged through the 2023 timeframe.

> The six affected agencies have the collective capacity to store up to 373 acre-feet of potable supplies within their seven service areas; an amount that surpasses the combined agency average peak-day demand of 159 acre-feet and provides 2.3 days of continuous supply without system replenishment.

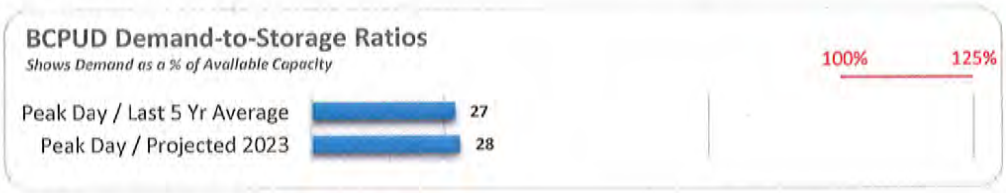
All six affected agencies have existing storage capacities to accommodate their current study period average peak-day demands within their respective service areas. None of the agencies exceed 50% capacity with the current peak day demand-to-storage ratios range between 8% (MBCSD) to 45% (NMWD-Point Reyes Station) with no significant changes projected over the next 10-year period. However, three of the seven service areas have less than three days of potable storage capacity to meet continuous peak-day demands – such as a summer-time fire incident – without recharge. The agencies with less than three days of continuous peak-demand storage are NMWD-Point Reyes Station at 2.2, MMWD at 2.3, and NMWD-Novato at 2.4.

> All seven service areas have sufficient storage to meet their average peak-day demand totals over the study period. Only three service areas – NMWD-PRS, MMWD, and NMWD-Novato – have less than three days of continuous storage to meet peak-day demands without recharge.



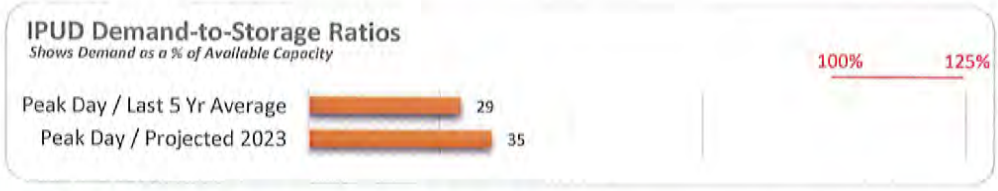
Bolinas Community Public Utility District

BCPUD's storage facilities currently provide a maximum holding capacity of 2.68 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within BCPUD over the study period equals 26.9% and is projected to increase to 28.0% by 2023. These existing and projected ratios produces storage capacity surpluses for BCPUD ranging in intensity from 72.0% to 73.1% over the next 10-year period. These latter ratios presented differently produce an average of 3.7 to 3.6 days of storage capacity to continuously meet peak-day demands without system recharge.



Inverness Public Utility District

IPUD's storage facilities currently provide a maximum holding capacity of 1.30 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within IPUD over the study period equals 28.5% and is projected to increase to 35.4% by 2023. These existing and projected ratios produces storage capacity surpluses for IPUD ranging in intensity from 64.6% to 71.5% over the next 10-year period. These latter ratios presented differently produce an average of 3.5 to 2.8 days of storage capacity to continuously meet peak-day demands without system recharge.



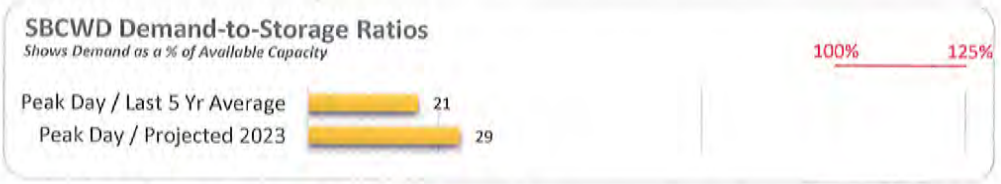
Muir Beach Community Services District

MBCSD's storage facilities currently provide a maximum holding capacity of 1.38 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within MBCSD over the study period equals 8.4% and is projected to increase to 9.8% by 2023. These existing and projected ratios produces storage capacity surpluses for MBCSD ranging in intensity from 90.2% to 91.6% over the next 10-year period. These latter ratios presented differently produce an average of 11.9 to 10.2 days of storage capacity to continuously meet peak-day demands without system recharge.



Stinson Beach County Water District

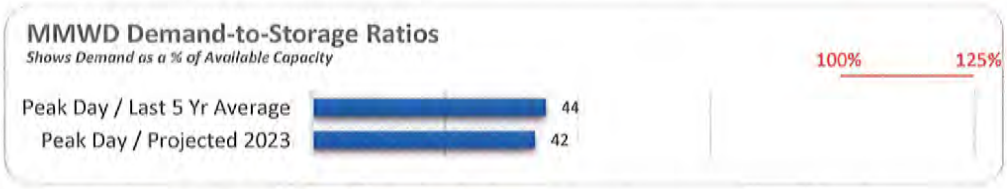
SBCWD's storage facilities currently provide a maximum holding capacity of 3.64 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within SBCWD over the study period equals 20.6% and is projected to increase to 28.6% by 2023. These existing and projected ratios produces storage capacity surpluses for SBCWD ranging in intensity from 71.4% to 79.4% over the next 10-year period. These latter ratios presented differently produce an average of 4.9 to 3.5 days of storage capacity to continuously meet peak-day demands without system recharge.



Marin Municipal Water District

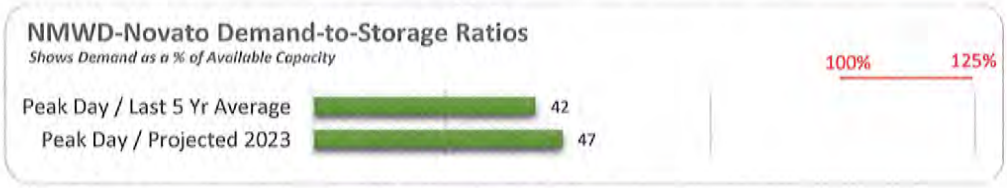
MMWD's storage facilities currently provide a maximum holding capacity of 250.9 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within MMWD over the study period equals 43.7% and is projected to decrease to 42.3% by 2023. These existing and projected ratios produces storage capacity surpluses for MMWD ranging in intensity from 56.3% to 57.7% over the next 10-year period. These latter ratios presented differently produce

an average of 2.3 to 2.4 days of storage capacity to continuously meet peak-day demands without system recharge.



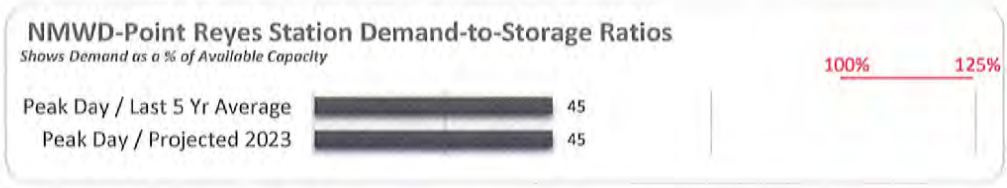
North Marin Water District – Novato

NMWD-Novato's storage facilities currently provide a maximum holding capacity of 110.4 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within the Novato system over the study period equals 41.8% and is projected to increase to 46.6% by 2023. These existing and projected ratios produces storage capacity surpluses for the Novato system ranging in intensity from 53.4% to 58.2% over the next 10-year period. These latter ratios presented differently produce an average of 2.4 to 2.1 days of storage capacity to continuously meet peak-day demands without system recharge.



North Marin Water District – Point Reyes Station

NMWD-Point Reyes Station's storage facilities currently provide a maximum holding capacity of 3.2 acre-feet of potable supplies within the distribution system. The average peak-day demand to storage ratio within Point Reyes Station over the study period equals 45.3% and is projected to slightly decrease to 44.7% by 2023. These existing and projected ratios produces storage capacity surpluses for the Point Reyes Station ranging in intensity from 54.7% to 55.3% over the next 10-year period. These latter ratios presented differently produce an average of 2.2 days of storage capacity to continuously meet peak-day demands without system recharge.



4.3 FINANCIAL

A. Direct Costs to Customers

All six affected agencies providing potable water services in Marin County largely rely on two separate charges to fund day-to-day operations as well as basic system improvements within their seven service areas with some variance in terms of structure or purpose. All seven service areas' primary funding charge are user – or quantity – fees and generally finance day-to-day operations and are applied to actively served parcels. User charges for all seven service areas are currently in tier-format and apply an escalating rate based on metered consumption and billed monthly, bimonthly, or quarterly. The second prominent fee is an availability – or basic – charge that applies to all jurisdictional parcels irrespective of active service and typically funds baseline improvements and generally accounts for a quarter of all operating revenues.

The current average weighted residential cost for potable water service within all seven service areas as of January 2015 is $0.78 for every 100 gallons.[41] This average produces a similarly weighted annual residential household cost of $1,175.[42]

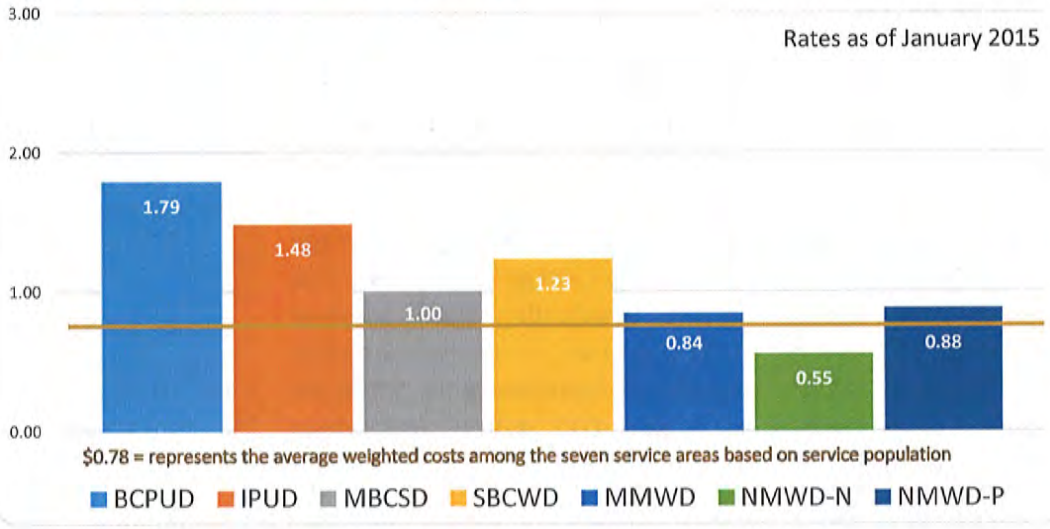
The current average weighted residential cost for potable water service based on rates as of January 2015 within all seven service areas is $0.78 for every 100 gallons, and translates to a weighted annual cost of $1,175 based on consumption rates over the study period.

Individual service area charges for potable water service ranges from a low of $0.55 for NMWD-Novato to a high of $1.79 for BCPUD for every 100 metered gallons; a range difference of over 225%. As expected potable charges in East Marin are significantly lower than charges in West Marin and presumably aided by the regions differences in economies of scale and ability to spread costs out among users.

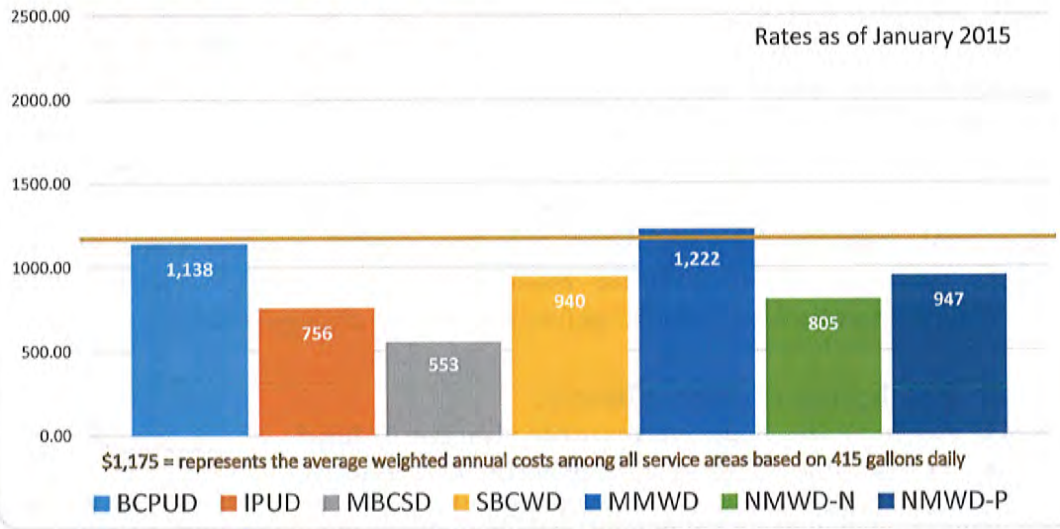
[41] The weighted calculation producing the $0.78 per 100 gallons is based on summing and dividing all seven service area charges (user and availability) and multiplied by their respective share of overall population percentages.

[42] The weighted calculation producing an annual residential household cost of $1,175 is based on a per residential user daily gallon use of 415 gallons.

Average Residential Household Costs for Potable Water / Every 100 Gallons Among Agencies



Average Residential Household Costs for Potable Water / Annual Totals Among Agencies



Bolinas Community Public Utility District

BCPUD relies on two separate charges to fund the District's potable water system in terms of operating and improvements: (a) user and (b) availability charges. The user charge was last updated in 2009 with current average meter uses producing a quarterly bill of $30. The

The current average residential cost for potable water service based on recent usage within BCPUD is $1,138 and produces $1.79 per 100 gallons, which represent the highest total among public service providers in Marin County

availability fee was last updated in 2011 and is an annual flat rate service charge of $1,018 and collected on the property tax bill. The cumulative cost for most BCPUD residential customers is $1,138 annually and results in a per 100 gallon equivalent charge of $1.79.

Inverness Public Utility District

IPUD relies on two separate charges to fund the District's potable water system in terms of operating and improvements: (a) user and (b) basic charges. The user charge was last updated in 2009 with current average meter uses producing a bimonthly charge of $25.94. The basic charge serves as an availability and applied bimonthly at a flat $100.00 amount. The cumulative cost for most IPUD residential customers is $755.64 annually and results in a per 100 gallon equivalent charge of $1.48.

The current average residential cost for potable water service based on recent usage within IPUD is $756 and produces $1.48 per 100 gallons.

Muir Beach Community Services District

MBCSD relies on two distinct charges and fees to fund the District's water system in terms of operating and improvements: (a) bi-monthly user charge and (b) semi-annual fee for water capital improvements. The user charge was last updated by the Board in 2013 with current average meter uses producing a bimonthly charge of $92.24. The semi-annual capital improvement fee collects $300 and $3,250 each year on the assessment roll for all residential and non-residential connections, respectively, and used only for capital improvements to the water system. The cumulative cost for most MBCSD residential customers is $533 annually and results in a per 100 gallon equivalent charge of $1.00.

The current average residential cost for potable water service based on recent usage within MBCSD is $533 and produces $1.00 per 100 gallons.

Stinson Beach County Water District

SBCWD relies on two separate monthly charges to fund the District's potable water system in terms of operating and improvements: (a) user and (b) availability charges. The user charge was last updated in 2010 with current average meter uses producing a monthly charge of $39.78. The availability fee is based on meter size with most residential customers receiving a flat monthly charge of $38.55. The cumulative cost for most residential customers for water service is $940 annually and results in a per 100 gallon equivalent charge of $1.23.

The current average residential cost for potable water service based on recent usage within SBCWD is $940 and produces $1.23 per 100 gallons.

Marin Municipal Water District

MMWD primarily relies on two distinct billed bi-monthly charges to fund the District's potable water system in terms of covering both administrative and operations: (a) service and (b) usage. The service charge is fixed based on meter size and presently assigns a bi-monthly charge of $21.53 for most single-family residential users. The usage charge is tiered and adjusts seasonally based on usage occurring either between December and May (lower demand) or June and November (higher demand). The usage charge currently results in the average residential customer paying $164.56 bi-monthly between December and November and $199.71 bi-monthly between June and November. The cumulative annual cost for most MMWD residential customers is $1,222 and results in a per 100 gallon equivalent charge of $0.84.

The current average residential cost for potable water service based on recent usage within MMWD is $1,222 and produces $0.84 per 100 gallons.

North Marin Water District – Novato

NMWD primarily relies on two distinct billed bi-monthly charges to fund the District's water system within the Novato system in terms of covering both improvements and operations: (a) service and (b) quantity. The service charge was last updated in 2013 and presently assigns a bi-monthly charge of $30 for most users. The quantity charge was last updated in 2014 and currently results in the average residential customer paying $134.13 for every two-month billing cycle. The cumulative cost for most NMWD customers in the Novato system is $805 annually and results in a per 100 gallon equivalent charge of $0.55.

The current average residential cost for potable water service based on recent usage within NMWD's Novato system is $805 and produces $0.55 per 100 gallons; both of which represent the lowest totals among public service providers in Marin County.

North Marin Water District – Point Reyes

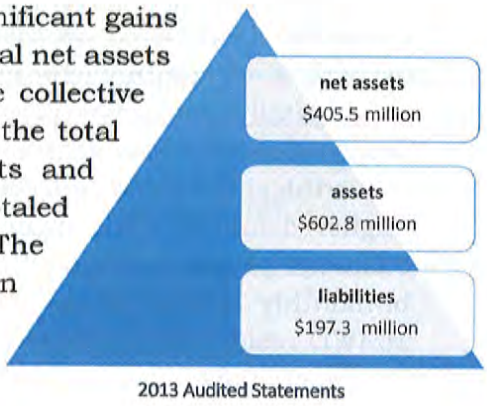
NMWD primarily relies on two distinct billed bi-monthly charges to fund the District's water system within the Point Reyes Station system in terms of covering both improvements and operations: (a) service and (b) quantity. The service charge was last updated in 2013 and presently assigns a bi-monthly charge of $30 for most users. The quantity charge was last updated in 2014 with current meter uses producing a bimonthly charge of $157.88. The cumulative costs for most Point Reyes Station customers is $947 annually and results in a per 100 gallon equivalent charge of $0.88.

The current average residential cost for potable water service based on recent usage within NMWD's Point Reyes system is $947 and produces $0.88 per 100 gallons.

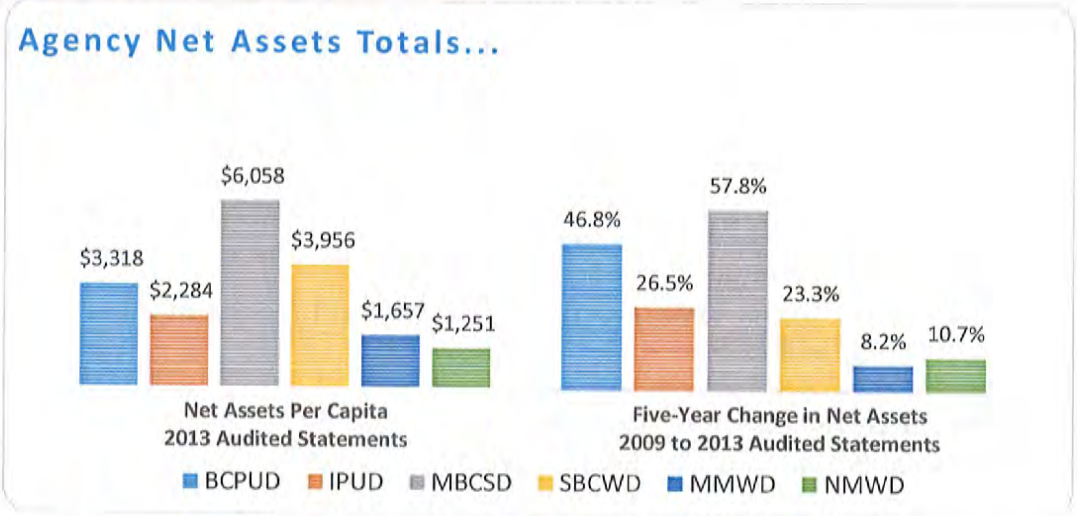
B. Agency Standing

1.0 Net Assets / Unrestricted Fund Balances

All six affected agencies experienced moderate to significant gains in their overall financial standing as measured by total net assets or equity during the course of study period. The collective increase in the six agencies combined net assets – the total difference between current and non-current assets and liabilities – over the corresponding five-year period totaled $35.4 million and represents a difference of 9.6%.[43] The most recent combined year-end total - $405.5 million – represents a per capita net asset amount of $1,591 with over one-tenth – or 13.8% – categorized as unrestricted and can be used for any purposes.



Individual changes in net assets among the six affected agencies over the study period ranged from a low of 8.2% from MMWD to a high of 57.5% from MBCSD with the latter agency also having the highest per capita ratio of net assets at $6,058.



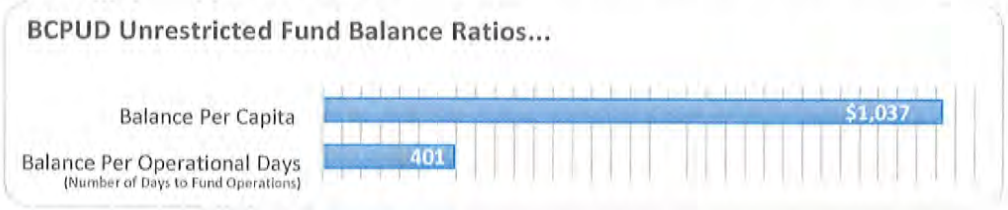
Bolinas Community Public Utility District

BCPUD's audited net assets at the end of the study period totaled $5.223 million. This amount has increased by nearly one-half or 46.8% over the five previous fiscal years and primarily attributed to continued operating surpluses coupled with reduction in liabilities and resulting increase in

BCPUD's unrestricted fund balance total of $1.633 million at the end of the study periodequates to a per capita amount of $1,037.

[43] MBCSD issues unaudited financial statements prepared by a contract accountant.

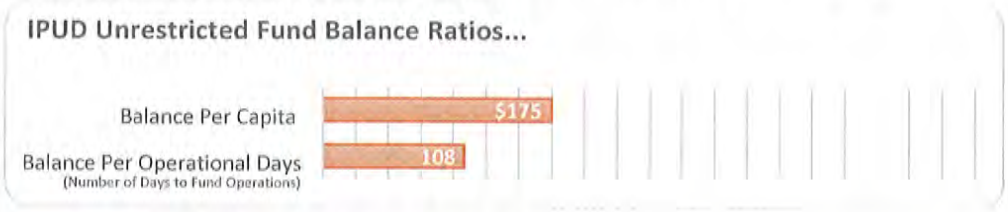
capital assets. The end of year amount includes $1.633 million in unrestricted funds that has increased by 72.5% over the preceding five-year period and equates to a per capita amount of $1,037. The unrestricted balance also equates to providing BCPUD funding to cover up to 401 days based on adopted operating expenses.



Inverness Public Utility District

IPUD's audited net assets at the end of the study period totaled $3.141 million. This amount has increased by slightly over one-fourth or 26.6% over the five previous fiscal years and primarily attributed to continued operating surpluses coupled with the reduction in liabilities. The end of year net asset amount includes $0.241 million in unrestricted funds that has decreased by (84.1%) over the preceding five-year period and equates to a per capita amount of $175. The unrestricted balance also equates to providing IPUD funding to cover up to 108 days based on adopted operating expenses.

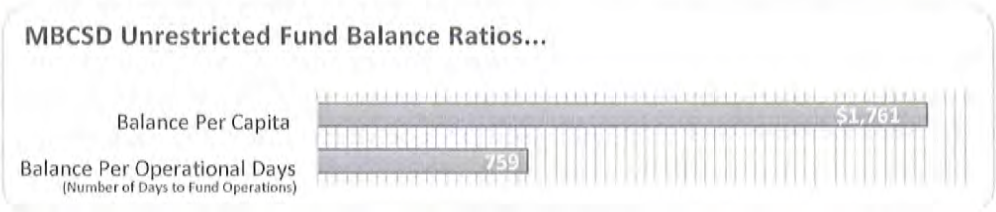
IPUD's unrestricted fund balance total of $0.241 million at the end of the study period equates to a per capita amount of $175.



Muir Beach Community Services District

MBCSD's unaudited net assets at the end of the study period totaled $2.611. This amount has increased by over one-half or 57.5% over the five previous fiscal years and primarily attributed to collection of funds – including nearly $0.350 in private donations – for water capital improvements. The end of year amount also includes $0.759 million in unrestricted funds that has decreased by (20.0%) over the preceding five-year period and results in a per capita ratio of $1,761. The unrestricted balance also equates to providing MBCSD funding to cover up to 759 days based on adopted operating expenses.

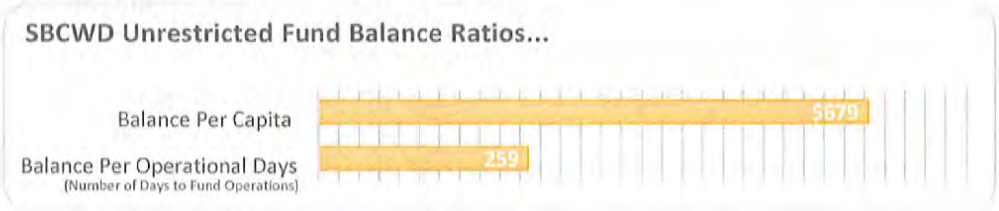
MBCSD's unrestricted fund balance total of $0.759 million at the end of the study period equates to a per capita amount of $1,761.



Stinson Beach County Water District

SBCWD's audited net assets at the end of the study period totaled $5.070 million. This amount has increased by nearly one-fourth - or 23.3% - over the five previous fiscal years. The end of year amount also includes $1.330 million in unrestricted funds that has decreased by (20.3%) over the preceding five-year period and results in a per capita ratio of $679. The unrestricted balance also equates to providing SBCWD funding to cover up to 259 days based on adopted operating expenses.

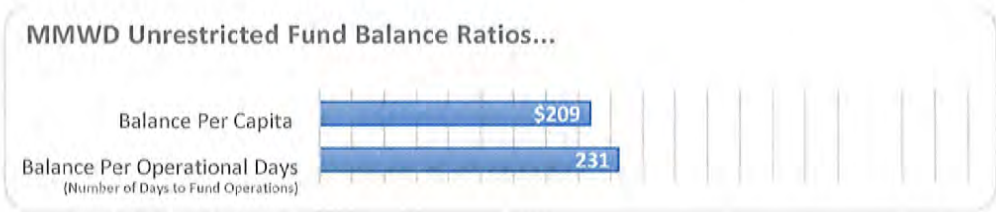
SBCWD's unrestricted fund balance total of $1.3 million at the end of the study period equates to a per capita amount of $679.



Marin Municipal Water District

MMWD's audited assets at the end of the study period totaled $308.346 million. The total amount has increased almost one-tenth - or 8.2% - over the preceding five year period. The end of year also amount also incorporates a $38.923 million balance in unrestricted funds that has increased by 13.9% over the preceding five-year period and results in a per capita ratio of $209. The unrestricted balance also equates to providing MMWD funding to cover up to 231 days based on adopted operating expenses.

MMWD's unrestricted fund balance total of $38.9 million at the end of the study period equates to a per capita reserve amount of $209



North Marin Water District

NMWD's audited net assets at the end of the study period totaled $81.097 million. This amount has increased by just over ten percent - or 10.7% - over the five previous fiscal years. The end of year equity amount also incorporates a $13.071 million in unrestricted funds that has increased by 65.0% over the preceding five-year period and results in a per capita ratio of $202. The unrestricted balance also equates to providing NMWD funding to cover up to 252 days based on adopted operating expenses for both systems.

NMWD's unrestricted fund balance total of $13.0 million at the end of the study period equates to a per capita amount of $202.



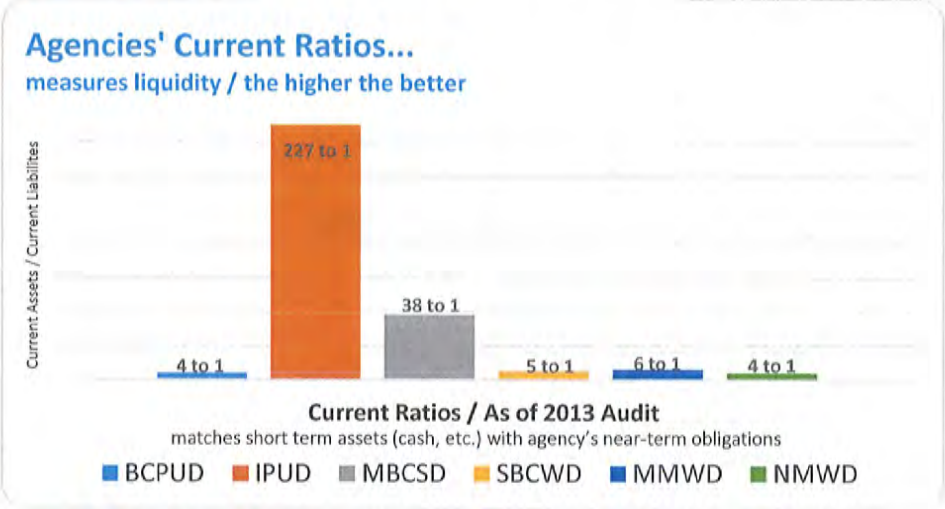
2.0 Liquidity, Capital, and Profitability

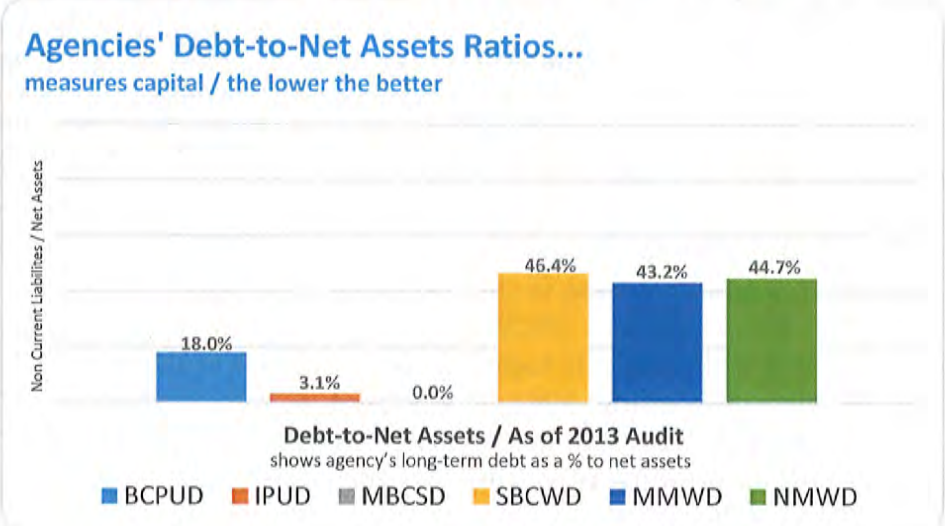
A review of the financial statements issued by all six affected agencies through the study period generally shows relatively strong ending positions with respect to liquidity (ability to address short-term obligations) and profitability (maintain positive cash flows). This includes noting all six agencies ended the review period with no less than a 4 to 1 ratio of current assets over current liabilities as well as relatively high operating margins with the lowest return – 8.6% from SBCWD – exceeding the corresponding inflation rate by more than triple in the San Francisco Bay Area region.[44] However, and in contrast to the preceding comments, half of the agencies – SBCWD, MMWD, and NMWD – finished with relatively high debt-to-net asset ratios by all approaching 50%; a standard demarcation in which agencies financial flexibility becomes restricted in funding new infrastructure needs and deficiencies due to existing debt levels.

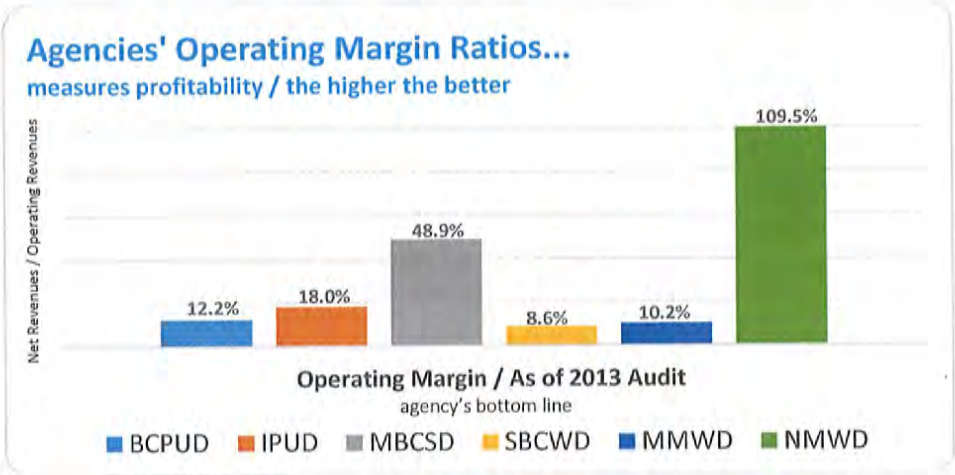
All six affected agencies finished the five-year review period in generally good position with respect to liquidity and profitability with all finishing with current ratios of no less than 4 to 1 and operating margins that exceed local inflation rates. Three of the agencies – SCBWD, MMWD, and NMWD – however finished with relatively high debt ratios that approach 50% of their respective net assets.

[44] The consumer price index from 2012 and 2013 increased by 2.7% within the San Francisco Bay Area region according to the United States Bureau of Labor Statistics.

Trends among individual agencies over the study period has significantly varied with respect to measuring liquidity, capital, and margin; i.e., the agencies' financial standing has stayed dynamic and generally changed from year-to-year. The most dynamic measurement has involved debt-to-net assets ratios with five of the six agencies – BCPUD, IPUD, SBCWD, MMWD, and NMWD – all experiencing more than one-third changes (increases and decreases) over the preceding five-year period. Operating margins have also been dynamic with three of the agencies – IPUD, MBCSD, and SBCWD – all generating increases of more than 100%.

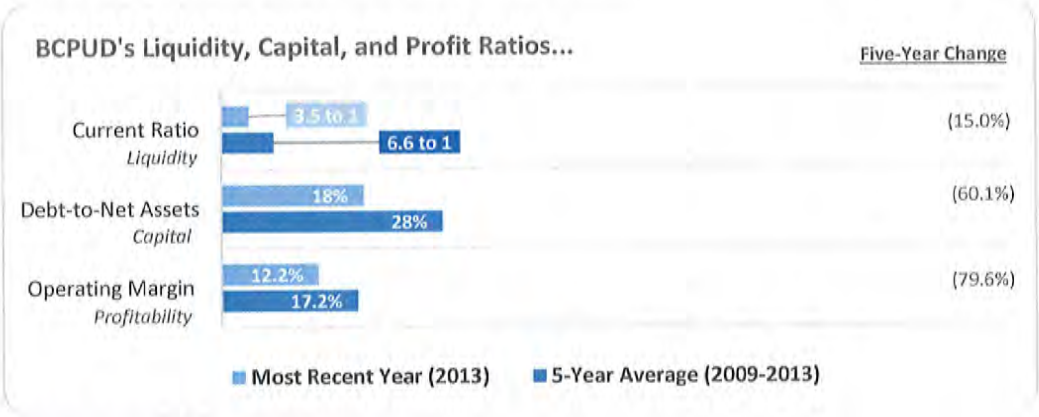






Bolinas Community Public Utility District

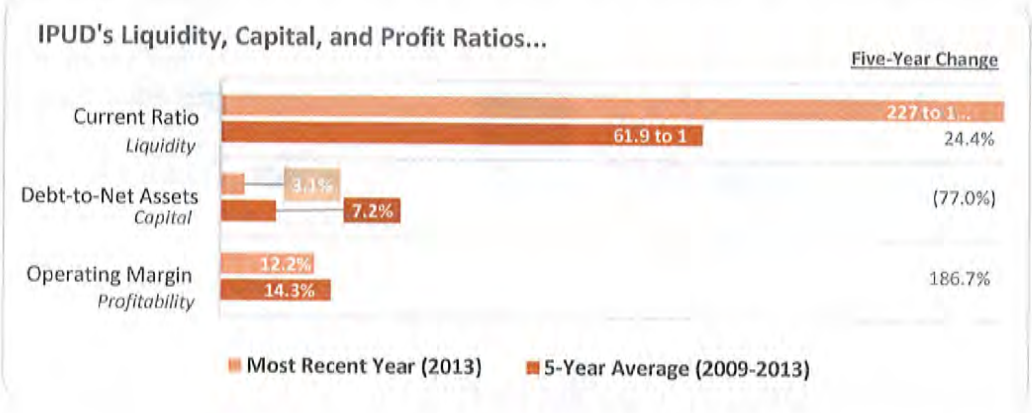
BCPUD's five-year averages during the course of the study period showed the District finished with relatively good liquidity and better capital and profit ratios despite experiencing negative trend changes in two of the three measured categories (current ratio and operating margin). Most notably, BCPUD improved its capital standing by reducing its long-term indebtedness by over one-half over the five-year period and ending with a relatively low debt-to-net asset ratio of 18%. BCPUD's liquidity levels, in contrast, decreased by 15% over the stduy period as a result of escalating short-term debt obligations, but the District still finished the review period with current assets outpacing current liabilities by over 3 to 1.



Inverness Public Utility District

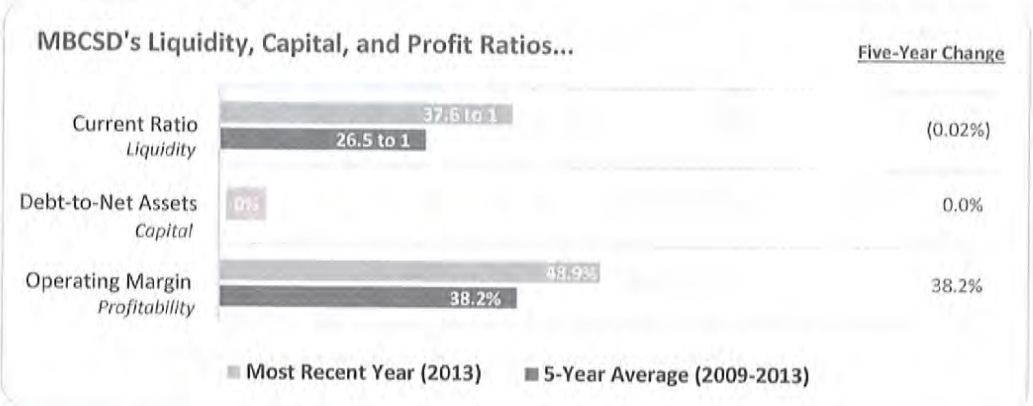
IPUD's five-year averages during the course of the study period showed the District finished with exceptionally high liquidity and good capital and profit ratios with all three measurement categories experiencing positive trend changes. This includes persistent and increasing gains in profitability with a near triple gain in operating margin as well as improved capital by reducing long term obligations by nearly four-fifths and ending with a notably low debt-to-net asset ratio of 3%. IPUD's liquidity

also remained relatively high throughout the first four years before spiking even higher to a current ratio of 227 to 1 by the final year with the near elimination of short-term obligations.



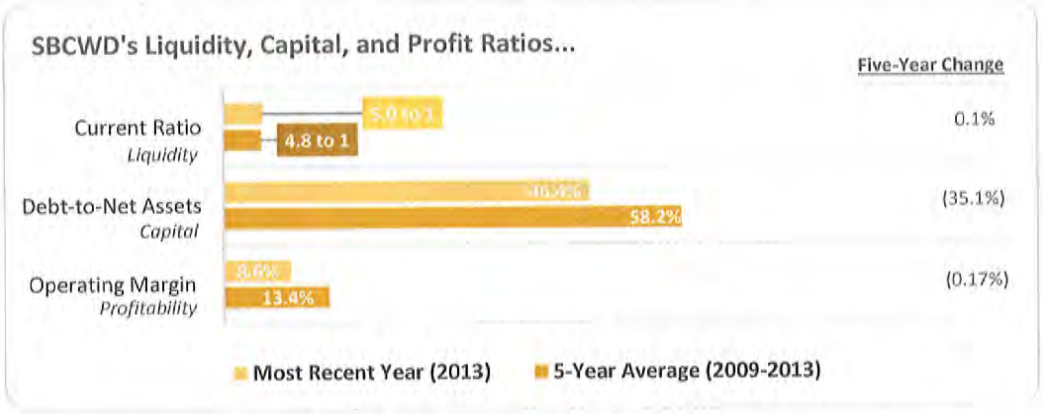
Muir Beach Community Services District

MBCSD's five-year averages during the course of the study period showed the District finished with relatively high liquidity and profit ratios as well as incurring no long-term debt. The current ratio, pertinently, averaged 26 to 1 and ended the period at 37 to 1 with the expectation MBCSD would draw down on its cash equivalents to self-fund a major water line in the near future. MBCSD also continued to improve its profitability by more than doubling its year-end net over the study period with four of the five years achieving close to a 50% operating margin.



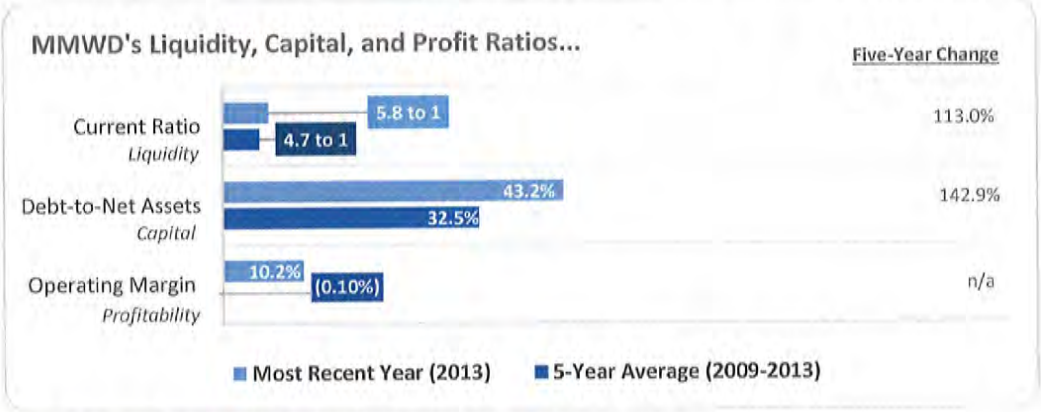
Stinson Beach County Water District

SBCWD's five-year averages during the course of the study period showed the District finished with moderate liquidity and profit ratios that remained relatively stagnant over the five-year period. This includes finishing the five-year period with a current ratio of 5 to 1 and an operating margin of 8.6%. SBCWD's long-term debt totals remained relatively high and finished with a debt-to-net assets ratio of close to 50% despite cutting over one-third during the five-year period.



Marin Municipal Water District

MMWD's five-year averages during the course of the study period showed the District finished within improved measurements with respect to liquidity and profit while concurrently experiencing a significant increase in long-term debts. This includes MMWD expanding the value of near-term assets over near-term liabilities by more than double and finishing the period with a current ratio of 5.8 to 1. MMWD also incrementally eliminated an operating deficit with the aid of the District enacting a rate increase beginning in 2012 that helped produce a final operating margin of 10.2%. MMWD did experience, though, a significant decrease in capital as a result of new long-term debt obligations and marked by increasing its debt-to-equity level by more than double and finishing the period with a debt-to-net asset ratio of 43.2%.



North Marin Water District

NMWD's five-year averages during the course of the study period showed the District finished within improved liquidity and profitability while concurrently experiencing a sharp rise in long-term debt. This includes NMWD expanding the value of near-term assets over near-term liabilities by almost 60% and finishing the review period with a current ratio of 4.3 to 1. NMWD also incrementally eliminated a persistent operating deficit by the end of the study period with the aid of the District enacting three consecutive rate increases and finishing the period within its first positive

operating margin ratio totaling 10.9%. NMWD did experience, nonetheless, a significant decrease in capital as a result of new long-term debt obligations and marked by finishing with a relatively high debt-to-equity ratio of 45%.

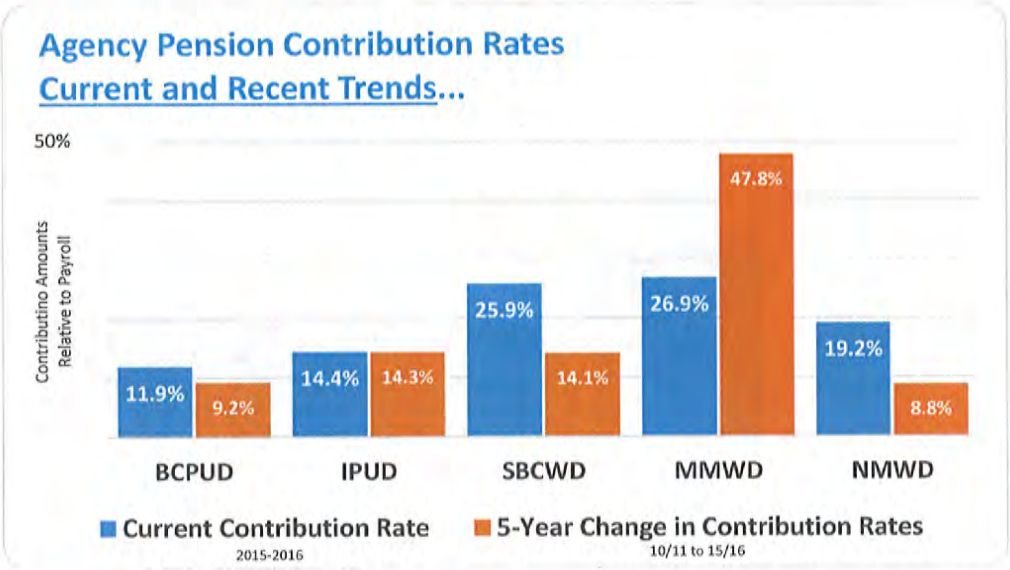


3.0 Pension Obligations

Five of the six affected agencies have contractual pension obligations with the lone exception involving MBCSD. All existing pension contracts for the five subject agencies – BCPUD, IPUD, SBCWD, MMWD, and NMWD – are with the California Public Employees' Retirement System (CalPERS) and provide relatively similar benefits to their employees. This includes providing eligible employees with retirement and disability benefits, annual cost-of-living adjustments, and death benefits to members and their beneficiaries based on the terms of the agency contracts with CalPERS. Agency funding contributions are non-discretionary and based on employee salary totals and determined each year by CalPERS through actuarial updates. All mandatory contribution rates – which are separate from any cost-sharing arraignments between the agencies and its employees – have increased between 2010 and 2015 fiscal years by an average of 18.2% and exceeds the corresponding inflation change for the region by nearly one-half with the single largest increase occurring for MMWD at 47.8%.[45]

Five of the six affected agencies – BCPUD, IPUD, SBCWD, MMWD, and NMWD – have existing pension obligations through separate contracts with CalPERS. These contracts include mandatory contributions based on annual actuarial reports prepared by CalPERS with the corresponding rate collectively increasing over the most recent five-year period (2010-2015) by an approximate 20% average.

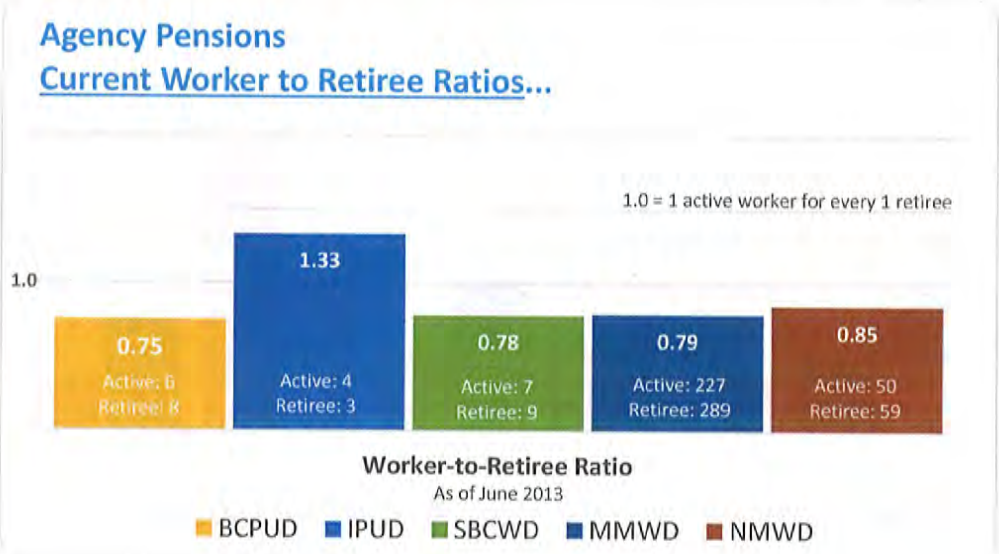
[45] The consumer price index from 2009 and 2014 increased by 12.3% within the San Francisco Bay Area region according to the United States Bureau of Labor Statistics.



All agencies maintain at least two contract tiers with CalPERS that range in defined benefits from a high of 2.7 at 55 to a low and now standard allowance byway of new State law for nearly all public agencies of 2.0 at 62; the latter providing an eligible retiree with 20 years of total service credit 40% of their highest average salary over a three year period beginning at age 62. The total number of vested employees (i.e., those with at least five years of service credit) combined between the five subject agencies is 788 with over three-fourths tied to MMWD along with a combined active-to-retiree ratio of 0.79 to 1:00 as of the end of the study period; the latter producing an overall imbalance with approximately four active employees currently contributing to the pension system for every five retired employees.[46]

> The combined active-to-retiree ratio between the five subject agencies is 0.79 to 1:00 as of the end of the study period; an amount meaning there are approximately four active employees contributing to the pension system for every five retired employees.

[46] Participant information is as of June 2013 and represents the most recent information available from CalPERS.



Actual pension contribution have increased for four of the five subject agencies based on available information spanning the 2010-2011 and 2012-2013 fiscal years; the latter of which is the most recent fiscal year published by CalPERS as of date. The combined increase over this most recent three-year period for the four subject agencies that experienced rises in pension costs – BCPUD, IPUD, SBCWD, and NMWD – totaled 19.0% or $0.206 million and nearly three times greater than the corresponding inflation rate for the San Francisco Bay Area region with the lowest individual rise equaling 13.5% (BCPUD).[47] The remaining agency – MMWD – was the only of the five experiencing an actual decrease in pension contributions over the three-year period by (9.4%) or $2.1 million due despite a parallel rise in liability as noted below and tied to an overall decrease in wages.

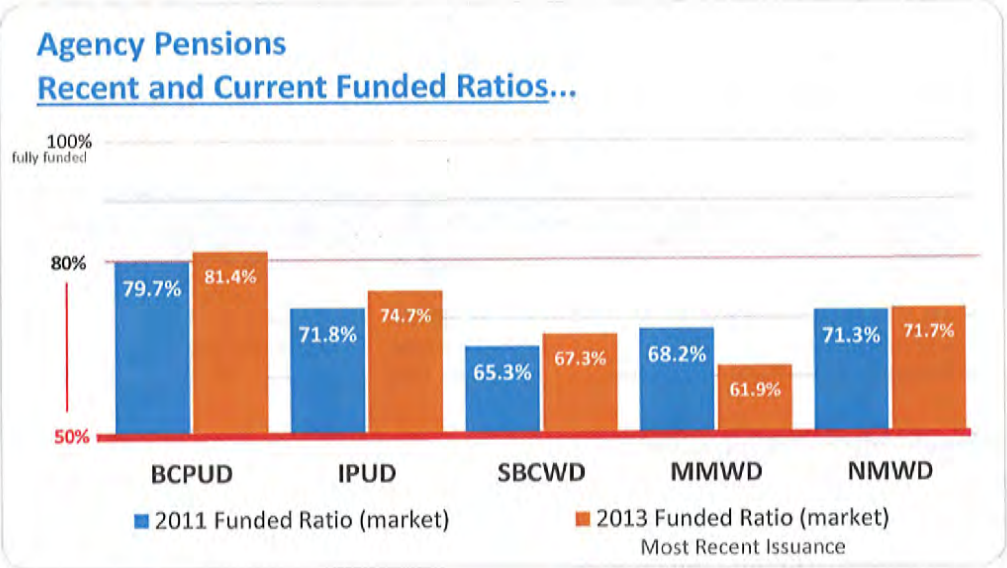
Four of the five subject agencies – BCPUD, IPUD, SBCWD, and NMWD – have experienced no less than a 13.5% increase in the actual pension costs over the last three available years of documentation (2011-2013); a change that is nearly three times greater than the corresponding inflation rate for the region.

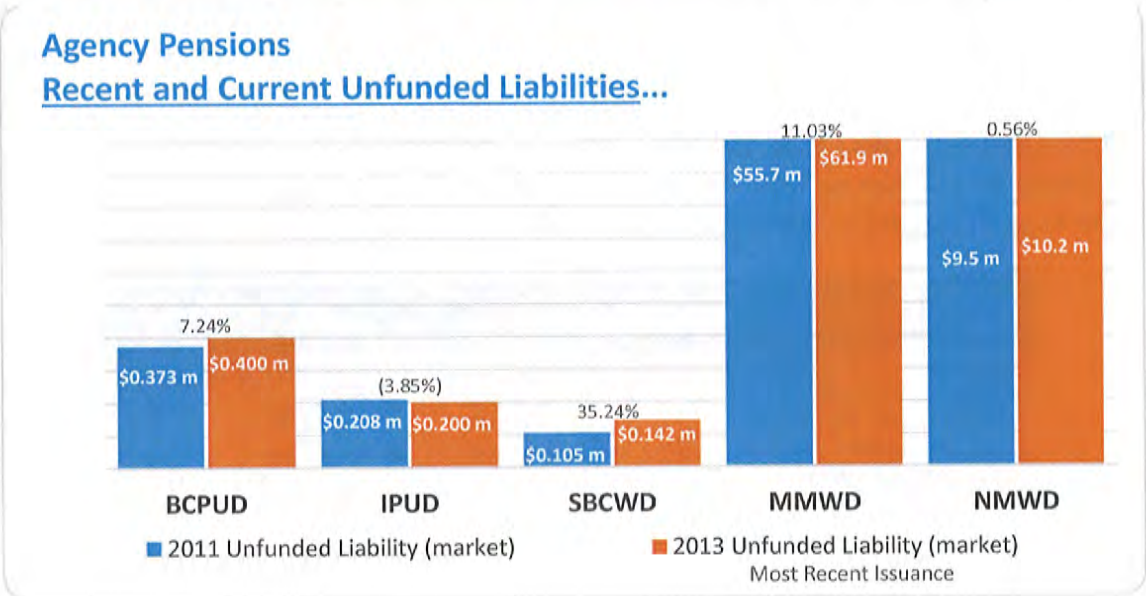
None of the five subject agencies with pension obligations are fully funded. Four of the five agencies funded status – the difference between the pension plan's assets and liabilities – also fell below the 80% standard threshold used in identifying relatively stable pension plans as of the last CalPERS report. The referenced increases in recent contributions for BCPUD, IPUD, SBCWD, and NMWD have improved these four agencies' funded status over the three-year review window, albeit modestly and proportionally less

Only BCPUD has a funded status above 80% as of the last report issuance by CalPERS; the standard threshold used in identifying relatively stable pension plans.

[47] The consumer price index from 2010 and 2013 increased by 5.0% within the San Francisco Bay Area region according to the United States Bureau of Labor Statistics.

than the rise in contributions between 0.5% to 4.0%. The most recent funded ratios for these four agencies based on market calculations ranges from a low of 67% for SBCWD to a high of 81% BCPUD.[48] MMWD's funded ratio has decreased in step with its lower contributions over the three-year window by (9.2%) and finished at 62%. The overall unfunded liability – pension monies owed that are not covered by assets – combined among all five subject agencies has increased by 10.4% or $6.8 million between 2011 and 2013 with 90% belonging to MMWD.





[48] CalPERS no longer provide actuarial calculations for funded status or unfunded liability for reporting purposes due to changes in accounting standards. Nonetheless, and as a standard planning tool based on prior estimates, it is reasonable to project actuarial calculations generally provide a five to seven point increase over market calculations.

Bolinas Community Public Utility District

BCPUD's total annual pension contributions have risen by 13.5% from $0.037 million to $0.042 million over the most recent three-year review window (2011-2013). These raised contributions have helped to modestly improve BCPUD's funded ratio by 2.1% and ended the period at 81.4% (market); the highest ratio among all five subject agencies. However, BCPUD's unfunded liability, however, also increased by 7.2% from $0.373 million to $0.400 million; an amount equal to 24.1% of the District's undesignated fund balance as of the start of 2013-2014. BCPUD's worker-to-retiree ratio finished the period at 0.75 to 1.0.

BCPUD's funded ratio has improved by 2.1% over the last three reported years finishing at 81.4%; the highest ratio among the five subject agencies.

BCPUD's Pension Obligations
Table 3-24 (Marin LAFCO / CalPERS)

Category	2010-2011	2012-2013	Difference
Annual Contribution	$0.037 million	$0.042 million	13.5%
Funded Ratio – Market	**79.7%**	**81.4%**	**2.1%**
Unfunded Liability - Market	$0.373 million	$0.400 million	7.2%
Active to Retiree Ratio	0.54	0.75	38.9

Inverness Public Utility District

IPUD's total annual pension contributions have risen by 33.3% from $0.027 million to $0.036 million over the most recent three-year review window (2011-2013). This increase in contributions has helped to moderately improve IPUD's funded ratio by 4.0% and ended the period at 74.7% (market). IPUD's unfunded liability has also correspondingly decreased by (3.8%) from $0.208 million to $0.200 million; an amount equal to 83.0% of the District's undesignated fund balance as of the start of 2013-14. IPUD's worker-to-retiree ratio finished the period at 1.3 to 1.0.

IPUD's funded ratio has improved by 4.0% over the last three reported years finishing at 74.7%; the second highest ratio among the five subject agencies.

IPUD's Pension Obligations
Table 3-25 (Marin LAFCO / CalPERS)

Category	2010-2011	2012-2013	Difference
Annual Contribution	$0.027 million	$0.036million	33.3%
Funded Ratio – Market	**71.8%**	**74.7%**	**4.0%**
Unfunded Liability - Market	$0.208 million	$0.200 million	(3.8%)
Active to Retiree Ratio	1.7	1.3	(23.5%)

Stinson Beach County Water District

SBCWD's total annual pension contributions have risen by 35.2% from $0.105 million to $0.142 million over the most recent three-year review window (2011-2013). This increase in contributions has helped to moderately improve SBCWD's funded ratio by 3.1% and ended the period at 67.3%. SBCWD's unfunded liability nonetheless also increased by 6.5% from $1.086 million to $1.157 million; an amount equal to 87.0% of the District's undesignated fund balance as of the start of 2013-2014. SBCWD's worker-to-retiree ratio finished the period at 0.77 to 1.00.

SBCWD's funded ratio has improved by 3.1% over the last three reported years finishing at 67.3%; the lowest ratio among the five subject agencies.

SBCWD's Pension Obligations
Table 3-26 (Marin LAFCO / CalPERS)

Category	2010-2011	2012-2013	Difference
Annual Contribution	$0.105 million	$0.142 million	35.2%
Funded Ratio – Market	**65.3%**	**67.3%**	**3.1%**
Unfunded Liability - Market	$1.086 million	$1.157 million	6.5%
Active to Retiree Ratio	1.0	0.77	(23.0%)

Marin Municipal Water District

MMWD's total annual pension contributions have decreased by (9.4%) from $22.3 million to $20.2 million over the most recent three-year review window (2011-2013). This decrease in contributions has contributed to MMWD's funded ratio slightly lowering by (0.9%) and ended the period at 67.6%. MMWD's unfunded liability also increased by 10.9% from $55.7 million to $61.9 million; an amount equal to 159% of the District's undesignated fund balance as of the start of 2013-2014. MMWD's worker-to-retiree ratio finished the period at 0.78 to 1.00.

MMWD's funded ratio has declined by (0.9%) over the last three reported years finishing at 67.6%; the second lowest ratio among the five subject agencies.

MMWD's Pension Obligations
Table 3-27 (Marin LAFCO / CalPERS)

Category	2010-2011	2012-2013	Difference
Annual Contribution	$22.3 million	$20.2 million	(9.4%)
Funded Ratio – Market	**68.2%**	**67.6%**	**(0.9%)**
Unfunded Liability - Market	$55.7 million	$61.9 million	10.9%
Active to Retiree Ratio	0.93	0.78	(16.1%)

North Marin Water District

NMWD's total annual pension contributions have increased by 17% from $0.913 million to $1.068 million over the most recent three-year review window (2011-2013). This increase in contributions has helped to slightly improve NMWD's funded ratio by 0.6% and ended the period at 71.7%. NMWD's unfunded liability, however, continued to increase by 7.4% from $9.5 million to $10.2 million; an amount equal to 78% of the District's undesignated fund balance as of the start of 2013-2014. MMWD's worker-to-retiree ratio finished the period at 0.84 to 1.00.

NMWD's funded ratio has improved by 0.6% over the last three reported years finishing at 71.7%; the lowest ratio among the five subject agencies.

NMWD's Pension Obligations
Table 3-28 (Marin LAFCO / CalPERS)

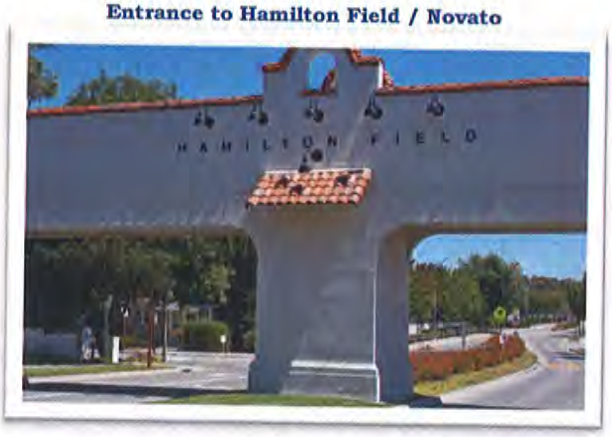
Category	2010-2011	2012-2013	Difference
Annual Contribution	$0.9 million	$1.0 million	17.0%
Funded Ratio – Market	**71.3%**	**71.7%**	**0.6%**
Unfunded Liability - Market	$9.5 million	$10.2 million	7.4%
Active to Retiree Ratio	1.0	0.84	(16.0%)

CHAPTER FOUR EXCERPT

B. NORTH MARIN WATER DISTRICT

1.0 Overview

Entrance to Hamilton Field / Novato



The North Marin Water District (NMWD) was formed in 1948 and encompasses an approximate 100 square mile jurisdictional boundary spanning three distinct service areas. The main service area includes the City of Novato and the adjacent unincorporated areas of Bel Marin Keys, Black Point, Loma Verde, Green Point, and Indian Valley. NMWD's other two service areas are located in West Marin with the largest covering the adjacent communities of Point Reyes Station, Inverness Park, Paradise Ranch Estates, Bear Valley, and Olema. The third service area covers Dillon Beach's Ocean Marin Subdivision. Governance is provided by a five-person board whose members are registered voters elected at-large to staggered four-year terms. NMWD overlaps multiple school districts with most students in the main service area within the Novato Unified School District.

North Marin Water District

Formation Date	1948
Enabling Legislation	Water Code Section 30000 et. seq.
Service Categories	Potable Water Non Potable Water Wastewater
Service Population	64,845
Registered Voters	35,278
Current Buildout Population Estimate	69,101

NMWD is organized as a limited-purpose agency and provides three services: (a) potable water; (b) non-potable water; and (c) wastewater with the latter limited to the Oceana Marin Subdivision in Dillon Beach. Close to three-fourths of potable water supplies are imported by NMWD from the Russian River through a contract with the Sonoma County Water Agency. The remaining one-fourth of potable water supplies are drawn locally from Stafford Lake and tied to diverting flows from Novato Creek. The average daily water demand per resident in MMWD's Novato and Point Reyes Station systems over the study period has been 130 and 118 gallons, respectively.[182]

NMWD's total service population is estimated by the Commission at 64,845 with 97% - or 62,891 – residing within the Novato system as of the term of this study period. It is also estimated NMWD's service population – and specifically those directly served by the District's potable water system – has increased by 0.4% over the study period and is slightly below the county wide growth rate average of 0.6% over the same period. The

[182] These amounts are drawn from total water production between 2009 and 2013 and calculated using the Commission's own resident population projections for NMWD.

projected buildout population as calculated by the Commission and based on current planning policies of the two land use authorities within NMWD is estimated at 69,101.[183] Registered voters total 35,249 and represents 54.4% of the estimated population. The operating budget as of the term of the study period was set at $18.6 million with funding anticipated to cover the labor costs for 50.0 equivalent fulltime employees. The unrestricted/undesignated fund balance was $13.071 million and sufficient to cover 36 weeks of general operating expenses as set for 2013-2014.

2.0 Background

2.1 Community Development

NMWD's main service area – Novato – began its present-day development in the 1850s in step with the inclusion of the region as part of a Mexican land grant – "Ranchos Novato" – that came under the ownership in 1856 of two eventual community patriarchs: Joseph Sweetser and Francis DeLong.[184] The two men subsequently planted thousands of acres of apple orchards throughout the rancho and later began selling excess lands to arriving Europeans, leading to the establishment of ranching and dairy operations in the area. By the 1880s, following the arrival of the railroad connecting the area to regional commerce, development interests intensified and the Home and Farm Company purchased and subdivided nearly 6,000 acres of present-day Novato. This purchase marked Novato's gradual and outward transition from agricultural to urban and immediately preceded the construction of a commercial corridor along present-day Grant Avenue as well as adjacent Victorian-style homes to be known as "Old Town" as the community entered the 20th Century.



183 Current and projected service populations are detailed in Section 4.1.
184 Background information is principally drawn from prior LAFCO reports and substantively supplemented from Then and Now's *Novato* (Novato Historical Guild with Ron Vela).

Novato's urban development continued incrementally through the early 1900s as ranchers began selling their lots to make way for new residential subdivisions, mostly located along stretches of Novato Creek west of Old Town. Novato's development was tempered for many decades due to sustained ranching and dairy operations that proved profitable and it was not until 1920 when the community's population reached an estimated 1,200 and helped promulgate the need and formation of the Novato Fire Protection District in 1926. Wartime planning in 1935 escalated Novato's growth with the conversion of the Marin County Airport to the Hamilton Air Force Base and resulted in new housing and commercial demands throughout the region. The transition and operation of Hamilton by the Air Force, notably, contributed to a sizable increase in Novato's population with the census count rising to 3,500 by 1950.

Organized water service within Novato was initially established through private utilities beginning in the early 1900s in step with individual subdivisions before eventually coming under common ownership by the Novato Water Company during the 1920s. Water was sourced from groundwater wells and was generally low quality but adequate for the relatively slow-growing community through the 1930s. The establishment of the Hamilton Air Force Base and the resulting commercial and residential development proved taxing on the now combined private water system and prompted community leaders in 1947 to ask Marin Municipal Water District (MMWD) to extend their services north and into Novato.[185] MMWD declined and the community leaders transitioned their efforts in devising plans on establishing a new public water agency to purchase Novato Water Company's system and assume service responsibilities thereafter.

2.2 Formation Proceedings

The formation of NMWD – which was initially termed the North Marin County Water District – was petitioned by area landowners and completed in 1948 with the County of Marin's Boundary Change Commission approving the official service area of the District followed by a successful vote of residents.[186] The original boundary included approximately 40,000 acres of unincorporated territory and was anchored by Novato's Old Town. An initial five-member Board of Directors was also elected and shortly thereafter separate measures were approved to fund NMWD's purchase of the Novato Water Company and its facilities along with making improvements. These subsequent voter-approvals also authorized NMWD to proceed with establishing a new stand-alone surface water supply by damming Novato Creek and creating Stafford Lake.

[185] MMWD initially provided water service to Hamilton Air Force Base before NMWD assumed responsibility in 2002.
[186] The County Boundary Commission was a technical governing body tasked with officially designating the jurisdictional boundary of all boundary changes prior to LAFCO's creation in 1963. The boundary commissions included four distinct members of county government, supervisor chairperson, assessor, auditor, and surveyor.

2.3 Post-Formation Activities and Events

A summary of notable activities undertaken by NMWD and/or affecting the District's service area following formation in 1948 is provided below.

1950s

- NMWD completed construction of the Stafford Dam in 1951 along with ancillary improvements tied to onsite treatment and distribution facilities in support of the District's Novato system. The resulting water body – Stafford Lake – draws water from Novato Creek and was initially outfitted with a holding capacity of 1,720 acre-feet. This capacity was raised to 4,450 acre-feet in 1954 and enhancing annual safe yield to 2,000 acre-feet.

1960s

- Voters approved the City of Novato's incorporation on November 3, 1959 with an effective date of January 20, 1960. The estimated population at the time of Novato's incorporation was 17,881.

- NMWD entered into an agreement in 1960 with Sonoma County Water Agency for an annual supply of 10,000 acre-feet of pretreated water drawn from the Russian River and wheeled through an interconnection with the City of Petaluma. The resulting intertie – to be known as the North Marin Aqueduct – was constructed one year later and involved an approximate 10-mile 30-inch pipeline connecting NMWD's water system to Sonoma County Water Agency's water system in Petaluma along State Highway 101.

- NMWD annexed several unincorporated communities between 1969 and 1979 in West Marin at the request of local citizens and leading to the establishment of a second service area, Point Reyes Station. These annexations involved the Point Reyes Station, Olema, Paradise Ranch Estates, Inverness Park, Oceana Marin, and Tomales communities and were expected to facilitate NMWD purchasing and assuming service responsibilities from preexisting private utilities. Voters ultimately approved assessment districts in Point Reyes Station and Inverness Park in 1970 with NMWD purchasing and assuming water services in these communities thereafter. Similar voter-approvals and service establishments in Olema occurred in 1973 and Paradise Ranch Estates in 1978.[187]

1970s

- NMWD assumed wastewater service in 1973 for the 251-lot Oceana Marin Subdivision adjacent to the unincorporated community of Dillon Beach at the request of the County of Marin.

[187] Inverness PUD established water service for North Inverness in 1951. Dillon Beach continues to be served by a private water company. No community water service exists in Tomales.

1970s

- NMWD entered into a new water supply agreement in 1974 revising and expanding its existing agreement with the Sonoma County Water Agency. The revised agreement established funding and capacity allowances tied to a new intertie pipeline and production facilities needed to improve Russian River deliveries to South Sonoma County and NMWD. The revised agreement increased NMWD's capacity allowance to 11.2 million gallons per day of treated water through the North Marin Aqueduct.[188]

- NMWD built and operated a community wastewater system for the unincorporated community of Tomales in 1979. The wastewater system was turned over to the newly created Tomales Village Community Services District in 1999 as part of a voter-approved reorganization in which the unincorporated community was detached from NMWD.

1990s

- The Hamilton Air Force Base – earlier termed the Hamilton Army Airfield – officially closed in 1996 following a decade long draw-down in military uses with Novato assuming land use control thereafter.

2000s

- The Hamilton area was annexed to NMWD in 2002 consistent with the terms of a memorandum of understanding between NMWD and MMWD premised on aligning the former's southern boundary to match the City of Novato.

- NMWD prepared and completed its first Urban Water Management Plan in 2005 covering the Novato service area. The document was updated in 2011 and projects an existing shortfall in available supplies under single-dry year conditions that will peak at (715) acre-feet in 2015 before gradually decreasing through anticipated conservation efforts and recycled water development to (172) acre-feet in 2035.

- Construction was completed in 2006 on upgrading NMWD's Stafford Lake Water Treatment Plant. The upgrade cost $16.0 million and increased daily treatment capacity for the facility to 6.0 million gallons.

[188] NMWD's revised daily capacity allowance of 11.2 million gallons is the equivalent to 34.4 acre-feet.

2.4 Previous Municipal Service Review

The Commission's inaugural municipal service review for NMWD was completed in June 2002 as part of a regional study of the Novato area.[189] This initial municipal service review provided a baseline review of NMWD's water system specific to the Novato service area; no review of the Point Reyes Station system was performed. The document concluded NMWD appeared to be operating efficiently and in a fiscally sound manner with no significant infrastructure needs or deficiencies identified. The document also concluded no alternative reorganizations appeared merited for additional study relative to improving accountability or efficiency.

3.0 Commission Boundaries / Service Areas

3.1 Jurisdictional Boundary

NMWD's existing jurisdictional boundary is approximately 100 square miles in size and covers over 64,600 acres with over four-fifths (53,505 acres) lying in unincorporated areas. Overall there are 23,236 legal parcels within NMWD based on County Assessor's Office with a current combined assessed value of $11.103 billion. Ownership of these legal parcels is divided between 96% private and 4% public with the latter category disportionately accounting for almost one-third (29.1%) of all jurisdictional acres (including water and right-of-ways). Total assessed value (land and structures) within NMWD is set at $11.1 billion as of January 2015.

NMWD's jurisdictional boundary spans 100 square miles with 83% of total District acres lying within the unincorporated area; the remaining 17% lies in the City of Novato. Current assessed value is set at $11.1 billion and represents an estimated per capita value of $0.171 million.

The portion of NMWD's jurisdictional boundary under private ownership is largely developed – though not necessarily to maximum density – with 95.0% or 21,221 of the affected legal parcels with improved structures. This existing development, notably, includes 24,228 total residential units.[190] Projected future development of the remaining privately owned and undeveloped lots within NMWD is estimated by the Commission to include the future construction of 1,361 new residential units and nearly all tied to single-family structures. This projection is further

Projected future development within NMWD is estimated by LAFCO to include the future construction of 1,361 new residential units and nearly all tied to single-family structures.

[189] Other agencies included in the referenced inaugural municipal service review included the City of Novato, Bel Marin Keys Community Services District, Novato Sanitary District, and the Novato Fire Protection District.

[190] Existing residential units within NMWD are divided between the City of Novato at 19,391 and the County at 4,837 based on County Assessor Office's records accessed through MarinMap. (NMWD reports a similar residential unit total of 23,943.)

divided between the future construction of 889 units in the Novato system and 426 units in the Point Reyes Station system as detailed in the accompanying footnote.[191]

NMWD's Jurisdictional Boundary Characteristics
Table 4-112 (Marin LAFCO / Marin LAFCO)

Total Jurisdictional Acreage	64,620
Total Jurisdictional Parcels	23,236
- Number of Parcels Under Private Ownership / Total Acres	22,333/ 35,980
- Number of Parcels Under Public Ownership / Total Acres	903 / 14,750
- Total Number of Water or Public Right-of-Way Acreage	13,890
- Percentage of Parcels Under Private Ownership Developed	96.0
- Percentage of Parcels Under Private Ownership Undeveloped	4.0
Total Number of Registered Voters	35,249
Total Assessed Value	$11.103 b

Notes to Boundary Characteristics Table:

1) There are 903 parcels within NMWD that are owned by a public agency and therefore are not assigned an assessed value for purposes of property tax collection.

3.2 Boundary Trends

NMWD's jurisdictional boundary has expanded by close to one-third since the Commission assumed responsibility in overseeing the District's physical development and service area in 1963. Overall there have been 18 recorded boundary changes to NMWD during this period, with the majority of the additions tied to annexations in West Marin occurring between 1966 and 1975. These annexations were generally engendered at the request of the County of Marin to facilitate NMWD purchasing several private water service utilities within these West Marin communities that were collectively experiencing service problems and required public-financing to make necessary improvements to accommodate needs going forward. [192] One exception involved the phased annexation of the Oceana Marin Subdivision adjacent to Dillon Beach in the early 1970s and its singular purpose of NMWD establishing public sewer service for the residential development. The most recent boundary change of significance occurred in 2002 with the annexation of the former Hamilton Air Force Base to NMWD. The last five boundary changes involving NMWD have primarily involved annexations in Oceana Marin to connect existing residential lots to the sewer system and are listed below.

NMWD's Last Five Boundary Changes
Table 4-113 (Marin LAFCO)

Affected Area	Action	Date Completed	Service Area	Acreage
Lands of Smith / Dillon Beach	Annexation	August 6, 1993	West Marin	0.40
Tomales Community/ Tomales	Detachment	November 23, 1999	West Marin	173.90
Hamilton Field / South Novato	Annexation	June 24, 2002	Novato	980.17
Lands of Mott / Dillon Beach	Annexation	November 28, 2006	West Marin	0.59
Lands of Brown / Dillon Beach	Annexation	May 29, 2013	West Marin	0.13

191 The projected new residential development is based on land availability assessed in the affected two local land use authorities' housing elements specific to NMWD's jurisdiction prepared for 2015-2023 cycle.

192 One of the West Marin areas annexed – Tomales – in the late 1960s was subsequently detached from NMWD in 1998 as part of the formation of the Tomales Community Services District at the request of residents.

3.3 Sphere of Influence

NMWD's sphere of influence is presently 63,990 acres or 100 square miles in size and entirely coterminous with the jurisdictional boundary. The sphere was established by the Commission in December 1984 and purposely set to match NMWD's entire jurisdictional boundary with the notable exception of excluding the unincorporated community of Marshall. (The establishment of NMWD's sphere coincided with similar actions for nearly one dozen other agencies.) The Commission subsequently approved applicant petitions to expand the sphere between 1990 and 1993 to include the Oceana Marin Subdivision next to Dillon Beach (West Marin) and Hamilton Field (Novato). The Commission also completed a sphere update in 2002 as a result of CKH that affirmed the designation with the addition of Marshall.

NMWD's sphere is entirely coterminous with its jurisdictional boundary; i.e., this baseline suggests no expansion of the jurisdictional boundary is expected as of the last update in 2002.

3.4 Outside Services

NMWD reports the District currently provides water service to 38 properties lying outside its jurisdictional boundary. All of these outside service connections lie beyond NMWD's sphere of influence with the majority – 33 – located in Sonoma County and mostly support non-residential uses immediately south of the City of Petaluma. These outside services were first established in the 1960s with a current registry below.[193]

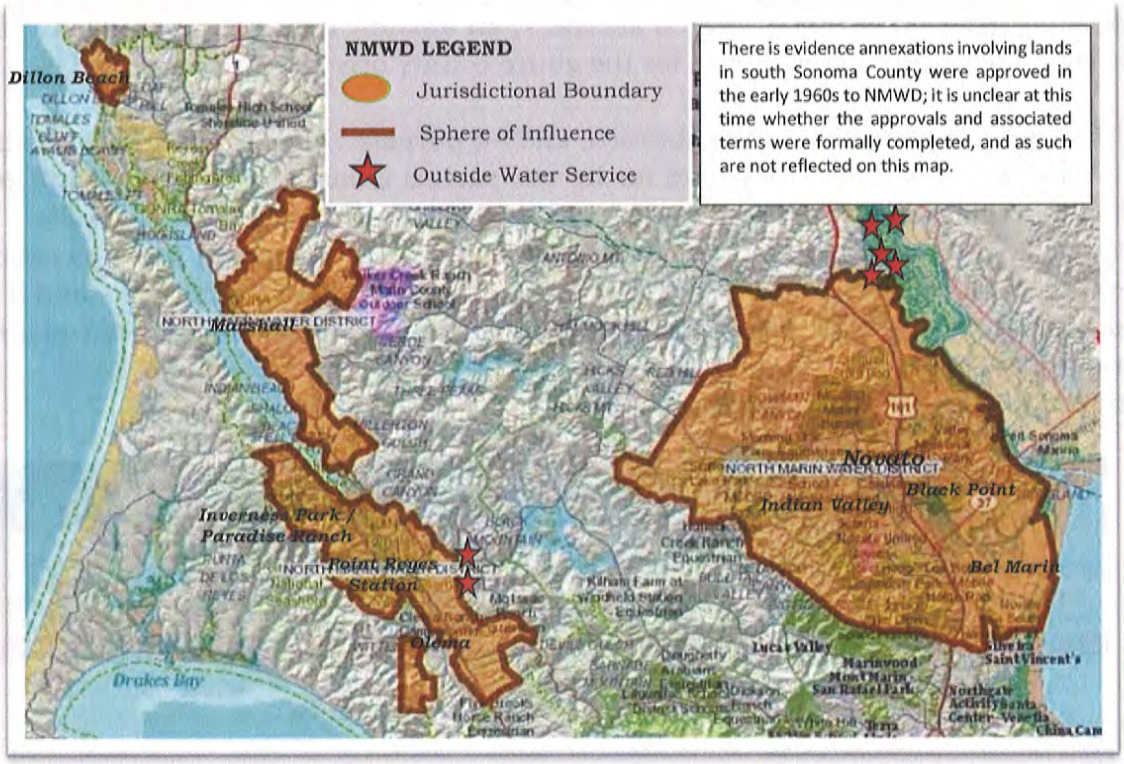
NMWD's Active Outside Water Service Connections
Table 4-114 (NMWD)

Street Address	Assessor Number	Water System
12602 State Route 1	119-020-07	Point Reyes Station
12700 State Route 1	119-020-10	Point Reyes Station
12710 State Route 1	119-020-11	Point Reyes Station
14700 State Route 1	119-020-22	Point Reyes Station
12800 State Route 1	119-020-10	Point Reyes Station
200 Tomasini Canyon	119-050-11	Point Reyes Station
4115 Kastania Road	019-320-013	Novato
4220 Redwood Highway South	019-330-021	Novato
4410 Redwood Highway South	019-330-004	Novato
4415 Redwood Highway South	019-330-005	Novato
4414 Redwood Highway South	019-310-022	Novato
4418 Redwood Highway South	019-310-019	Novato
4412 Redwood Highway South	019-310-029	Novato
4796 Redwood Highway South	019-310-012	Novato
2543 Petaluma Blvd South	019-220-038	Novato
21 Gunn Drive	019-300-005	Novato
4550 Redwood Highway South	019-330-006	Novato
4300 Redwood Highway South	019-330-017	Novato
3351 Redwood Highway South	019-320-010	Novato

[193] As of 2001, all outside service extensions are required to request and receive Commission approval under G.C. Section 56133 with the Legislature prescribing two types of approval allowances. First, if located within the affected agency's sphere of influence, LAFCO may approve a request for outside service in explicit expectation of a later change of organization. Second, if located outside the sphere of influence, LAFCO may approve a request for outside service in explicit response to a documented public health or safety finding.

Street Address	Assessor Number	Water System
2244 Petaluma Blvd	019-320-023	Novato
3357 Petaluma Blvd	019-320-021	Novato
4680 Redwood Highway South	019-310-013	Novato
2645 Petaluma Blvd South	019-220-006	Novato
210 Landing Way	019-220-016	Novato
150 B Landing Way	019-220-015	Novato
2551 Petaluma Blvd South	019-220-009	Novato
2581 Petaluma Blvd South	019-220-036	Novato
2531 Petaluma Blvd South	019-220-010	Novato
2141 Petaluma Blvd South	019-220-011	Novato
4600 Redwood Highway South	019-310-028	Novato
4420 Redwood Highway South	019-310-023	Novato
5200 Redwood Highway South	019-300-016	Novato
4900 Redwood Highway South	019-300-017	Novato
4775 Redwood Highway South	019-330-013	Novato
3905 Redwood Highway South	019-320-027	Novato
4809 Redwood Highway South	019-330-028	Novato
9 Cloud	019-300-015	Novato
2543 Petaluma Blvd	019-220-038	Novato

3.5 Agency Map



4.0 Demographics

4.1 Population Estimates

NMWD's resident service population served by the District's two water systems is estimated by the Commission at 64,845 as of the term of this study period. This estimate is divided between 62,891 and 1,954 within the Novato and Point Reyes Station systems, respectively.[194] This estimate also indicates NMWD is at 93.8% with respect to its meeting its jurisdictional boundary's projected buildout total of 69,101 based on the current policies and housing projections of the two affected land use authorities.[195] The current resident estimate is based on a modified calculation specific to public water systems and represents a total population growth rate of 0.42% over the preceding five year period or 0.08% annually; an amount that is 1.5 times lower than the estimated annual growth rate for the entire county over the same period.

LAFCO estimates there are 64,845 total residents within NMWD that are explicitly served by the District. This means NMWD is at 94% of its resident buildout, and not expected to reach buildout until 2083.

With respect to projections going forward, and for purposes of this review, it is assumed the growth rate within NMWD and for its two service areas – Novato and Point Reyes Station – will match the study period with an overall yearly change of 0.08%. The substantive result of this assumption would be an overall increase in NMWD's resident population of 587 and produce a total of 65,432 by 2023. It also indicates – and if this growth rate were to hold thereafter – NMWD will reach its estimated current-planning resident buildout of 69,101 in the year 2083. These collective projections – past, current, and future – are summarized below.

NMWD: Population Estimates For Water Systems
Table 4-115 (Marin LAFCO)

Service Area	2009	2013 -Baseline-	2018	2023	Annual Trend
Novato	62,657	62,891	63,143	63,396	0.08%
Point Reyes Station	1,915	1,954	1,994	2,036	0.41%
	64,572	64,845	65,137	65,432	0.08%

[194] California Code of Regulations Section 64412 identifies three methods to calculate the number of persons served by a public water system: 1) census data; 2) service connections multiplied by 3.3, or 3) living units multiplied by 2.8. Staff has determined a hybrid option is appropriate with respect to estimating NMWD's resident service population that combines two distinct calculations: (a) multiply the number of residential connections in the Novato system by 3.3 and (b) multiply the number of residential connections in the Point Reyes Station system by 2.8.

[195] NMWD's resident buildout population has been calculated by the Commission and based on multiplying the total number of potential new units identified in the two affected land use authorities' housing elements – 1,361 – that lie within the District by either a factor of 3.3 (Novato system) or 2.8 (Point Reyes Station system). Actual construction is subject to external factors and highlighted by the status of the moratorium on water service connections and market demands and permit approvals from the affected land use authorities.

4.2 Residency Type



The Commission projects for the purposes of this review that NMWD's estimated residential total of 64,845 as of the term of the study period is roughly divided between 55,572 fulltime or owner-occupied versus 9,273 part-time or non-owner occupied residents with the accompanying calculation footnoted.[187] This projection is based on a review of current County Assessor records and indicates no less than 86% of NMWD's residents are presumably

4.3 Social and Economic Indicators

NMWD's fulltime constituents are generally aligned statistically with countywide averages with respect to social and economic indicators with the notable exceptions of lower median household incomes and higher unemployment levels.

A review of demographic information covering the study period for the communities within NMWD's jurisdictional boundary – specifically a weighted calculation involving Novato, Point Reyes, Black Point, and Dillon Beach (Oceana Marin) – indicates the District's service population generally follows countywide norms with three notable exceptions. First, NMWD's overall service population is statistically less affluent given lower median household incomes and higher unemployment levels compared to countywide averages with the latter being a difference of nearly one-fourth and having increased by 27.7% over the five-year sampling period. Second, educational attainment among residents within NMWD is lower than countywide averages as measured by adults with bachelor degrees by more than one-fifth. Third, the jurisdictional boundary's residents are statistically more heterogeneous relative to the countywide average. The former two referenced distinctions are driven and pronounced in NMWD's main service area of Novato where median household incomes and bachelor degree holdings as of the last census release was $79,664 and 44.9%, respectively, and in comparison to countywide averages of $90,962 and 54.6%. A summary of trends in pertinent demographic information for NMWD's service communities follows.

[196] This projection is based on taking the total number of units - 19,512 - assigned to all developed single-family residential lots within NMWD and developing a percentage of those associated units with local ownership addresses (85.7%) versus those with non-local mailing addresses (14.3%) and applied to the projected overall population of 64,845. The projection does not take into account the potential for non-owner residents (renters) within NMWD.

NMWD Resident Trends in Social and Economic Indicators
Table 4-116 (Marin LAFCO / American Communities Survey)

Category	2005-09 Averages	2008-12 Averages	Trend	Marin County 2008-12 Average
Median Household Income	$81,555	$80,523	(1.3%)	$90,962
Median Age	42.7	44.0	3.0%	44.6
Prime Working Age (25-64)	55.8 %	56.1%	0.5%	56.6%
Unemployment Rate (Labor Force)	4.7%	6.0%	27.7%	4.5%
Persons Living Below Poverty Rate	6.8%	7.2%	5.9%	7.5%
Mean Travel to Work	30.9 minutes	28.8 minutes	(6.8%)	28.4 minutes
Adults with Bachelor Degrees or Higher	42.3%	45.0%	6.4%	54.6%
Male	49.9%	47.8%	(4.2%)	49.2%
Female	50.1%	52.2%	4.2%	50.8%
White / Non-Hispanic	70.1%	71.2%	1.7%	73.1%
Hispanic	17.5%	16.6%	(5.4%)	15.3%
Other	12.4%	12.1%	(2.4%)	11.6%

Notes to Demographics Table:

1) This table reflects a weighted calculation prepared by LAFCO staff coalescing census data generated for the communities of Novato (95.9%), Black Point (2.2%), Point Reyes Station (1.1%), and Dillon Beach (Oceana Marin) (0.8%).

5.0 Organizational Structure

5.1 Governance

NMWD's governance authority is codified under the County Water District Act ("principal act") and empowers the District to provide a limited purpose of municipal services upon approval by LAFCO. NMWD – which is currently one of 162 county water districts operating currently in California – is presently authorized to provide three specific services within its jurisdictional boundary: (a) domestic water; (b) non-potable water; and (c) wastewater. All other latent powers enumerated under the principal act would need to be activated by the Commission before NMWD would be allowed to initiate; similarly divesture of existing powers would also require prior approval from LAFCO.

LAFCO approval is needed for NMWD to activate a latent power or divest itself from an existing service.

A list comparing active and latent power authorities under the principal act follows.

Active Service Powers

- potable / non potable water
- wastewater

Latent Service Powers

- reclamation
- recreation
- hydroelectric power
- fire protection
- solid waste/garbage

NMWD has been governed since its formation in 1948 as an independent special district with registered voters comprising a five-member governing board. Members are either elected or appointed in lieu of a contested election to staggered four-year terms with a rotating president system and receive a $205 meeting per diem. NMWD currently meets on the first and third Tuesday at 7:00 P.M. of each month at the District's Administrative Office at 999 Rush Creek Place in Novato. A listing of Board members with respective backgrounds and continuous years served follows.

NMWD Board Roster
Table 4-117 (NMWD)

Member	Position	Background	Years on Board
Jack Baker	President	Civil Engineer	31
John C. Schoonover	Vice President	Self-Employed	30
Rick Fraites	Member	Administrative Aide	10
Stephen Petterle	Member	Landscape Architect	10
Dennis J. Rodoni	Member	Contractor	19
		Average Years of Board Experience	20

5.2 Administration

NMWD appoints an at-will General Manager to oversee all District activities. The current General Manager – Chris DeGabriele – was appointed by the Board in 1995 and manages a present budgeted staff of 50 fulltime equivalent employees; the latter of which is divided between four distinct personnel divisions: (a) administrative/finance; (b) engineering; (c) construction; and (d) operations. Legal services are provided by contract with Robert Maddow and his firm Bold, Polisner, Maddow, Nelson and Judson LLC. NMWD's administrative offices are located at 999 Rush Creek Lane in Novato.

NMWD Administrative Offices



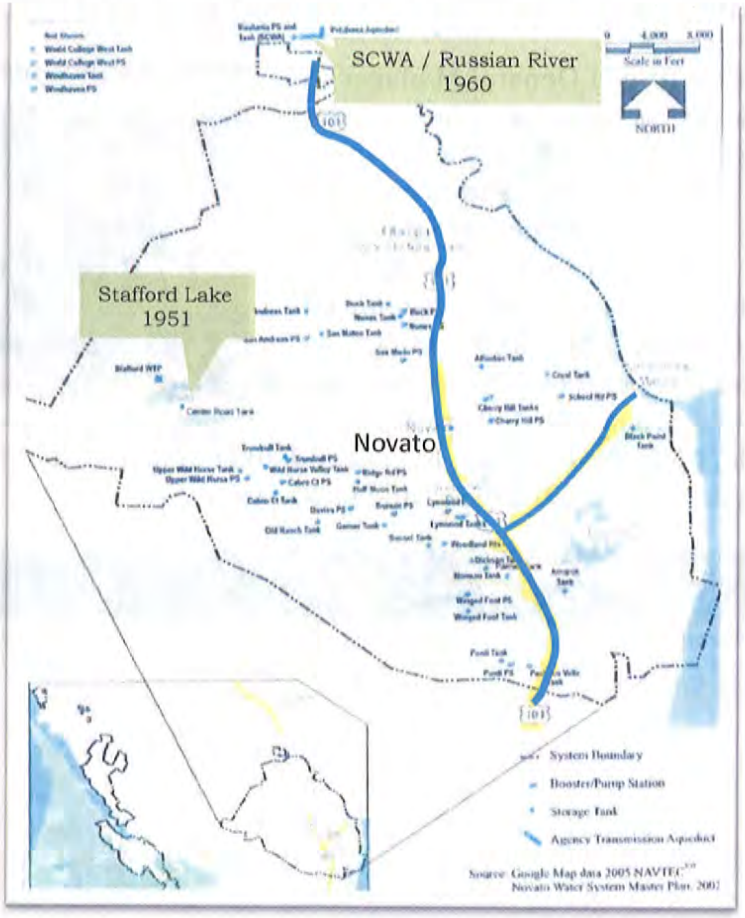
NMWD Administration
Table 4-118 (NMWD)

General Manager	Chris DeGabriele
Legal Counsel	Robert Maddow
Water System Operator	Robert Clark

6.0 Potable Water Services

6.1 Service Overview

NMWD directly provides retail potable water services through a combination of its own and contracted supply, treatment, storage, and distribution facilities. The NMWD facilities were initially inherited from prior private utility companies beginning with the purchase of the Novato Water Company in 1948. Other private utility systems in West Marin (Point Reyes Station) were purchased and later consolidated by NMWD between the 1960s and 1970s. The end result is NMWD operating two stand-alone water systems termed (a) "Novato" and (b) "Point Reyes Station" with distribution networks that separately span 317 and 24 miles, respectively. NMWD also provides non-potable water services to limited areas within its jurisdictional boundary. A summary review of these non-potable water services are addressed in a succeeding section and a graphical overview of NMWD's Novato water system follows.[197]



[197] Inclusion of a graphical overview for NMWD's Point Reyes Station system will be added as a subsequent appendix.

6.2 Supplies

Novato System

NMWD's potable water supplies for the Novato system are drawn from a combination of local and imported sources. These sources – all of which have permit or contractual terms – collectively provide the Novato system with access to a maximum annual supply of 22,554 acre-feet. A summary of these water sources divided between primary (Russian River) and secondary (Novato Creek) follows.

NMWD's maximum annual potable water yield for the Novato system is calculated at 22,554 acre-feet and tied to its two established sources: Russian River and Novato Creek.

Primary Source

NMWD's primary potable water source for the Novato system is drawn from the Russian River Project and secured through a wholesale agreement with the Sonoma County Water Agency (SCWA).[198] This agreement provides NMWD with an annual contractual entitlement of up to 4.5 billion gallons or 14,100 acre-feet of treated potable water drawn from underflow of the Russian River through specialized filtering wells near Forestville in Sonoma County. This agreement was originally established in 1960 and restructured most recently in 2006 with a current term date of June 2040.[199] The agreement enables NMWD through a cost-sharing arrangement with SCWA and other regional contractors to divert, treat, and convey – or wheel – water from the Russian River through a series of aqueducts, pipelines and pumps that ultimately spans nearly 30 miles before connecting to the District's distribution system. The agreement allows for fluctuation to address high usage periods and authorizes NMWD to take up to 20.9 million gallons or 64.1 acre-feet in a single day. Deliveries from the Russian River totaled 2.8 billion gallons or 8,455.6 acre-feet at the term of the study period accounted for slightly more than three-fourths of all NMWD supply production during the year.

The Novato system's primary potable supply is the Russian River and secured through a contract with SCWA; a dependent special district of the County of Sonoma. The contract provides NMWD an entitlement of up to 14,100 acre-feet of treated water each year less any external restrictions.

[198] The Russian River Project was constructed by the United States Army Corps of Engineers beginning in the 1950s to improve flood control and access and reliability to water supplies drawn from the Russian River and its approximate 1,500 square mile watershed. Two public work projects anchor the Russian River Project and are tied to impounding and storing flows for later release as needed. Lake Mendocino was created in 1958 with the construction of the Coyote Valley Dam near the City of Ukiah and has a supply capacity of 122,500 acre-feet. Lake Sonoma was created in 1983 with the construction of the Warm Springs Dam near the City of Healdsburg and has a supply capacity of 245,000 acre-feet.

[199] The agreement includes a renewal option for NMWD to extend the agreement for additional 40 year terms.

A pump station currently affixed to the North Marin Aqueduct – the conveyance system delivering treated Russian River supplies to NMWD's distribution system – has a maximum capacity of 14,000 gallons per minute or 61.86 acre-feet per day. This capacity accommodates 97% of the maximum daily allowance total of 64.1 acre-feet.[200]

Secondary Source(s)

NMWD's secondary potable supply for the Novato system is drawn from the Novato Creek. This secondary supply is secured through appropriative rights and impounded at Stafford Lake with a reservoir holding capacity of 4,450 acre-feet.

Local surface supplies drawn from Novato Creek and generated from storage at Stafford Lake accounts for NMWD's remaining potable water supply for the Novato system.[201] NMWD maintains two separate post-1914 appropriative rights with the State Water Resources Control Board dating back as far as 1950 to draw water from Novato Creek through impoundment at Stafford Lake diversion points, and each with different usage allowances. These allowances, which also provide maximum daily and monthly amounts, authorize NMWD to collectively divert and use up to 8,454 acre-feet each year directly from the Novato Creek by gravity to its water treatment facility for immediate use within the distribution system.[202] The total holding capacity at Stafford Lake is 4,450 acre-feet. Water production from Stafford Lake totaled 803.5 million gallons or 2,465.5 acre-feet and accounted for slightly less than one-fourth of all NMWD supply production at the term of the study period for the Novato system.

Gravity provides diversion and conveyance of raw-water from Novato Creek through Stafford Lake to NMWD's adjacent treatment facility.[203]

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200 NMWD anticipates eliminating this conveyance restriction upon completion of a planned project to reposition a portion of the aqueduct to eliminate the need for the pump station with a completion date for late 2015.

201 The Novato Creek is a tributary to the San Pablo Bay.

202 License No. 9831 is predicated on a 2.9 cubic foot per second allowance to NMWD between September 1st and June 30th and translates to a daily and monthly maximum draw of 5.75 and 174.9 acre-feet, respectively. This license also allows NMWD to divert up to 4,490 acre-feet a year with 2,300 acre-feet authorized for use; the remainder goes to storage in Stafford Lake. Permit No. 18800 is predicated on a 9.75 cubic foot per second allowance between October 1st and April 1st and translates to a daily and monthly maximum draw of 19.33 and 588.08 acre-feet, respectively. This permit also allows NMWD to divert up to 8,454 acre-feet a year with 4,054 acre-feet authorized for use; the remainder goes to storage in Stafford Lake.

203 Pumps are available to NMWD to convey raw water from Stafford Lake when needed to boost flows as necessary.

Supply Average

NMWD's average water production drawn over the study period from the District's primary (Russian River) and secondary (Novato Creek) for the Novato system has been 3.232 billion gallons or 9,917.7 acre-feet.[204] The single-highest year-end use of these surface sources over the study period occurred in 2009 when NMWD collectively drew 3.559 billion gallons or 10,921 acre-feet; an amount that exceeded the average annual take by more than one-tenth and with 77.4% drawn from the Russian River.

NMWD's average annual water production over the study period from its two sources for the Novato system has been 9,917.7 acre-feet; an amount that is 47.7% of the maximum yield available.

Supply Reliability

The majority of NMWD's water supplies – on recent average 80% – is imported from Sonoma County and tied to a contractual relationship with externally prescribed terms and conditions. This contractual relationship means NMWD is largely dependent on a separate governing body – SCWA – in managing resources now and into the future to help ensure annual water entitlements to the Russian River Project are available to meet demands within the Novato system. This contractual relationship also requires dependency on other third-party agencies that contract with SCWA to abide by capacity allowances with the underlying conveyance system – such as the City of Petaluma – to avoid adversely impacting NMWD and its ability to access entitlements in a consistent and timely manner. The contract itself provides NMWD the sole discretion to renew or cancel in 40 year intervals.[205]

NMWD is significantly dependent on an external body – SCWA – in meeting its current and future system demands in the Novato system. This dependency produces a substantive impact on the reliability of NMWD's primary water supply given the associated externalities tied to the production, treatment, and delivery to the District.

The remainder of NMWD's water supplies – on average 20% - is locally sourced from Stafford Lake and provides a relatively reliable secondary supply directly managed by the District Board. NMWD also benefits from nearly one-half of the approximate 17.1 square mile watershed for Novato Creek protected from intensive urban development by either being under Williamson Act contracts and/or conservation easements with the Marin Agricultural Land Trust.[206] Nonetheless, the intensity of the agricultural uses – and in particular dairy operations – does impact water quality and merits further assessment going forward. Other impacts on this secondary water supply is periodic

[204] Totals are drawn from NMWD's annual diversion filings with the State Water Resources Control Board (2009 to 2013) and SCWA delivery reports (2008/2009 to 2013/2014).
[205] NMWD's existing agreement with SCWA is set to expire in June 2040. The contract provides NMWD the option to exercise an automatic 40 year renewal at its discretion.
[206] Estimates are based on data generated from MarinMap.

drought and climate change effecting – among other items - runoff needed to supply Novato Creek.

> NMWD projects an overall decrease in annual potable water supplies for the Novato system to 10,494 acre-feet during a significant drought year event based on applying conditions from 1976-1977. This projection represents a 46.5% decrease in supplies relative to the maximum potential yield available to NMWD's Novato system.

In 2011, as required under State law, NMWD published an update to its Urban Water Management Plan (UWMP) to guide long-term agency planning in matching demands with supplies.[207] The UWMP is specific to the Novato system and estimates NMWD's service population as of 2010 at 60,423 based on demographic information published by the Association of Bay Area Governments (ABAG) with a corresponding annual water demand of 8,832 acre-feet. The UWMP projects rises in both customers and demands with overall increases in these categories totaling 10.5% and 38.8%, respectively, by 2020. The UWMP also projects water supplies under normal, single dry-year, and multiple-dry year conditions relative to estimated demands through 2035. This includes a shortfall in supplies under single-dry year conditions for the Novato system and will peak at (715) acre-feet in 2015 before gradually decreasing to (172) acre-feet in 2035 due to increased conservation and recycled water production. The UWMP orients NMWD to anticipate an overall reduction of nearly one-half of the District's potable water supplies during single-dry or significant drought year conditions with totals decreasing from 22,454 acre-feet to 10,494 acre-feet; a difference of (12,060) acre-feet or (46.7%). This includes NMWD calculating specific reductions, relative to maximum conditions, of 43.3% in its primary water source (Russian River) and 70.4% in its secondary source (Novato Creek). These planning reductions appear sufficiently justified and correspond with the curtailment estimates made separately by LAFCO for West Marin agencies also using the 1976-77 water year as a baseline index with curtailments ranging from 76% to 38%.

The following table summarizes NMWD's water supply sources relative to right/permit allowance, normal year conditions, and drought year conditions.

[207] The Urban Water Management Planning Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections and/or supplying more than 3,000 acre-feet of water annually to adopt and submit a plan every five years to the California Department of Water Resources.

NMWD's Potable Water Supply Availability – Novato
Listed in Acre-Feet
Table 4-119 (Marin LAFCO / NMWD)

Water Source	Day Max From Source	Year Max From Source	Convey Day Max To NMWD	Convey Year Max To NMWD	76-77 Drought Day Max To NMWD	76-77 Drought Year Max To NMWD
	What is Available - legal right -		What is Accessible - normal/max conditions -		What is Accessible - drought conditions -	
SCWA / Russian River	64.13	14,100.00	61.86	14,100.00	36.55	7,991.00
Novato Creek - Stafford Lake	19.33	4,450.00	19.33	4,450.00	5.72	1,317.20
Novato Creek - Direct Flows	5.75	4,004.00	5.75	4,004.00	1.70	1,185.18
Total Yield	**89.21**	**22,554.00**	**86.94**	**22,554.00**	**43.97**	**10,493.38**

Total Calculated by NMWD to Parallel 1977; Individual Subtotals Estimated by LAFCO

Notes to Water Supply Table – Novato System:

1) NMWD's supplies to the Russian River are contractually defined as an entitlement and are subject to specified restrictions, including proportional reductions in deliveries due to low storage supplies.

2) NMWD's authority to divert flows from Novato Creek is secured through post-1914 appropriative rights.

3) A pump station affixed to the North Marin Aqueduct – the conveyance system that delivers treated Russian River supplies to NMWD's distribution system – has a maximum capacity of 14,000 gallons per minute or 61.86 acre-feet per day. This capacity is reflected in the daily conveyance maximum to NMWD. (A planned NMWD improvement set for completion in late 2015 is expected to realign the aqueduct and eliminate the need for the pump, which will allow NMWD to take its full contractual daily allocation of up to 64.1 acre-feet.)

4) Water diverted from Novato Creek is impounded at Stafford Lake and under normal circumstances conveyed by gravity to NMWD's adjacent treatment facility.

5) Drought year conditions reflect a 43.3% reduction compared to normal/max year conditions for entitlements to the Russian River and based on rainfall during the 1977 water year. A similar reduction in the amount of 70.4% is applied to supplies drawn from the Novato Creek.

Point Reyes Station System

NMWD's potable water supplies for the Point Reyes Station system are primarily sourced from local diversions tied to underflow from the Lagunitas Creek; a tributary to Tomales Bay within an approximate 38.1 square mile watershed.[208] This source coupled with pumping capacities collectively provide the Point Reyes Station system with access to an estimated available annual supply of 868.8 acre-feet, but reduced to a *maximum* annual availability of 654.0 acre feet based on current permit allowances. A summary of the Point Reyes Station system's primary ("Coast Guard Wells") and supplemental/emergency (Kent Lake) water source supplies follows.

NMWD's maximum annual potable water available for the West Marin water system is 654.0 acre-feet based on applicable permit capacities tied to its post-1914 appropriated rights to Lagunitas Creek.

[208] The watershed estimate for Lagunitas Creek generated using data from MarinMap.

Primary Source

> The Point Reyes Station system's primarily potable supply is underflow from Lagunitas Creek and accessed through two wells located on Coast Guard property. The "Coast Guard Wells" and the associated permits provide NMWD a daily and annual take of 3.85 and 654.0 acre-feet of water, respectively.

NMWD's primary potable water source for the Point Reyes Station system is tied to two groundwater wells that access underflow from Lagunitas Creek and located on land owned by the United States Coast Guard. These wells – collectively termed "Coast Guard Wells" – lie adjacent to each other and drilled to depths of approximately 60 feet and powered by submersible pumps each outfitted with 30 horsepower engines. The rated capacity of the Coast Guard wells when operating concurrently is 420 gallons per minute and could produce a daily maximum of 0.603 million gallons or 1.86 acre-feet, and if run continuously produce a yearly total of 220.1 million gallons or 675.3 acre-feet. These theoretical annual amounts are higher than the permitted allowance for NMWD to divert and use underflow from Lagunitas Creek set by the State Water Resources Control Board. These permits – which constitute post-1914 appropriated rights – collectively assign NMWD to daily and annual maximum totals of 3.85 and 654.0 acre-feet, respectively.[209] The Coast Guard Wells are located next to the treatment facilities.

As a supplemental access point to permitted Lagunitas underflow, NMWD also has developed a second well site along the Lagunitas Creek located upstream from the Coast Guard Wells. The "Gallagher Well" was drilled in 1993 at a depth of 55 feet and is to be used when above-normal high tides cause excessive salinity intrusion in the Coast Guard Wells. The Gallagher Well lies approximately one mile upstream from the Point Reyes Treatment Plant with the underlying connecting pipeline completed in mid 2015. The Gallagher Well draws on underflow of Lagunitas Creek and the diversions are covered under the permitted water rights tied to the Coast Guard Wells. The current rated pump capacity is 0.173 million gallons or 0.53 acre-feet daily, and if run continuously – and irrespective of water right limitations – totals 63.1 million gallons or 193.5 acre-feet per year.[210]

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209 NMWD holds three active water rights for underflow from Lagunitas Creek. License No. 4324B allows NMWD to divert 0.67 cubic feet per second (producing a daily max of 1.11 acre-feet) with a maximum annual use of 148.8 acre-feet each year at its well sites between May 1st and November 1st. Permits No. 19724 and No. 19725 are year-round allowances, although are classified as junior rights and therefore not available between July and October during dry-years. Permit No. 19724 allows NMWD to divert up to 0.699 cubic feet per second (producing a daily max of 1.15 acre-feet) with a maximum annual use of 212.7 acre-feet. Permit No. 19725 allows NMWD to divert up to 0.961 cubic feet per second (producing a daily max of 1.59 acre-feet) with a maximum annual use of 292.5 acre-feet. Together Permits No. 19724 and 19725 allows NMWD to collectively divert an additional divert up to 505.2 acre-feet each year from January 1st to December 31st at its well sites. These latter two permits, however, are conditioned to prohibit diversions between July and October in "dry-years".

210 Daily and annual capacities of the Gallagher Well based on a 120 gallon per minute rating.

Secondary Source

NMWD has an agreement with the Marin Municpal Water District (MMWD) to receive up to 250 acre-feet of raw water stored at Kent Lake through Lagunitas Creek. This secondary source is limited to prescribed dry-year conditions and specfically between July and September when NMWD's permited daily water allowance is reduced from 1.25 million gallons or 3.85 acre-feet to 0.433 million gallons or 1.33 acre-feet. This agreement is intended to allow NMWD to remain generally whole in accessing underflow from Lagunitas Creek when permit conditions curtial normal use, and as such, is not considered a new and separate source for purposes of this review.

Supply Average

NMWD's average water production drawn over the study period from Lagunitas Creek for the Point Reyes Station system has been 95.5 million gallons or 293.2 acre-feet.[211] The single-highest year-end use during this period occurred in 2009 when NMWD collectively drew 141.0 million gallons or 432.7 acre-feet; an amount that exceeded the average annual amount during the study period by more than two-thirds.

LAFCO projects NMWD's annual potable water supplies declining by 14% to 560.5 acre-feet during significant droughts based on 1976-1977; a decline amount that is lessen by the addition of dry-year flows from MMWD.

Supply Reliability

With respect to reliability, and like other public water service providers in the region, the reliability of NMWD's water supply for the Point Reyes Station system is relatively safe from external restrictions given it is entirely locally sourced. NMWD also benefits from its underflow source lying within a relatively secure watershed in terms of limited current and planned urban development. The lone – albeit significant – constraint on NMWD's water supply for the Point Reyes Station system is climate change effecting runoff needed to charge Lagunitas Creek and the salt-water intrusion.

NMWD's average annual potable water production over the study period for the Point Reyes Station system has been 293.2 acre-feet; an amount that is 44.8% of the maximum available diversion rate.

No formal analysis has been performed by NMWD to quantify the District's water supply reliability for the Point Reyes Station system during different hydrological periods. Accordingly, and for purposes of this planning document, it appears reasonable to assume some level of curtailment will occur during extended dry periods reducing the overall supply available to NMWD. With this in mind, the Commission projects the overall water supply being reduced up to 14.3% during single-dry years. This reduction

[211] Totals are drawn from NMWD's annual diversion filings with the State Water Resources Control Board covering the water years 2009 to 2013.

aligns with a modification to the present-day production loss calculated by the State Department of Water Resources based on statewide hydrological conditions tied to the 1976-77 drought and detailed in the accompanying footnote.[212] The substantive effect of this drought projection is the annual water supply for the Point Reyes Station system being reduced from its normal/maximum level of 654.0 acre feet to 560.5 acre-feet.

The following table summarizes NMWD's water supply sources for West Marin relative to right/permit allowance, normal year conditions, and drought year conditions.

NMWD's Potable Water Supply Availability – Point Reyes
Listed in Acre-Feet
Table 4-120 (Main LAFCO / NMWD)

Water Source	Day Max From Source	Year Max From Source	Convey Day Max To NMWD	Convey Year Max To NMWD	76-77 Drought Day Max To NMWD	76-77 Drought Year Max To NMWD
	What is Available - legal right -		What is Accessible - normal/max conditions -		What is Accessible - drought conditions -	
Lagunitas Creek - Direct Flows	3.85	654.0	1.86	654.0	1.86	405.5
Lagunitas Creek - Dry-Year Flows / MMWD	0.0	0.0	0.0	0.0	- above -	155.0
Total Yield	**3.85**	**654.0**	**1.86**	**654.0**	**1.86**	**560.5**

LAFCO Calculation To Parallel 1976-77 Drought Conditions

Notes to Water Supply Table – West Marin Water System:

1) NMWD has three separate permits to divert water from Lagunitas Creek; all of which are post-1914 appropriate rights. These permits cover withdraws made by NMWD from its Coast Guard and Gallagher well sites.

2) NMWD's emergency supply agreement with Marin Municipal Water District for up to 250 acre-feet of raw water from Kent Lake is accessed through Lagunitas Creek and diverted by-way of the District's permits with the State Water Resources Control Board. This supply is listed as "dry-year flows" in the above table.

3) NMWD's combined rated capacity at the Coast Guard Well site (420 gallons per minute) would allow the District to draw more than its permitted allowance and total 1.85 acre-feet daily and 675.3 acre-feet annually. Similarly, the rated capacity at the Gallagher Well site (120 gallons per minute) would allow NMWD to further increases its total draw by an additional annual amount of 193.5 acre-feet.

4) Drought year conditions reflect a LAFCO incorporated 38% reduction in water supplies compared to normal/max conditions for NMWD's permitted right to underflow from Lagunitas Creek. This amount is based on a modified version of the Department of Water Resources' calculation for surface supply curtailment for conditions similar to the 1976-77 drought as detailed in this report.

[212] State Water Project Delivery Report (2013) estimates 1976-77 drought-like conditions reduces surface related supplies by 74% of normal/maximum. LAFCO has adjusted this curtailment to 38% on the rationale NMWD's supplies are already incorporate a baseline reduction in total flows in Lagunitas Creek. This assumption also applies to a 38% reduction in the 250 acre-feet of dry-year summer supplies from MMWD.

6.3 Water Treatment Facilities

Novato System

Local Supplies

NMWD treats all raw potable water received from its local surface source (Novato Creek) for the Novato system at its Stafford Treatment Plant. The Stafford Plant was constructed in 1951 and later upgraded in 1973 and again in 2006. It operates seasonally and most frequently during the summer months to help offset demands on pre-treated water imported from the SCWA. The Stafford Plant receives raw water byway of gravity or pumping if needed from an intake tower in Stafford Lake. Standard chemical treatment commences with the addition of chlorine dioxide as a pre-oxidant to reduce naturally occurring organic and non-organic materials in the water before actifloc ballasted flocculation occurs to coagulate and filter organic/inorganic materials. A second application of chlorine is added as finished water exits the Stafford Plant and enters the distribution system. The Stafford Plant's daily treatment capacity is 4,160 gallons a minute and if run continuously results in a daily maximum total of 6.0 million gallons or 18.41 acre-feet. This daily treatment capacity equals 73.4% of the 25.08 acre-feet of permitted water accessibility NMWD can draw from its permitted rights to Novato Creek. This amount – and in terms of stand-alone capacity and irrespective of pretreated water purchased from the SCWA – also equals 40.3% of the Novato system's current peak-day demand of 14.9 million gallons or 45.7 acre-feet.

NMWD treats all raw potable water collected from Novato Creek at its Stafford Treatment Plant. This facility has a treatment capacity of 4,160 gallons a minute, and if run continuously, results in a daily maximum total of 6.0 million gallons or 18.4 acre feet.

Imported Sources

As referenced, all water imported by NMWD from SCWA through the North Marin Aqueduct is pretreated and immediately enters the District's distribution system.

NMWD's Water Treatment Facility – Novato
Table 4-121 (NMWD)

Facility	Primary Chemicals	Daily Treatment Capacity
Stafford Treatment Plant (Novato Creek)	chlorine dioxide chlorine	6,000,000 gallons / 18.4 acre-feet
	Total	**6,000,000 gallons / 18.4 acre-feet**

Point Reyes Station System

NMWD treats all raw potable water received from its local surface source (Lagunitas Creek) for the Point Reyes Station system at its Point Reyes Treatment Plant. The Point Reyes Plant was constructed in 1970 and most recently upgraded in 2007. It operates continually and receives raw water pumped from the adjacent Coast Guard or more recently upstream Gallagher well sites. Standard chemical treatment commences with the addition of potassium permanganate to oxidize iron and manganese in the water, which is then removed through green-sand pressure filters. An application of chlorine (sodium hypochlorite) is added as finished water exits the Point Reyes Plant and enters the distribution system. The finished water is then conveyed into one of three nearby storage tanks (Point Reyes Tanks) or directly to users. The Point Reyes Plant's daily treatment capacity is 486 gallons a minute and if run continuously results in a daily maximum total of 0.7 million gallons or 2.1 acre-feet. This daily treatment capacity equals 45.7% of the 4.6 acre-feet of permitted water accessibility NMWD can draw from its permitted rights to Lagunitas Creek. This amount – and in terms of stand-alone capacity – also accommodates Point Reyes Station system's current peak-day demand of 0.4 million gallons or 1.2 acre-feet.

NMWD treats all raw potable water collected from Lagunitas Creek at its Point Reyes Treatment Plant. This facility has a treatment capacity of 486 gallons a minute, and if run continuously, results in a daily maximum total of 0.7 million gallons or 2.1 acre feet.

NMWD's Water Treatment Facility – Point Reyes
Table 4-122 (NMWD)

Facility	Primary Chemicals	Daily Treatment Capacity
Point Reyes Treatment Plant (Lagunitas Creek)	sodium hypochlorite potassium permanganate	700,000 gallons / 2.14 acre-feet
	Total	**700,000 gallons / 2.14 acre-feet**

6.4 Water Quality

Novato System

NMWD's most recent water quality report for the Novato system for both production from the Stafford Treatment Plant and deliveries from SCWA covering the study period was issued in May 2014 and covers sample testing for 2013. The report is divided into testing for both primary and secondary contaminant levels for treated water as prescribed by the Department of Public Health (DPH); the former addressing public health and the latter addressing taste and appearance. No excessive primary or secondary contaminants were found. No actions were required by DPH.

NMWD's last water quality report for the Novato system shows no excessive primary or secondary contaminants and required no actions by DPH.

Point Reyes Station System

NMWD's most recent water quality report for the Point Reyes Station system covering the study period was issued in May 2014 and addresses sample testing for 2013. The report is divided into testing for both primary and secondary contaminant levels for treated water as prescribed by DPH; the former addressing public health and the latter addressing taste and appearance. No excessive primary or secondary contaminants were found. No actions were required by DPH.

NMWD's last water quality report for the Point Reyes Station system shows no excessive primary or secondary contaminants and required no actions by DPH.

6.5 Distribution System and Storage Facilities

Novato System

NMWD's distribution system for the Novato system consists of approximately 317 miles of mains and overlays four connected pressures zones that jointly cover a 400-foot range in elevation between service connections. The distribution system was originally built in the 1920s by the immediate predecessor to NMWD – Novato Water Company – before its phased replacement by the District beginning in the 1950s and primarily ranges in diameter size of six to twelve inches. The distribution system relies on gravity pressure for recharge from 31 storage tanks that collectively hold 38.4 million gallons or 117.8 acre-feet; the latter amount equaling more than four times the average day demand.[213] There are also 27 pump stations connected to the distribution system conveying water from lower to higher pressure zones and triggered when operating storage levels within individual zones fall below a designated level.

NMWD's potable storage capacity within the Novato distribution system totals 118 acre-feet can accommodate up to 2.4 days of average peak-day demand totals over the study period.

Close to 90% of the Novato system's connections are located within Zones "One" and "Two" and serve development in and around the State Highway 101 corridor. Zone One serves as the initial introduction point for all deliveries from both Stafford and SCWA and accounts for approximately 48% of all connections in the Novato system.[214] Zone One is located at the lowest elevation range within the distribution system and extends roughly between south Petaluma to the north and south to Hamilton Parkway. Zone

[213] NMWD reports the Novato distribution has been entirely replaced over the last 50 years. There are currently 2,618 fire hydrants connected to the distribution system.

[214] The pumping station is presently needed to deliver SCWA entitlements is located adjacent to the Kastania Storage Tank south of Petaluma (Sonoma County) and can convey up to 20.1 million gallons or 61.9 acre-feet per day. The need for the pump station is expected to be eliminated with a planned realignment project set for completion in late 2015. The conveyance, accordingly, will revert to NMWD's contractual limitation for daily supplies from SCWA up to a maximum of 64.1 acre-feet.

Two accounts for approximately 43% of all connections in the Novato system and covers the remaining 101 corridor within NMWD's boundary south to Hamilton and Pacheco Valley areas. The remaining two zones – "Three" and "Four" – account for the remaining 10% of system connections and generally serve higher elevation areas around the City of Novato. A summary description of all four zones follows.

- Zone One serves users from 0 to 60 feet in elevation above sea level and includes the northern State Highway101 corridor area in NMWD and presently represents 48% of the entire Novato distribution system's water connections. Water is conveyed into Zone One directly from Stafford and SCWA and triggered when operating storage levels within the five storage tanks fall below a designated operating level. The combined storage capacity in Zone One totals 13.8 million gallons or 42.5 acre-feet.

- Zone Two serves users from 60 to 200 feet in elevation above sea level and includes the southern State Highway 101 corridor area in NMWD and presently represents 43% of the entire Novato distribution system's water connections. Water is conveyed into Zone Two directly from six dedicated pump stations located in Zone One with a daily conveyance capacity of 5.9 million gallons or 18.4 acre-feet. Pressure in Zone Two is maintained by four primary storage tanks with a combined holding capacity of 16.5 million gallons or 50.6 acre-feet.[215]

- Zone Three serves users from 200 to 400 feet in elevation above sea level and includes the unincorporated Atherton Avenue area and presently represents 8% of the entire Novato distribution system's water connections. Water is conveyed into Zone Three from 14 dedicated pump stations from Zones One and Two with a shared daily capacity of 2.6 million gallons or 8.2 acre-feet. Pressure within Zone Three is maintained by 14 storage tanks with a combined holding capacity of 3.3 million gallons or 10.0 acre-feet.[216]

- Zone Four serves users 400 feet or more in elevation above sea level and includes the area in and around Buck Institute and Upper Wild Horse Valley Road and presently represents 1% of the entire Novato distribution system's water connections. There are four pump stations that convey water directly from Zone Three into Zone Four with a shared daily capacity of 0.3 million gallons or 1.0 acre-feet. Pressure in Zone Four is maintained by three storage tanks with a combined holding capacity of 0.5 million gallons or 1.7 acre-feet.

[215] An additional four tanks are available to Zone Two with a holding capacity of 2.3 million gallons or 7.1 acre-feet to serve isolated areas.

[216] There are also two small pump stations that convey water directly from Stafford into Zone Three with a combined daily capacity of 180,000 gallons or 0.6 acre-feet.

NMWD's Treated Storage Tanks – Novato
Table 4-123 (Marin LAFCO / NMWD)

Pressure Zone	% of Connections	Primary Service Area	Storage Capacity
Zone One	48	North/Central Novato	13,850,000 gallons /42.5 acre-feet
Zone Two	43	South Novato	18,324,000 gallons /56.2 acre-feet
Zone Three	8	Atherton	3,268,000 gallons /10.0 acre-feet
Zone Four	1	Indian Valley	549,500 gallons /1.7 acre-feet
		Total:	**35,991,500 gallons / 110.4 acre-feet**

Point Reyes Station System

NMWD's distribution system for the Point Reyes Station system consists of approximately 24 miles of mains and overlays five connected pressure zones that generally serve distinct unincorporated communities and jointly cover a 1,000-foot range in elevation between service connections. The distribution system was initially built in phases beginning in the 1920s by the immediate predecessors to NMWD in West Marin – Point Reyes Water Company, et al – before its purchase and subsequent replacement beginning in the late 1960s and ranges in principle diameter size of four to eight inches. The distribution system relies on gravity pressure for recharge from 13 storage tanks that collectively hold 1.0 million gallons or 3.2 acre-feet; an amount equaling more than four times the current average day demand. There are also six pump stations connected to the distribution system conveying water from lower to higher pressure zones and triggered when operating storage levels within individual zones fall below a designated level.

NMWD's potable storage capacity within the Point Reyes Station distribution system totals 3.2 acre-feet and can accommodate up to 2.2 days of average peak-day demand totals over the study period.

Close to two-thirds of all connections within the Point Reyes Station system are located within the "Point Reyes Station" Zone. The Point Reyes Station Zone serves as the initial entry point and gatekeeper for all water delivered from Lagunitas Creek by way of the Point Reyes Treatment Plant. The Point Reyes Station Zone is located at the lowest elevation range within the distribution system with pressure maintained by three storage tanks with a combined holding capacity of 0.580 million gallons or 1.8 acre-feet. Separate pump stations directly convey water from the Point Reyes Zone into the "Olema," "Bear Valley," and "Inverness Park" Zones as needed and based on designated storage levels within the individual zones. The fifth zone – "Paradise Ranch Estates" – receives pumped water from the Inverness Park Zone and includes several subzones and reliant on separate pump stations. A summary description of all five zones follows.

- The Point Reyes Station Zone covers approximately 2.11 square miles and presently represents 51% of the entire West Marin distribution system's water connections. Water is conveyed into the Point Reyes Station Zone directly from the Point Reyes Station WTP by gravity and triggered when operating levels within the three storage tanks fall below a designated operating level. The combined

holding capacity of the three tanks within the Point Reyes Station Zone totals 0.580 million gallons or 1.8 acre-feet.

- The Olema Zone covers approximately 0.73 square miles and presently represents 5% of the entire West Marin distribution system's water connections. Water is conveyed into the Olema Zone directly from a dedicated pump station in the Point Reyes Station Zone with a daily conveyance capacity of 0.270 million gallons or 0.8 acre-feet. Pressure is maintained in the Olema Zone by a single storage tank with a holding capacity of 0.150 million gallons or 0.5 acre-feet.

- The Inverness Park Zone covers approximately 2.32 square miles and presently represents 26% of the entire West Marin distribution system's water connections. Water is conveyed into the Inverness Park Zone directly from a dedicated pump station located within the Point Reyes Station Zone with a daily conveyance capacity of 0.223 million gallons or 0.7 acre-feet. Pressure is maintained in the Inverness Park Zone by two storage tanks with a combined holding capacity of 0.136 million gallons or 0.4 acre-feet.[217]

- The Paradise Ranch Zone covers approximately 1.07 square miles and presently represents 14% of the entire West Marin distribution system's water connections. Water is conveyed into the Paradise Ranch Zone directly from a dedicated pump station located within the Inverness Park Zone with a daily conveyance capacity of 0.223 million gallons or 0.7 acre-feet. Pressure is maintained in the Paradise Ranch Zone by four storage tanks with a combined holding capacity of 0.138 million gallons or 0.4 acre-feet.

- The Bear Valley Zone covers approximately 1.23 square miles with connection percent included in the Inverness Park Zone. Water is conveyed into the Bear Valley Zone directly from a dedicated pump station located within the Point Reyes Station Zone with daily conveyance capacities of 0.100 million gallons or 0.3 acre-feet. Pressure is maintained in the Bear Valley Zone by three storage tanks with a combined holding capacity of 0.030 million gallons or 0.1 acre-feet.

NMWD's Treated Storage Tanks – Point Reyes
Table 4-124 (Marin LAFCO / NMWD)

Pressure Zone	% of Connections	Primary Service Area	Storage Capacity
Point Reyes St.	51	Point Reyes Station	580,000 gallons /1.8 acre-feet
Olema	5	Olema	150,000 gallons /0.5 acre-feet
Inverness Park	26	Inverness Park	136,000 gallons /0.4 acre-feet
Bear Valley	- above -	Bear Valley	30,000 gallons /0.1 acre-feet
Paradise Ranch	14	Paradise Ranch	138,000 gallons /0.4 acre-feet
		Total:	**1,034,500 gallons / 3.2 acre-feet**

[217] The Paradise Ranch Zone is further divided into four subzones.

* The remaining 4% of connections in the Point Reyes Station system lie outside NMWD's five formal pressure zones and are dedicated to fire services or outside service users.

6.6 Service Connections

Novato System

NMWD serves 20,492 active water service connections within the Novato system as of term of the study period and divided between 19,058 (93%) residential and 1,434 commercial/business (7%). Connections have been relatively stagnant over the last five year period and have modestly increased in total by 76 or 0.4%. This increase is directly tied to new infill development within NMWD with a majority attributed to three specific projects: Warner Creek Senior Housing; Canyon Green Subdivision; and BioMarin. There are also 33 current water connections tied to the Novato system that lie outside the jurisdictional boundary and are documented in Section 3.4 of this agency profile.

Study Period Trends in NMWD's Water Connections – Novato
Table 4-125 (NMWD)

Category	2009	2010	2011	2012	2013	5-Year Change
Residential	18,987	19,005	19,032	19,056	19,058	0.4%
Commercial	1,429	1,430	1,432	1,434	1,434	0.3%
	20,416	20,435	20,464	20,490	20,492	0.4%

Point Reyes Station System

NMWD serves 776 active water service connections within the Point Reyes Station system as of the term of the study period and divided between 698 (90%) residential and 78 commercial/business (10%). Connections have been relatively stagnant over the last five year period and have slightly increased in total by 17 or 0.2%. This increase is directly tied to new infill development within NMWD. There are also 12 current water connections tied to the Point Reyes Station system that lie outside NMWD's jurisdictional boundary and are documented in Section 3.4 of this agency profile.

Study Period Trends in NMWD's Water Connections – Point Reyes
Table 4-126 (NMWD)

Category	2009	2010	2011	2012	2013	5-Year Change
Residential	684	692	693	699	698	0.2%
Commercial	76	77	77	78	78	0.3%
	760	769	770	777	776	0.2%

6.7 System Demands

Novato System

NMWD's average annual water production demand (metered and losses) over the **study period** within the Novato system has been 2.9 billion gallons or 9,149.8 acre-feet (see footnote 37).[218] The most recent completed year showed total demand at 3.2 billion gallons or 9,796.4 acre-feet. This most recent amount represents an average daily water demand for the entire Novato system of 8.7 million gallons or 26.8 acre-feet; an amount that is further broken down to 426 gallons per day for every active service connection. Per capita use has similarly increased relative to per connections with a study period average of 130 gallons. The peak-day demand – the highest one day sum for the affected year – totaled 45.4 acre-feet and was over two-thirds greater than annualized daily average and results in a peaking factor of 1.69.[219]

> The average annual water production demand in the Novato system over the study period has been 9,150 acre-feet and translates to 399 gallons per day for every active connection. The average daily water demand per resident has been 130 gallons. Overall water demands have increased by 3.8%; an amount that is 10 times greater than the estimated population change in the system over the same period.

With respect to trends, the Novato system has experienced an overall increase of 3.8% in water demand production over the last five year period or 0.8% annually. This overall increase in water demands outpaces the projected change in population in the Novato system over the same time period – 0.08% annually – by ten-fold. This increase in usage appears substantively attributed to weather and economic variations as well as the intensification of uses given the lack of significant new development within the system. Nonetheless, changes in peak-day demands have decreased over the last five year period from 53.3 to 45.4 acre-feet or (14.8%). The following table summarizes overall system demands over the last five years.

Study Period Trends in NMWD's Water Demands – Novato
Table 4-127 (Marin LAFCO / NMWD)

Category	2009	2010	2011	2012	2013	5-Year Average	5-Year Change
Annual Total	9,373.2	8,492.1	8,890.4	9,197.1	9,796.4	**9,149.8**	3.8%
Average Day	25.7	23.3	24.4	25.2	26.8	**25.1**	3.8%
Connections	20,416	20,435	20,464	20,490	20,492	**20,459**	0.4%
Per Day Connection	410g	372g	389g	401g	426g	**399 gallons**	3.9%
Per Day Resident	134g	121g	127g	131g	139g	**130 gallons**	3.7%
Peak Day	53.3	41.1	43.4	47.3	45.4	**46.1**	(14.8%)
Peaking Factor	2.07p	1.76p	1.79p	1.88p	1.69p	**1.84 peaking**	(18.4%)

Year Amounts Shown in Acre Feet Unless Stated Otherwise

[218] Demand includes overall production and incorporates both sales and non-sales (line flushing, system losses, etc.).
[219] The peaking factor varied over the five year period from a low of 41.14 to a high of 53.32.

Going forward – and specifically for purposes of this study – it appears reasonable to assume NMWD's water demands within the Novato system will generally follow trends exhibited over the study period. It is estimated, accordingly and using linear regression to control for large variances in the most recent year-end totals, the Novato system will experience an overall increase in water demand of 440.1 acre-feet over the next 10 years to 2023; a difference of 4.5% or 0.05% annually and a deceleration of more than one-third relative to rises in the last five-year period. It is also estimated the Novato system's peak-day demands will trend consistent with recent amounts and the current five year average peaking factor of 1.8 – which incorporates recent variances as is – will hold through 2023.

LAFCO projects NMWD's annual water demands for the Novato system will increase by 440 acre-feet or 4.5% by 2023; a deceleration in use of more than one-third compared to the study period. The anticipated daily usage is expected to similarly rise to 442 gallons per connection by 2023.

The following table summarizes Commission projections over the next 10 years.

LAFCO Projected Trends in NMWD's Water Demands – Novato
Table 4-128 (Marin LAFCO)

Category	Baseline	2015	2017	2019	2021	2023	10-Yr Change
Annual Total	9,976.4	9,528.9	9,701.2	9,879.6	10,058.1	10,236.5	4.5%
Average Day	26.8	26.1	26.6	27.1	27.6	28.0	4.5%
Peak Day	45.4	48.0	48.9	49.9	50.8	51.5	7.3%
Connections	20,492	20,521	20,549	20,578	20,607	20,636	15.3%
Per Day Connection	426g	415g	421g	429g	436g	442g	3.8%
Per Day Resident	139g	135g	137g	140g	142g	144g	3.6%

Year Amounts Shown in Acre Feet Unless Provided Otherwise
"g" refers to gallons

Notes to LAFCO Projected Trends in Water Demands – Novato System:

1) Projected annual water demand totals calculated by LAFCO using linear regression and based on data collected between 2009 and 2013. Actual calculations will be provided as appendices to final report.

2) Peak day demands assume a flat 1.84 ratio over average day demands based on 2009 to 2013 data.

Point Reyes Station System

NMWD's average annual water production demand (metered and losses) over the **study period** within the Point Reyes Station system has been 83.6 million gallons or 256.6 acre-feet (see footnote 37).[220] The most recent completed year showed total demand at 82.6 million gallons or 253.7 acre-feet. This most recent amount represents an average daily water demand for the entire Point Reyes Station system of 0.226 million gallons or 0.7 acre-feet; an amount that is further broken down to 291 gallons per day for every active service connection. Per capita use has similarly decreased relative to per connections with a study period average of 118 gallons. The peak-day demand – the highest day sum – totaled 1.3 acre-feet and was nearly double the annualized daily average and results in a peaking factor of 1.9.

The average annual water production demand in the Point Reyes Station system over study period has been 257 acre-feet and translates to 297 gallons per day for every active connection. The average daily water demand per resident has been 118 gallons. Overall water demands during this period have decreased by (15.7%). This change, however, is adjusted to an overall increase in demands of 4.6% if eliminating the high-use outlier of 2009 in which usage totaled 301 acre-feet.

With respect to trends, the Point Reyes Station system has experienced an overall decrease of (15.7%) in water demands over the study period or (3.2%) annually. This overall decrease in water demands is substantially less than the projected change in population in the Point Reyes Station system over the same time period – 0.4% annually – by over eight-fold. This large decrease in usage is tied to the closure of a prominent dairy operation at the beginning of the review endpoints and reflected with uses declining by 20% from 301.1 acre-feet in 2009 to 242.5 acre-feet in 2010. This referenced outlier is further substantiated by noting overall uses in the Point Reyes Station system between 2010 and 2013 increased by 4.6% or 1.2% annually. Peak-day demands, however, have remained relatively consistent over the entire five-year period relative to overall usage and averaged a 2.1 ratio over average day usage. The following table summarizes these system demands.

Study Period Trends in NMWD's Water Demands – Point Reyes
Table 4-129 (Marin LAFCO / NMWD)

Category	2009	2010	2011	2012	2013	5-Year Average	5-Year Change
Annual Total	301.1	242.5	243.6	242.2	253.7	**256.6**	(15.7%)
Average Day	0.82	0.66	0.67	0.66	0.70	**0.70**	(14.6%)
Connections	760	769	770	777	776	**770**	0.2%
Per Day Connection	352g	280g	284g	277g	294g	**294 gallons**	(16.5%)
Per Day Resident	140g	111g	113g	110g	117g	**118 gallons**	(16.4%)
Peak Day	1.46	1.34	1.97	1.24	1.23	**1.45**	(15.8%)
Peaking Factor	1.8p	2.0p	1.8p	1.9p	1.8p	**2.1 peaking**	1.6%

Year Amounts Shown in Acre Feet Unless Provided Otherwise
"g" refers to gallons

[220] Demand includes overall production and incorporates both sales and non-sales (line flushing, system losses, etc.).

Going forward – and specifically for purposes of this study – it appears reasonable to assume NMWD's water demands within the Point Reyes Station system will generally follow trends exhibited over the last four years; as referenced above usage in 2009 appears to be an outlier and is therefore omitted from the calculations going forward. It is estimated, accordingly and using linear regression to control for variances in the most recent year-end totals, the Point Reyes Station system will experience an overall decrease in water demand of (4.7) acre-feet over the next 10 years to 2023; a difference of (1.9%) or 0.19% annually. It is also estimated the Point Reyes Station system's peak-day demands will remain flat and trend consistent with recent amounts and the current five year average peaking factor of 2.1 – which incorporates recent variances as is – will hold through 2023. The following table summarizes these Commission projections over the next 10 years for the Point Reyes Station system.

LAFCO projects NMWD's annual water demands for the Point Reyes Station system will decrease by (5) acre-feet or (2%) by 2023; a percentage change of more than double over study period and will result in daily usage declining to 284 gallons per connection by 2023.

LAFCO Projected Trends in NMWD's Water Demands – Point Reyes
Table 4-130 (Marin LAFCO)

Category	Baseline	2015	2017	2019	2021	2023	10-Yr Change
Annual Total	253.7	247.3	247.8	248.4	248.4	249.0	(1.9%)
Average Day	0.70	0.68	0.68	0.68	0.68	0.68	(2.9%)
Peak Day	1.23	1.43	1.43	1.43	1.43	1.43	16.20%
Connections	776	777	777	778	778	779	(0.4%)
Per Day Connection	294g	285g	285g	285g	285g	284g	(3.4%)
Per Day Resident	117g	113g	112g	111g	110g	109g	(6.8%)

Year Amounts Shown in Acre Feet Unless Provided Otherwise
"g" refers to gallons

Notes to LAFCO Projected Trends in Water Demands – Point Reyes Station system:

1) Projected annual water demand totals calculated by LAFCO using linear regression and based on data collected between 2010 and 2013. Actual calculations will be provided as appendices to final report.

2) Peak day demands assume a flat 2.1 ratio over average day demands.

6.8 *Infrastructure Capacities to Demands*

NMWD's two potable water systems are generally operating with available capacities in supply, storage, and treatment as it relates to accommodating existing demands in the Novato and Point Reyes Station areas based on study period averages. These capacities are also generally expected to sufficiently accommodate anticipated demands over the next 10 years with limited – but nonetheless substantive – exceptions for each system. This includes noting annual water supplies for the Novato system under projected single-dry year drought conditions are nearing capacity and projected into a deficit going forward towards 2023. Peak-day demands within the Novato system under projected single-dry year drought conditions also show a current deficit 0.5 million gallons and on pace to increase five-fold to 2.5 million gallons by 2023 and underlies NMWD's

dependency on stored reserves during high-use periods. Infrastructure constraints in the Point Reyes Station area are less prominent but do include dedicated storage within the Paradise Ranch Estates nearing capacity relative to the area's calculated peak-day demand and likely to reach its operating threshold going forward and by 2023.

The following statements summarize and quantify existing and projected relationships between NMWD's capacities and demands within both of the District's system now and going forward to 2023 relative to supply, treatment, and storage. This includes referencing California's Waterworks Standards (Title 22 of the Code of Regulations) and its requirements that all public community water systems have sufficient source, treatment, and storage capacities to meet peak day demand system-wide and within individual zones.

Novato System

Water Supply:

Annual Ratios

- Average annual water production demands generated over the study period represent 41% of NMWD's projected accessible sources for the Novato system under normal conditions. This ratio is expected to rise to 45% by 2023.

- Average annual water production demands generated over the study period represent 87% of NMWD's projected accessible sources for the Novato system under projected single dry-year conditions. This ratio is expected to rise by to near capacity at 97% by 2023.

Peak-Day Ratios

- Average peak-day water production demands generated over the study period represent 53% of the new daily supply available to NMWD and the Novato system under normal conditions. This ratio is expected to rise to 59% by 2023.

- Average peak-day water production demands over the study period represent 105% of the new daily supply available to NMWD and the Novato system under projected single dry-year conditions – or a deficit of (5%). This ratio is expected to rise to a deficit of (17%) by 2023.

Water Treatment:

- Average peak-day water production demands generated over the study period represent 57% of NMWD's existing potable treatment capacities collectively available by Stafford and SCWA. This ratio is expected to rise to 64% by 2023.

Water Storage:

- Average peak-day water projection demands generated over the study period represent 42% of NMWD's existing overall potable storage capacity specific to the Novato system. This ratio is expected to rise to 47% by 2023.

- All four pressure zones within the Novato system have adequate dedicated potable storage in meeting their proportional share of NMWD's average peak day water production demands. No substantive change in these ratios is projected going forward through 2023.

- Overall potable storage capacity in the Novato system allows NMWD to accommodate 2.4 consecutive days of average peak-day production demands without recharge. This capacity is projected to decrease to 2.1 days by 2023.

A summary table grading supply, storage, and treatment capacities relative to current and projected demands to 2023 within NMWD's Novato system is provided below.

NMWD's Capacity Relative to Current Average Demands in Novato
Table 4-131 (Marin LAFCO)

Factor	Sufficient Capacity	Nearing or at Capacity	Insufficient Capacity
Water Supply			
...normal conditions	✓		
...single dry-year conditions			✓
Water Treatment	✓		
Water Storage	✓		

NMWD's Capacity Relative to Projected Demands by 2023 in Novato
Table 4-132 (Marin LAFCO)

Factor	Sufficient Capacity	Nearing or or Capacity	Insufficient Capacity
Water Supply			
...normal conditions	✓		
...single dry-year conditions			✓
Water Treatment	✓		
Water Storage	✓		

Notes to Capacity Tables:

1. Single-dry year conditions assume demands are not adjusted downward given the assumption there is insufficient time during the water year to substantively augment usage patterns through a formal reduction program.

Point Reyes Station System

Water Supply:

Annual Ratios

- Average annual water production demands generated over the study period represent 39% of NMWD's projected accessible sources for the Point Reyes Station system under normal conditions. This ratio is expected to decrease to 38% by 2023.

- Average annual water production demands generated over the study period represent 45% of NMWD's projected accessible sources for the Point Reyes Station system under projected single dry-year conditions. This ratio is expected to decrease to 44% by 2023.

Peak-Day Ratios

- Average peak-day water production demands generated over the study period represent 78% of the new daily supply available to NMWD and the Point Reyes Station system under normal conditions. This ratio is expected to decrease to 77% by 2023. No changes are projected under single-dry year conditions given NMWD's drought-year agreement with MMWD for extra flows from Kent Lake.

Water Treatment:

- Average peak-day water production demands generated over the study period represent 68% of NMWD's existing potable treatment capacity within the Point Reyes Station system. This ratio is expected to decrease to 67% by 2023.

Water Storage:

- Average peak-day water projection demands generated over the study period represent 45% of NMWD's existing overall potable storage capacity in the Point Reyes Station system. This ratio is expected to hold through 2023.

- All five pressure zones within the Point Reyes Station system have adequate dedicated potable storage in meeting their proportional share of NMWD's current-peak day demands. No substantive change in these ratios is projected going forward with the exception of anticipated peak-day uses in Zone Three (Paradise Ranch Estates) likely nearing its dedicated storage capacity by 2023.

- NMWD's overall potable storage capacity in the Point Reyes Station system can accommodate up to 2.2 consecutive days of average peak-day demands without recharge. This ratio is projected to hold through 2023.

A summary table grading supply, storage, and treatment capacities relative to current and projected demands to 2023 within the Point Reyes Station system is provided below.

NMWD's Capacity Relative to Current Average Demands in Point Reyes
Table 4-133 (Marin LAFCO)

Factor	Sufficient Capacity	Nearing or at Capacity	Insufficient Capacity
Water Supply			
...normal conditions	✓		
...single dry-year conditions	✓		
Water Treatment	✓		
Water Storage	✓		

NMWD's Capacity Relative to Projected Demands by 2023 in Point Reyes
Table 4-134 (Marin LAFCO)

Factor	Sufficient Capacity	Nearing or at Capacity	Insufficient Capacity
Water Supply			
...normal conditions	✓		
...single dry-year conditions	✓		
Water Treatment	✓		
Water Storage		✓	

Notes to Capacity Tables:

1. Single-dry year conditions assume demands are not adjusted downward given the assumption there is insufficient time during the water year to substantively augment usage patterns through a formal reduction program.

6.9 Charges and Fees

Novato System

NMWD primarily relies on two distinct billed bi-monthly charges to fund the District's water system within the Novato system in terms of covering both improvements and operations: (a) service and (b) quantity.[221] The service charge is set by Board regulations and is intended to contribute towards fixed costs. The service charge for the Novato system was last updated by the Board in June 2013 and presently assigns a bi-monthly charge of $30 for most users.[222] The quantity charge was last updated in June 2014 and is in tier format to apply an escalating rate based on consumption to cover day-to-day operating costs. The quantity charge applies evenly to inside and outside customers and currently results in the average residential customer paying $134.13 for every two-month billing cycle. This amount is based on the average day usage of 399 gallons and incorporates both the flat service

The current average residential customer in NMWD's Novato system is paying $805 annually in direct water charges based on a daily use of 399 gallons. This produces an approximate ratio of $0.55 for every 100 gallons.

[221] Additional bi-monthly charges are applied to the quantity charge for connections located in upper pressure zones.
[222] The $30 bi-monthly service charge is based on connections no larger than ¾ inches.

charge ($30.00) and variable charge ($134.13). The cumulative cost for most NMWD customers in the Novato system is $805 annually and results in a per 100 gallon equivalent charge of $0.55 based on rates as of January 2015.

NMWD also collects a connection fee for new customers to the Novato system. The fee for a typical single-family residential structure is presently set at $32,580.

Point Reyes Station System

NMWD primarily relies on two distinct billed bi-monthly charges to fund the District's water system within the Point Reyes Station system in terms of covering both improvements and operations: (a) service and (b) quantity. The service charge is set by Board regulation and is intended to contribute towards fixed costs. The service charge for the Point Reyes Station system was last updated by the Board in July 2013 and presently assigns a bi-monthly charge of $30 for most users.[223] The quantity charge was also last updated in July 2014 and is in tier format to apply an escalating rate based on consumption to cover day-to-day operating costs. The quantity results in the average residential customer paying $157.88 for every two-month billing cycle. This amount is based on the average day usage of 294 gallons and incorporates both the flat service charge ($30.00) and variable charge ($127.88). The cumulative costs for most NMWD customers is $947.28 annually and results in a per 100 gallon equivalent charge of $0.88 based on rates as of January 2015.

The current average residential customer in NMWD's Point Reyes system is paying $947 annually in direct water charges based on a daily use of 294 gallons. This produces an approximate ratio of $0.88 for every 100 gallons.

NMWD also collects a connection fee for new customers to the Point Reyes Station system. The fee for a typical single-family residence is presently set at $28,310.

7.0 Agency Finances

7.1 Financial Statements

NMWD prepares financial statements for each fiscal year utilizing the services of a certified public accounting firm. The financial statements are done at the end of the fiscal year on an accrual accounting basis and identify NMWD's total assets, liabilities, and equity. These audited statements provide quantitative measurements in assessing NMWD's short and long-term fiscal health.

[223] The $30 bi-monthly service charge is based on connections no larger than ¾ inches. Residential connections located in Paradise Ranch are charged a $46 bi-monthly service charge..

NMWD / 2012-2013 Financial Statements	
Assets	$121.141m
Liabilities	$40.044 m
Equity	$81.097 m

NMWD's most recent financial statements during the study period were issued for 2012-2013 and shows the District experienced a substantive and positive change to its fiscal standing over the preceding 12 months as its overall equity or fund balance increased by just over 6% from $76.061 to $81.097 million. This increase in the overall fund balance appears directly tied to an operating surplus that was facilitated by the implementation of a rate increase to service and quantity charges coupled with higher usage. A summary of year-end totals and corresponding trends over the study period follows.

Agency Assets

NMWD's audited and overall assets at the end of 2012-2013 totaled $121.141 million and have increased over the preceding five year period. Assets classified as current with the expectation they could be liquidated within a year represented close to one-eighth of the total amount with the majority tied to capital grants, loans, cash and cash equivalents. Assets classified as non-current represented the remaining seven-eighths, with the largest portion associated various capital assets with the single largest valued item being the water distribution systems booked at $68.1 million.

NMWD Assets | Study Period
Table 4-135 (Marin LAFCO / NMWD)

NMWD Assets	2008-09	2009-10	2010-11	2011-12	2012-13	5-Year Change
Current Assets	9.438	6.873	6.311	18.315	16.390	73.6
Non-Current Assets	88.184	88.163	86.037	96.343	104.751	18.8
	$97.623	$95.037	$95.348	$114.659	$121.141	24.1%

amounts in millions

Agency Liabilities

NMWD's audited and overall liabilities at the end of 2012-2013 totaled $40.044 million and have increased by nearly two-thirds over the preceding five year period. Current liabilities representing obligations owed within a year accounted for the nearly 10% of total amount, and primarily tied to accounts payable and loan repayments. NMWD's non-current liabilities make up the other 90% and are primarily tied to long term loan repayment and highlighted by an outstanding $13.4 million loan balance from the Department of Water Resources dating back to 2005 and tied to the reconstruction of the Stafford WTP.

NMWD Liabilities | Study Period
Table 4-136 (Marin LAFCO / NMWD)

NMWD Liabilities	2008-09	2009-10	2010-11	2011-12	2012-13	5-Year Change
Current Liabilities	3.450	2.244	2.355	4.746	3.771	9.3
Non-Current Liabilities	20.889	20.128	19.699	33.851	36.273	73.6
	$24.340	$22.372	$22.054	$38.597	$40.044	64.5%

amounts in millions

Agency Equity / Net Assets

NMWD's audited equity / net assets at the end of 2012-2013 totaled $81.097 million and represent the difference between the District's total assets and total liabilities. This amount has increased by just over ten percent over the five previous fiscal years. The end of year equity amount incorporates a $13.071 million or 16.1% in unrestricted funds that has increased by nearly two-thirds over the preceding five year period and attributed to increased water rates beginning in 2011-2012.

NMWD's unrestricted fund balance total of $13.0million equates to a per capita reserve amount of $202 as of the term of the study period.

NMWD Equity
Table 4-137 (Marin LAFCO / NMWD)

NMWD Equity	2008-09	2009-10	2010-11	2011-12	2012-13	5-Year Change
Unrestricted	7.921	6.462	6.579	11.185	13.071	65.0
Restricted	4.304	5.332	3.171	2.993	2.186	(49.2)
Capital	61.057	60.880	63.542	61.882	65.839	7.8
	$73.283	**$72.674**	**$75.293**	**$76.061**	**$81.097**	**10.7%**

amounts in millions

7.2 Liquidity, Capital, and Profitability

A review of the financial statement issuances by NMWD covering the study period shows the District generally improved its economic standing, highlighted by improved liquidity and profitability. This includes NMWD expanding the value of near-term assets over near-term liabilities by almost 60% and finishing the review period with sufficient resources to cover immediate debts – like payroll and interest payments – by a ratio of over four-to-one. NMWD also incrementally eliminated a persistent operating deficit by the end of the five year period with the aid of the District enacting three consecutive 11% annual increases to user rates beginning in 2011. NMWD did experience, nonetheless, a significant decrease in capital as a result of new long-term debt obligations and marked by finishing with a relatively high debt-to-equity ratio of 45%. A summary of year-end liquidity, capital, and operating margin ratios as of July 1, 2013 are show in the following table.

Study Period Trends in NMWD Liquidity, Capital, and Margin
Table 4-138 (Marin LAFCO)

Fiscal Year	Current Ratio (Liquidity)	Debt-to-Net Assets (Capital)	Operating Margin (Profitability)
2008-2009	2.735 to 1	0.285	(82.00)
2009-2010	3.063 to 1	0.277	(28.17)
2010-2011	2.679 to 1	0.269	(8.19)
2011-2012	3.859 to 1	0.445	(2.71)
2012-2013	4.346 to 1	0.447	10.95
Averages	**3.336 to 1**	**0.349**	**(22.0%)**
5-Year Trend	**58.9%**	**56.9%**	**n/a**

7.3 Pension Obligations

NMWD provides a defined benefit plan to its employees through an investment risk-pool contract with the California Public Employees Retirement Systems (CalPERS). This contract provides eligible employees with retirement and disability benefits, annual cost-of-living adjustments, and death benefits to members and their beneficiaries. NMWD maintains two contract packages – termed "Tier One" and "Tier Two" – for employee pensions based on the date of hire. Tier One is based on a 2.5% at 55 formula and would provide an eligible retiree with 20 years of total service credit 50% of their highest year salary beginning at age 55 and continuing each year thereafter until death. Tier Two is based on a 2.0% at 62 formula and would provide an eligible retiree with 20 years of total service credit 40% of their highest three years of salary beginning at age 62 and continuing each year thereafter until death.

NMWD's Defined Pension Benefit Tiers
Table 4-139 (CalPERS)

Category	Miscellaneous
Tier One (Pre January 2013)	2.5% at 55
Tier Two (Post January 2013)	2.0% at 62

Note:
All tiers provide up to a 2.0% annual cost-of-living adjustment

Funding contributions for NMWD are based on employee salary totals and determined each year through actuarial estimates determined by CalPERS and separate from any cost-sharing arraignments between the District and its employees. A listing of recent and planned minimum contribution rates for NMWD as determined by CalPERS along with enrollee information follows.

NMWD's Minimum Contribution Rates to CalPERS
Table 4-140 (Marin LAFCO / CalPERS)

11-12	12-13	13-14	14-15	15-16	Change
18.15	19.95%	20.04%	15.70%	19.20%	5.79%

Projected

NMWD's Pension Enrollee Information
Table 4-141 (CalPERS)

Enrollee Type	As of June 30, 2013
Active	50
Transferred	7
Separated	13
Retired	59

NMWD's total annual pension contributions are on the rise in step with increasing liability based on available information spanning the 2010-2011 and 2012-2013 fiscal years; the latter of which is the most recent fiscal year published by CalPERS. NMWD has increased its total annual pension contributions by 17% from $0.913 million to $1.068 million over the span of the three affected fiscal years and exceeds the corresponding inflation factor for the San Francisco Bay area region during this period of 5.0% by over three-fold. This increase in contributions is helping, albeit modestly and proportionally less than the rise in contributions, to improve NMWD's funded status – the difference between the pension plan's assets and liabilities – during this window with the current ratio at 71.7% (market) and 80.1% (actuarial). NMWD's unfunded liability – pension monies owed that are not covered by assets – nonetheless has continued to increase and highlighted by the market value rising 7.4% over the three year period to $10.249 million; an amount that equals 78.4% of the District's current unrestricted fund balance as of the start of 2013-2014.[224] NMWD's worker-to-retiree ratio has also decreased by nearly one-fifth over the three-year period from 1.0 to 0.84; all of which means it is reasonable to assume employer and employee contributions will need to increase to simply maintain existing debt levels.

NMWD's unfunded pension liability has increased over the last three reported years and currently totals $10.249 million; an amount that that equals 78.4% of the District's unrestricted fund balance as of the start of 2013-2014.

NMWD Trends in Pension Measurements
Table 4-142 (Marin LAFCO / NMWD)

Category	2010-2011	2011-2012	2012-2013	Difference
NMWD Annual Contribution	$.913 million	$1.031 million	$1.068 million	17.0%
Funded Ratio – Market	71.3%	67.3%	71.7%	0.6%
Unfunded Liability - Market	$9.566 million	$11.304 million	$10.249 million	7.4%
Funded Ratio – Actuarial	79.6%	80.1%	n/a	-
Unfunded Liability -Actuarial	$6.782 million	$6.893 million	n/a	-
Active to Retiree Ratio - active employees for every retiree	1.0	0.96	0.84	(16.0%)

Notes:

1) Market (MVA) measures the immediate and short term values of the pension with respect to assets and liabilities (i.e., here and now).
2) Actuarial (AVA) measures the progress toward fully funding future pension benefits for current plan participants (i.e., where the pension will be in 15 to 30 years.) CalPERS no longer calculates AVA measurements as of the 2012-2013 fiscal year.

[224] NMWD's undesignated fund balance (audited) as of June 30, 2013 totaled $13.071 million.

7.4 Revenue and Expense Trends

NMWD has experienced revenue deficits in four of the five fiscal years covering the study period with an overall five-year average annual shortfall of ($2.796) million or (19%). Annual revenues over this period have averaged $14.942 million with nearly 94% of this amount drawn from water sales. Annual expenses over the same period, conversely, have averaged $17.739 million and were led by purchasing water from SCWA (24.6%) and depreciation of capital assets (27%). The relationship between NMWD's revenues and expenses, however, is improving and highlighted by a surplus in the final year of the review period. This positive trend is further highlighted by overall revenues increasing by 41% while expenses have decreased by (31%).

NMWD has experienced revenue deficits in four of the five years covering the study period. This trend, however, is improving with revenues increasing by 41% while year-end expenses have decreased by (31%) over the study period.

A summary of the five-year averages within both revenue and expense ledgers follows.

Study Period Trends in NMWD Revenues
Table 4-143 (Marin LAFCO / NMWD)

Category	Five Year $ Average (2008-09 to 2012-13)	% of Total	Five Year % Change (2008-09 to 2012-13)
Property Taxes	0.098	0.7	(15.0)
Water Charges	14.046	93.9	45.0
Sewer Charges	0.152	1.0	6.8
Other Service Charges	0.343	2.3	100.6
Investments/Interest	0.187	1.4	(80.5)
Other	0.115	0.8	19.4
	$14.942	**100%**	**41.1%**

Study Period Trends in NMWD Expenses
Table 4-144 (Marin LAFCO / NMWD)

Category	Five Year $ Average (2008-09 to 2012-13)	% of Total	Five Year % Change (2008-09 to 2012-13)
SCWA Water Purchases	4.361	24.6	34.9
Water Pumping	0.318	1.8	3.7
Water Operations	0.657	3.7	23.8
Water Treatment	1.910	10.8	11.5
Water Distribution	2.379	13.4	0.2
Sewer Collection/Treatment	0.107	0.6	29.6
General Administration	2.183	12.3	(18.2)
Projects/Conservation	1.024	5.8	(87.0)
Other/Depreciation	4.794	27.0	(66.9)
	$17.739	**100%**	**(31.0%)**

12

ITEM #12

MEMORANDUM

To: Board of Directors

January 15, 2016

From: David L. Bentley, Auditor-Controller
Drew McIntyre, Chief Engineer

Subj: West Marin Water Outside District Water Consumption (2011-2015)
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RECOMMENDED ACTION: None - Information Only

FINANCIAL IMPACT: None

Periodically the Board receives an update on water service provided to customers residing outside the West Marin Water Service and/or Improvement District boundaries. The last report for 2011-2013 water use was provided to the Board at the June 17, 2014 meeting. There are 13 customers residing outside District boundaries (see map in Attachment A). Cumulatively they comprise 7% of the total West Marin potable water demand over the last five years.

Six of the outside boundary customers (Bianchini, Giacomini, Mendoza, Doughty, Martinelli (PRNS) and S. Martinelli, receive water via a private service line in State Route 1 connected to a District inter-tie established by the District in 1990. At the February 7, 1990 meeting, the Board approved the aforesaid metering arrangement for a segment of the old Downey line in Pt. Reyes, which is an unusual arrangement inherited by the District at the time it acquired the Downey water system. The private lines and facilities are not built to District standard and therefore the District cannot accept any liability for providing service. Comparing the volume through the master-meter to the cumulative volume through the individual sub-meters reveals a cumulative variance of 1.3% over the past five years, which is within meter accuracy tolerance.

These West Marin outside customers are subject to a commodity rate that is 40% higher[1] than the rate paid by customers residing within District boundaries. This additional charge is levied to compensate for the fact that outside boundary customers did not pay any PR-3 General Obligation bond[2] tax levied exclusively on property within the Improvement District boundary.

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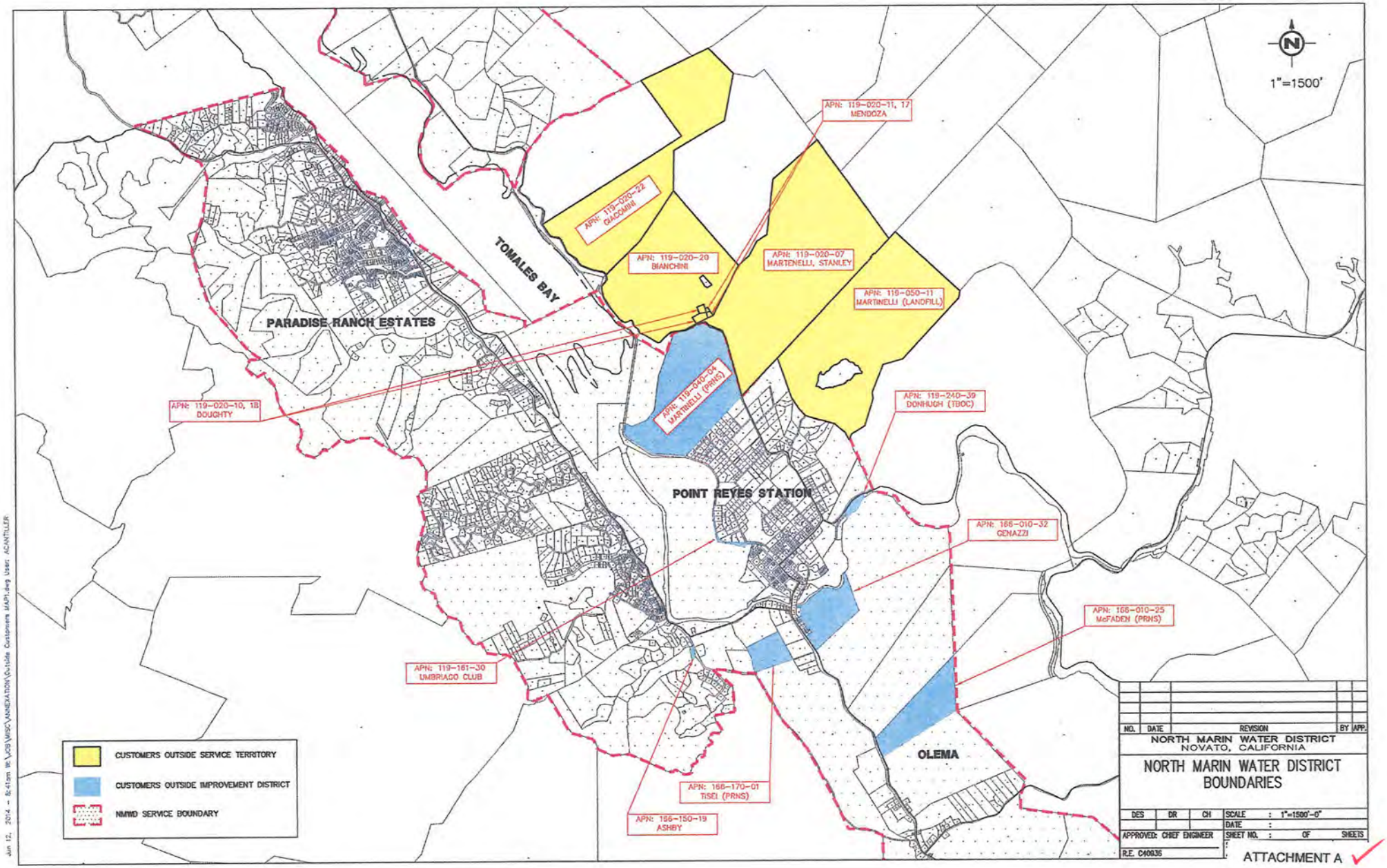
[1] When the higher Seasonal Rate is in effect, outside non-residential customers pay a commodity rate that is 29% higher than non-residential customers residing within the Improvement District boundary.

[2] The PR-3 GO Bond was fully amortized in 2013.



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DISBURSEMENTS - DATED JANUARY 7, 2016

Date Prepared 12/29/15

The following demands made against the District are listed for approval and authorization for payment in accordance with Section 31302 of the California Water Code, being a part of the California Water District Law:

Seq	Payable To	For	Amount
1	All Star Rents	Propane (32 gal) (STP)	$114.06
2	Anderson, Roger	Novato "Cash for Grass" Rebate Program	270.00
3	Automation Direct	PLC Replacement Parts for Reservoir Hill Tank	719.00
4	Backflow Distributors	Repair Parts for DCDA's	633.29
5	Baker, Jack	December Director's Fee ($410) & North Bay Watershed Association Meeting on 12/4/15	615.00
6	Bay Area Barricade Service	Reflective Tape for Fire Hydrant Bollards (2 rolls-2"x10 yds)	59.01
7		Cafeteria Plan: Uninsured Medical Reimbursement	280.50
8	Bold & Polisner	AEEP Caltrans Reimb- Bl ($37), Gallagher Well #2 ($389), Giacomini Rd Home ($463), Novato Creek Water Rights ($167), Potter Valley Relicensing ($78), Prop 218 Letter ($37), Public Records Act ($211) & RW Expansion Financing ($74)	1,454.50
9	Bolles, Janice	Novato "Toilet Rebate" Program	100.00
10	Cain, Morgan	Novato "Washer Rebate" Program	50.00
11	CalPERS	Health Insurance Premium (Employees $55,790, Retirees $10,190 & Employee Contribution $11,845)	77,825.30
12	Cao, David	Novato "Toilet Rebate" Program	100.00
13	Cardno	Progress Pymt#1: Consulting Services for NMFS Draft Coastal Multi-Species Recovery Plan (Balance Remaining on Contract $3,510)	1,490.00
14	Castellucci, Peter	Novato "Cash for Grass Rebate" Program	400.00
15	Clean Waste	Brief Relief Urine Bags (300)	306.00

Seq	Payable To	For	Amount
16	Dayiantis, Niki	Novato "Washer Rebate" Program	50.00
17	Environmental Resource Assoc	Performance & Reference Samples (Lab)	123.18
18	Environmental Science Assoc	Prog Pymt#42: Engineering Services - RW Expansion Project (Balance Remaining on Contract $17,852)	4,090.91
19	Fraites, Rick	December Director's Fee ($410) & Novato Watershed Program Policy Advisory Committee on 11/19/15	615.00
20	Golden Gate Petroleum	Gas ($2.21/gal) & Diesel ($2.19/gal)	1,795.26
21		Cafeteria Plan: Uninsured Medical Reimbursement	207.68
22	Gorski, Lawrence	Novato "Toilet Rebate" Program	300.00
23	Grainger	Pipe Thread, Air Filter for Hydropneumatic Tank Servicing ($230), Compound Pressure Gauge, Grease Gun ($201), Pressure Washer Nozzle & Hose Coupling ($117), Blaster Media (4) ($167), Screw Tip & Hex Socket Driver Set (2)	836.83
24	Groeniger	Check Valve (2)	1,144.50
25	Hardy Diagnostics	Bacteria Growth Media (1,000g) (Lab)	155.52
26	HUB International	Holiday/Retirement Party Insurance	107.40
27	International Fire	Annual Fire Extinguisher Service (Budget $2,000)	1,616.72
28	ITRON Service Center	2016 Annual Hardware Maintenance on Meter Reading Devices (Budget $1,520)	1,534.14
29	Lincoln Life	Deferred Compensation PPE 12/31/15	13,837.14
30	McLellan, WK	Misc Paving	5,478.07
31	Millar, Robert	Novato "Cash for Grass" Rebate Program	400.00
32	Nationwide Retirement Solution	Deferred Compensation PPE 12/31/15	1,900.00
33	Novato Sanitary District	September ($10,253) & October Recycle Water Operating Expense ($10,912)	21,165.05
34	Pace Supply	Corp Stops (6) ($249) & 4" Flange Gaskets (10)	271.32

Seq	Payable To	For	Amount
35	Pape Machinery	Power Relays (2) & Fire Resistor	60.49
36	Petterle, Stephen	December Director's Fee	410.00
37	PG&E	Power: Bldgs/Yard ($3,308), Rectifier/Controls ($401), Pumping ($19,000), Treatment ($134) & Other ($103)	22,947.52
38	Pumping Solutions	Construction Air Pump Exhaust Muffler	118.96
39		Cafeteria Plan: Childcare Reimbursement	133.92
40	Red Wing Shoe Store	Replacement Check - Original Lost in Mail	956.67
41	RMC Water & Environment	Prog Pymt#5: RW Production Evaluation & #6: Central Service Area Connection @ STP (Balance Remaining on Contract $4,381)	14,290.00
42	Rodoni, Dennis	December Director's Fee	410.00
43	Schoonover, John	December Director's Fee Less Deferred	360.00
44	Semple Appraisals	Appraisal of Proposed Recycled Water Easement in Common Area (Villa Entrada)	4,000.00
45	Soiland	Drain Rock (64 tons)	1,414.90
46	Stiveson, Dixie	Replacement Check - Original Lost	300.00
47	Tong, Cindy	Novato "Toilet Rebate" Program	300.00
48	United Parcel Service	Delivery Services: Sent Gas Monitor in for Repair	15.53
49	U.S. Bank Credit Card	Facebook Conservation Messages ($500), Registration for AWWA Exam (Garrett) ($180), Phone Charger ($8) (Cons Svcs), Craigslist-Ad for Cross Connection Asst ($75), Retirement Photo Album($71), Slide Assembly for Generator ($205) & Marin I.J. - Solicitation for On-call Construction Services ($470)	1,509.12
50	Vali Cooper & Associates	Progress Pymt#20: Construction Management Services for AEEP Reaches A-D/MSN B3 Project (Balance Remaining on Contract $9,019)	46,698.83

Seq	Payable To	For	Amount
51	Van Bebber Bros	Steel Sheets for Shelving (3-21" x 34")	144.67
52	Visconte, Richard	Novato "Toilet Rebate" Program	100.00
		TOTAL DISBURSEMENTS	**$234,215.99**

The foregoing payroll and accounts payable vouchers totaling $234,215.99 are hereby approved and authorized for payment.

Auditor-Controller Date 1/5/16

General Manager Date 1/5/2016

DISBURSEMENTS - DATED JANUARY 14, 2016

Date Prepared 1/12/16

The following demands made against the District are listed for approval and authorization for payment in accordance with Section 31302 of the California Water Code, being a part of the California Water District Law:

Seq	Payable To	For	Amount
P/R*	Employees	Net Payroll PPE 12/31/15 & Final Paychecks (Stafford & Ochoa)	$127,475.04
EFT*	US Bank	Federal & FICA Taxes PPE 12/31/15	57,195.46
EFT*	State of California	State Taxes & SDI PPE 12/31/15	9,975.84
EFT*	CalPERS	Pension Contribution PPE 12/31/15	33,054.71
1	Able Tire & Brake	Tires (6) ('08 Ford F350)	1,399.30
2	Athens Administrators	Replenishment for Workers' Compensation Checks Written (12/1/15-12/31/15)	977.75
3	AT&T	Internet Service at PRTP (11/20-12/19)	75.00
4	AT&T	Leased Lines	535.52
5	Badger Meter	Monthly Cellular Meter Charge (12)	10.56
6	Bay Area Barricade Service	Metal Signs (6) ("Receiving, 5MPH, Do Not Use, & Turn Vehicle Off Before Fueling")	179.86
7	Bay Alarm	Quarterly Fire Alarm Monitoring Fee (STP) (1/1/16-4/1/16)	338.19
8	Building Supply Center	Primer (8oz)	8.13
9		Vision & Cafeteria Plan: Uninsured Medical Reimbursement	465.00
10	Clark, Robert E.	Exp Reimb: Lunch for Water System Leak Response Seminar (24)	188.50
11	Cole-Parmer Instrument	Test Tube Brushes (12) (Lab)	45.58
12	Dell Computers	Replacement Server	5,277.48
13	Farwest Corrosion Control	Epoxy Paint for Underground Steel (1 gal)	219.12
14	Fritz, James	Supplemental Payment for Retiree Health Insurance 2/15-12/15.	997.59

Seq	Payable To	For	Amount
15	Golden Gate Petroleum	Tellus Oil (10 gal) ($192), Grease (9 gal) (STP), Gas ($2.29/gal) & Diesel ($2.02/gal)	894.98
16	Grainger	Drill Bit Set, Lint Free Wipes (1,250) ($84), Male Connectors (2) ($91) & Sump Pump ($228) (Less Credit of $72 for Returned Part)	361.38
17	Habitat for Humanity	Refund of RW Load Security Deposit Less Charge for 1 Recycled Water Load	95.00
18	Harrington Industrial Plastics	Pump Parts (4) (STP)	294.14
19	Industrial Scientific	Gas Monitor Oxygen Sensor Replacement	207.72
20		Vision & Cafeteria Plan: Uninsured Medical Reimbursement	124.65
21	Maltby Electric	Telemetry Sealing Compound ($1,007), Electrical Supplies for Landfill Rectifier ($108) & Outdoor Cat5 Cable for Radio Telemetry Project ($281)	1,396.56
22	Marin Landscape Materials	Weed Barrier Fabric (450') ($98) & 3/8" & 1/2" Rebar	111.78
23	Marin County Recorder	November Official Record Copy (7)	38.00
24	Microtech Scientific	Bacterial Growth Medium (Lab)	64.55
25	North Marin Auto Parts	Small Engine Oil Filters (6), Wireloom (20') ($57), Circuit Breaker, Battery Cable (20') & Hydraulic Oil (2)	102.46
26	North Bay Gas	Nitrogen ($98) & Dec Cylinder Rental	141.50
27	Novato Builders Supply	Bright Spikes (8), Caulk (3) & Paint (2)	35.31
28	Novato, City of	Street Excavation Moratorium Fee (2 Norma Ct)	500.00
29	Novato Chevrolet	Lamp Assembly ('06 Chevy Colorado)	93.08
30	O'Reilly Auto Parts	Glass Cleaner (76oz), Wiper Fluid (32oz), Engine Oil (9 gal) ($176) & Interior Cleaner (2-16 oz Bottles	220.39
31	Pace Supply	Repair Clamps (2) (6" x 2") ($588), Elbows (8)($470), Bushing, Nipples (36) ($2,186), 6" Pipe (100') ($490), Couplings (55) ($649), Valves (7) ($1,608) & Adaptors (3)($260)	6,308.00

Seq	Payable To	For	Amount
32	Pape Machinery	AC/Heater Blower Motor ($481) ('09 JD Backhoe), Relay & Resistors (2) ($219)	743.07
33	PES Environmental	Progress Pymt #3: Groundwater Exploration @ Gallagher & Osborn Ranches (Balance Remaining on Contract $30,973)	3,408.25
34	Pini Hardware	Bedroom Door Handle ($45) (25 Giacomini Rd), Fertilizer (4 lbs), Telephone Jack Supplies, Pipe Insulation, Electrical Box & Cover, 1/4" Hose Barb, Pop-up Sprinkler, Broom, Carbon Monoxide Detector (25 Giacomini Rd) ($31), Rubber Coating Spray, Copper Tubing, Outlet Covers (2), Keys (3), Mouse Bait, Hoses (2) (Lab), Drive Socket Adaptor, Pipe Nipple, Bushing, Foam Filler, Copper Pipe Fittings, Conduits (3), Elbows (4) & J Box	322.81
35	Protection Engineering	Zinc Anodes (800lb)	5,559.00
36	Roy's Sewer Service	Emergency Service at Oceana Marin on Thanksgiving Day	1,350.00
37	Sebastopol Bearing & Hydraulic	Fabricate 2 Hydraulic Hoses	108.62
38	Sequoia Safety Supply	Safety Gloves (200)	197.29
39	Shirrell Consulting Services	December Dental Expense	3,369.00
40	Shoemaker Structural	Welding Services	275.00
41		Vision Reimbursement	184.00
42	State Water Resources Control	Water Distribution Certification Test Fee (Barrilleaux)	50.00
43	Talley Communications	Radio Telemetry Cable Ends (12)	136.89
44	TelePacific Communications	Telephone Charges (Dec)	612.41
45	United Parcel Service	Delivery Service: Sent Chlorine Scrubber Media for Testing & Solar Controller Sent in for Repair	28.02
46	Verizon California	Leased Line	877.12
47	Verizon Wireless	Cellular Charges: Data ($110) & Airtime ($92) (19)	201.10

Seq	Payable To	For	Amount
48	Verizon Wireless	Dec CIMIS Station Data Transfer Fee	34.21
49	ZFA Structural Engineers	Fox Drive Bridge Water Pipe Design	1,395.20
		TOTAL DISBURSEMENTS	**$40,559.07**

The foregoing payroll and accounts payable vouchers totaling $40,559.07 are hereby approved and authorized for payment.

Auditor-Controller — Date 1/12/16

General Manager — Date 1/12/2016

MEMORANDUM

To: Board of Directors January 15, 2016

From: David L. Bentley, Auditor-Controller

Subj: Self-Insured Workers' Comp – 2nd Quarter Status Report
t:\ac\word\personnel\wc\self ins status 1215.docx

RECOMMENDED ACTION: None

FINANCIAL IMPACT: Cumulative Savings of $599,141

The District returned to self-insuring its workers compensation liability effective July 1, 2011, after the low-cost proposal for first-dollar workers' compensation coverage increased 20% over the prior year, to $159,331. The avoided-cost since returning to self-insurance is calculated at $549,150. When the Reserve for Future Medical (which is money not yet paid out) is added, the total cash outlay avoided to date, including interest earned on the cost avoided, is $599,141. This cash is set-aside in a reserve for future claims.

Through the first half of FY16, the District incurred no claims. Attached are charts showing a 10-year history of annual claims cost (average $30,000 per year) and 10-year history of claims frequency (average 8 claims per year).

	FY12	FY13	FY14	FY15	FYTD16	Cumulative
Premium Avoided	$159,331[1]	$170,574[2]	$311,764[3]	$203,722[4]	$106,068[5]	$951,459
Self-Insurance Cost						
Medical/Indemnity Cost	(10,237)	(20,131)	(77,825)	(2,780)	0	(110,973)
Third Party Administration	(12,000)	(12,000)	(12,000)	(12,000)	(6,000)	(54,000)
Excess Insurance Premium	(45,546)	(47,762)	(49,276)	(50,708)	(26,814)	(220,106)
Legal/Miscellaneous	0	0	(13,236)	(1,048)	(2,946)	(17,230)
Net Cost Avoided	$91,548	$90,681	$159,428	$137,186	$70,307	$549,150
Reserve for Future Medical	0	0	42,035	0	0	42,035
Total Cash Outlay Avoided	$91,548	$90,681	$201,463	$137,186	$70,307	$591,185
Interest on Cost Avoided	36	9	1,433	3,953	2,525	7,956
Annual Savings	$91,584	$90,690	$202,896	$141,139	$72,832	$599,141

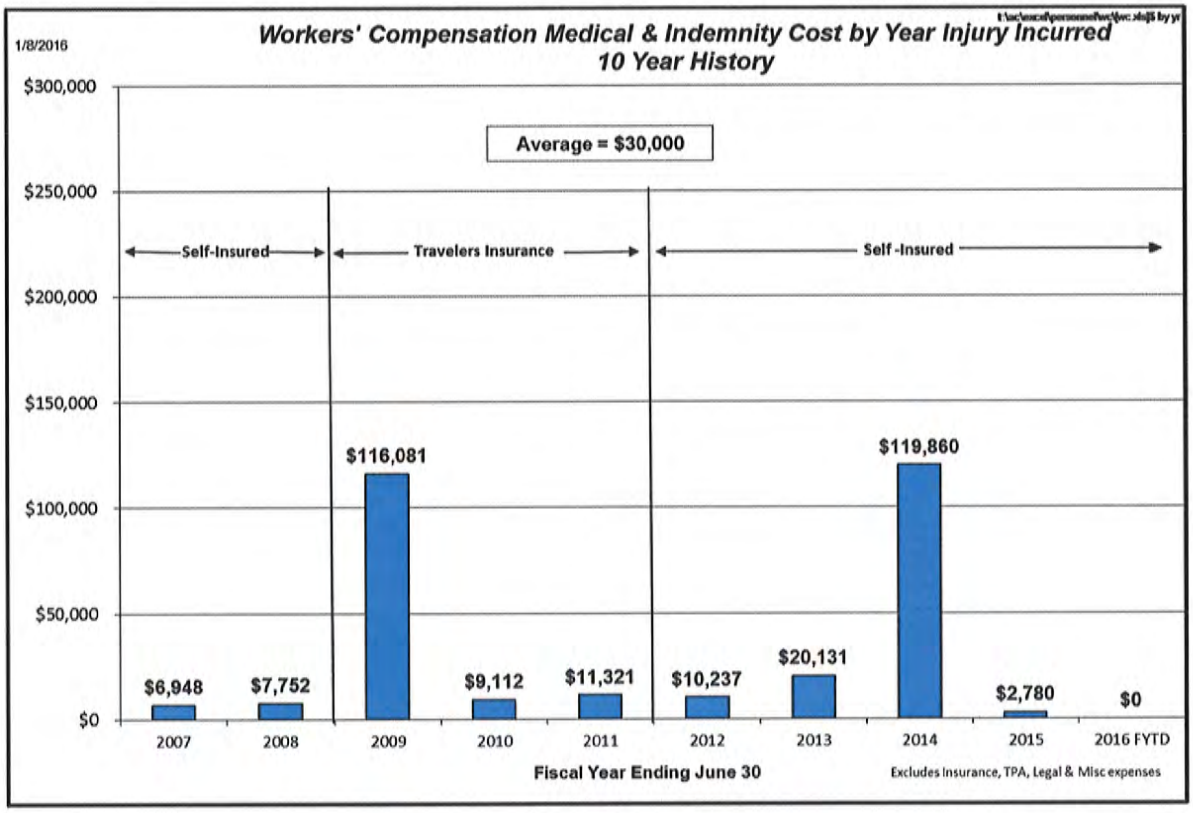
[1] Travelers Insurance proposed an annual premium of $159,331.

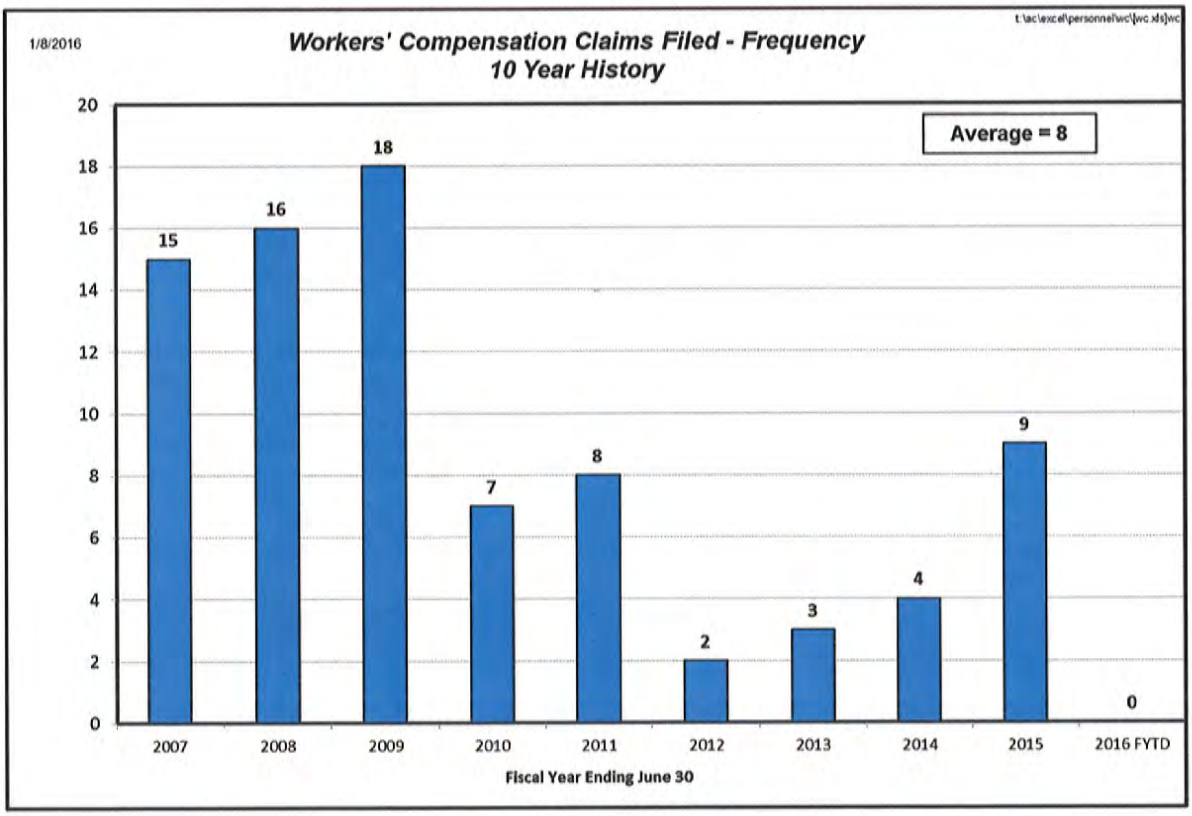
[2] Unable to obtain a quote. Annual premium of $170,574 was based on a 6.5% industry average increase estimated by broker.

[3] Chartis Insurance was the low cost proposal with an annual premium of $311,764.

[4] Alaska National Insurance Company was the low cost proposal with an annual premium of $203,722.

[5] New York Marine and General Insurance Company was the low cost proposal with an annual premium of $212,135.


1/8/2016
Workers' Compensation Medical & Indemnity Cost by Year Injury Incurred
10 Year History
$300,000
$250,000
$200,000
$150,000
$100,000
$50,000
$0
Average = $30,000
Self-Insured
Travelers Insurance
Self -Insured
$6,948
$7,752
$116,081
$9,112
$11,321
$10,237
$20,131
$119,860
$2,780
$0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016 FYTD
Fiscal Year Ending June 30
Excludes Insurance, TPA, Legal & Misc expenses


1/8/2016
Workers' Compensation Claims Filed - Frequency
10 Year History
20
18
16
14
12
10
8
6
4
2
0
Average = 8
15
16
18
7
8
2
3
4
9
0
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016 FYTD
Fiscal Year Ending June 30

MEMORANDUM

To: Board of Directors January 15, 2016

From: David L. Bentley, Auditor-Controller

Subj: Information – Renewal of Oceana Marin Liability Insurance
t:\ac\word\insurance\16\om liability ins purchase 16.docx

RECOMMENDED ACTION: Information

FINANCIAL IMPACT: $1,887 Expense for Oceana Marin Sewer

The 2016 premium for Oceana Marin sewer improvement district's $1 million liability insurance policy is down 11% ($240) from 2015. This coverage is provided via the California Sanitation Risk Management Authority (CSRMA), a Joint Powers Authority that also provides coverage for the sanitary districts in Novato, Central Marin, Las Gallinas, San District's 1&5, Sausalito-Marin City, San Rafael, and the Sewerage Agency of Southern Marin. $2,000 was budgeted for this purchase.

Note from the attached chart that Oceana Marin's insurance premium decreased significantly in 2010, and continues at a moderate level. CSRMA changed carriers two years ago to Allied World Assurance Company based on their more competitive proposal than the prior carrier. The Allied policy retains the limit of $1 million per occurrence and $3 million aggregate, but includes a $1,000 deductible, compared to zero deductible with the previous policy.

Allied World Assurance Company carries an A.M. Best Rating of A XV. The A indicates excellent financial strength, and the XV indicates financial size is the largest rated (>$2 billion statutory surplus).

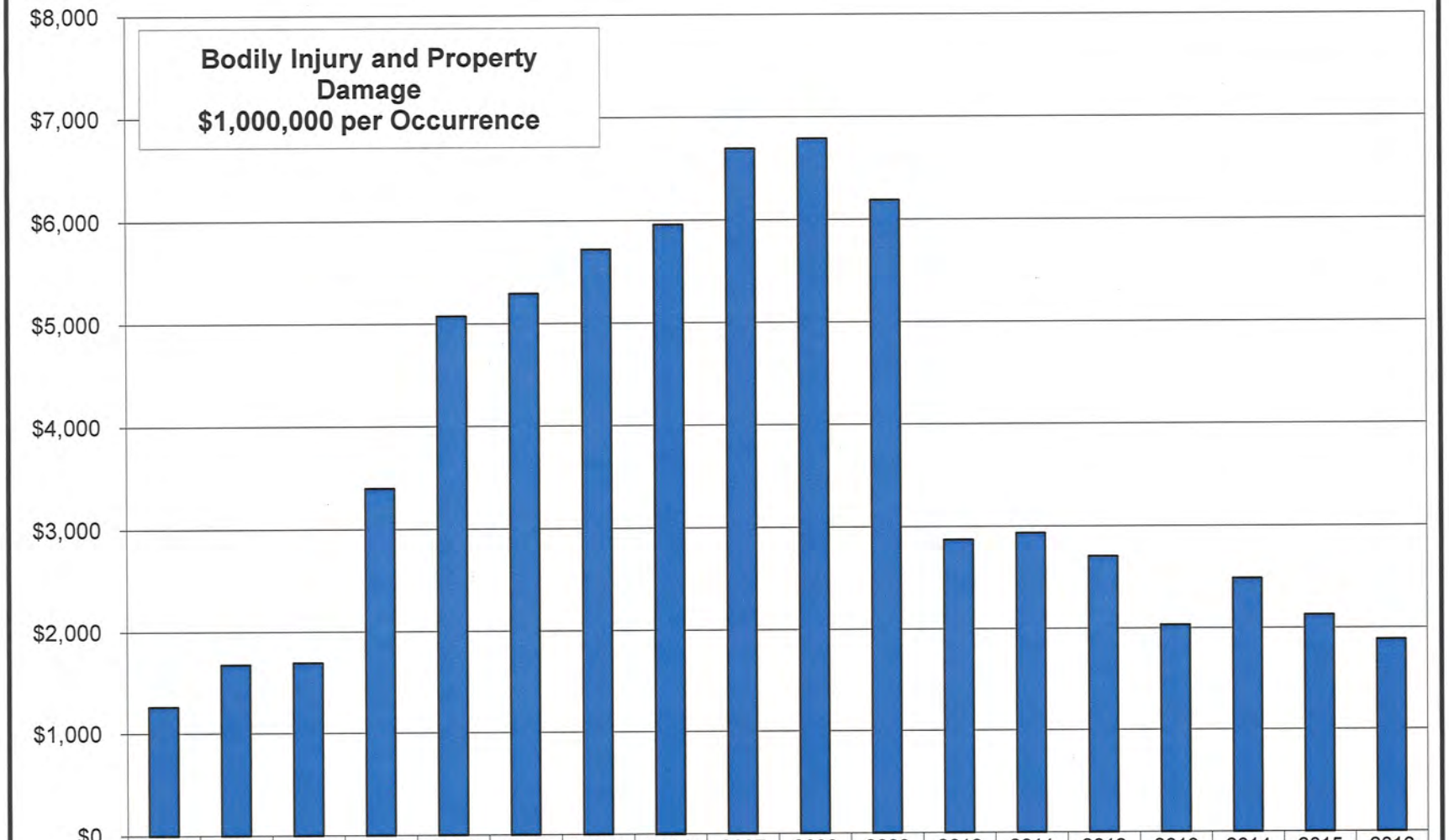
The premium cost for each of Oceana Marin's 229 dwelling units is $8 per year. CSRMA reports that the average cost of the 575 sewer overflow claims incurred over the ten year period ending in 2015 was $17,864, which equates to $78 per Oceana Marin customer absent insurance. In February 2008 a sewer main in Oceana Marin ruptured, and CSRMA reimbursed the Oceana Marin district $50,370 for clean-up costs. Since 1999, when the District initially purchased liability insurance for Oceana Marin, and including the 2016 premium, annual premium payments total $66,782.

1/4/16

t:\ac\excel\insurance\[csrma premium history.xls]data

Oceana Marin Liability Insurance Premium

Renews January 1



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Premium	$1,262	$1,675	$1,696	$3,394	$5,073	$5,294	$5,718	$5,959	$6,695	$6,790	$6,190	$2,869	$2,932	$2,704	$2,033	$2,485	$2,127	$1,887

A third candidate is running for Marin's Board of Supervisors from the sprawling West Marin-centered 4th District. Tomas Kaselionis, 40, will join Woodacre's Alex Easton-Brown and West Novato's Dominic Grossi seeking to succeed Steve Kinsey, who will retire at the end of the year.

Like rancher Grossi, Kaselionis contends that as a non-politician he's the antidote to complaints that county supervisors are out of touch with the concerns of ordinary Marinites.

His background addresses one of Marin's most compelling issues: preparation for the inevitable next disaster whether it's from wildland fire, flood or earthquake.

Kaselionis is the regional training manager for the Federal Emergency Management Agency. He's a long-serving Coast Guard reservist and a Marin Hazardous Materials Team volunteer.

The Novato resident comes from a prominent family. Both his mother-in-law, Kit Cole, and his wife, Kim Kaselionis, are well-known Marin bankers. Cole was a founder of Tamalpais Bank.

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Kaselionis just finished a four-year term as an elected member of the much-in-the-news Novato Fire District board. He marked his departure by filing a complaint with the state's Fair Political Practices Commission, contending that three of his fellow fire directors "participated in board discussions in which they could have directly or indirectly benefited."

Essentially his complaint echoed public concerns that many of Novato Fire District's past and present directors are part of the "fire family," working for or retired from related agencies. The slam is that they have vested interests in securing enhanced benefits for the admittedly well-compensated Novato firefighters. The FPPC just ruled that his complaint is a "public pay issue," more appropriately resolved by the political process.

Kaselionis indicates his passion is to create "a consumer-driven environmental revolution that's effectively neutral for the environment."

The campaign will determine how that green ethic applies in on-the-ground issues that bedevil both rural and suburban 4th District voters.

Columnist Dick Spotswood writes on local politics on Sundays and Mondays in the IJ. Email him at spotswood@comcast.net.

Marin makes water goals for December

By **Mark Prado**, *Marin Independent Journal*

POSTED: 01/08/16, 5:52 PM PST | UPDATED: 5 DAYS AGO0 COMMENTS

Even with rain falling, Marin continues to save water, meeting state-mandated goals for seven straight months.

State orders issued in May required the Marin Municipal Water District to cut use by 20 percent and the North Marin Water District by 24 percent beginning June 1. The state developed those percentages by looking at per-capita water use. The higher the water use, the more a community had to cut back.

The latest figures show that in December, Marin Municipal saved 24.3 percent compared with September 2013, the baseline year the state is using to measure conservation efforts. That was the last year California was not in drought.

The district's cumulative decrease is 21.5 percent since June, above the state conservation standard of 20 percent.

"Our customers continue to do an excellent job conserving; we are not just meeting our state target of 20 percent less use, we are exceeding it," said Libby Pischel, water district spokeswoman. "This level of conservation is particularly impressive in the winter, when people aren't irrigating, so there is less wiggle room in terms of reducing water use."

The agency has 190,000 customers between Sausalito and San Rafael.

December data for the North Marin Water District's Novato service area shows a 32 percent reduction from the same month in 2013. The North Marin Water District serves 60,000 customers in Novato and West Marin. Since the state order went into place, the district's customers have averaged a 32 percent savings.

"Novato customers have exceeded the water savings target," said Chris DeGabriele, general manager for the district.

The water saving rules were to remain in effect until February 2016. But in November Gov. Jerry Brown announced an executive order that would continue the conservation measures through October 2016 if drought conditions continue through January.

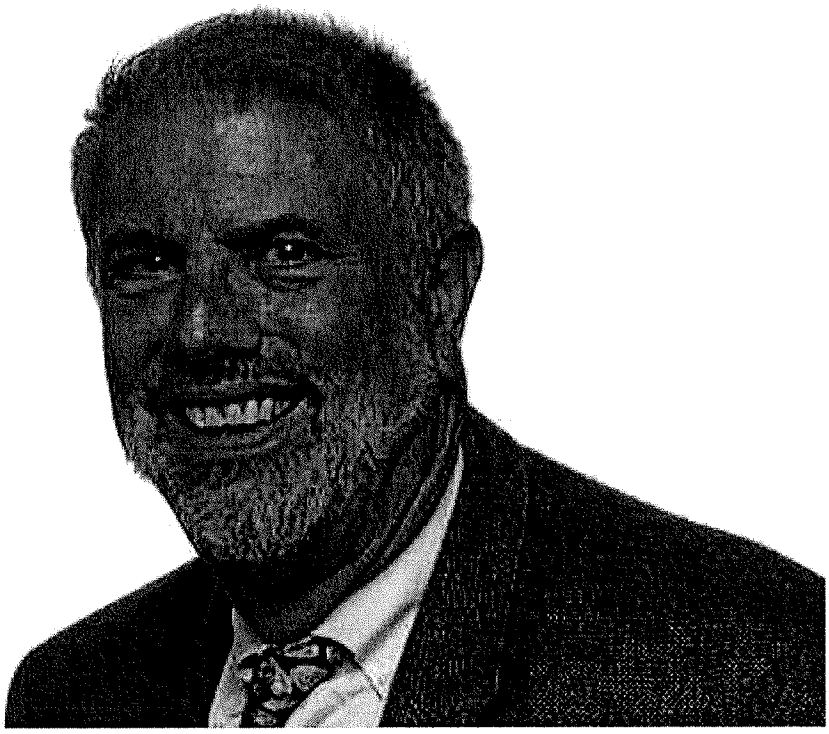
Weather forecasters say a wet El Niño winter is beginning to play out and could bring some drought relief. But if the rains stop, the mandates could continue.

Californians have reduced water use by 26.3 percent in the six months since emergency conservation regulations took effect, continuing to meet Brown's 25 percent mandate despite a decline in the statewide water-savings rate for the past two months.

"We expected the percentage drop in the cooler fall and winter months when we use less water in general, so we are still on track," said Felicia Marcus, chairwoman of the state Water Resources Control Board. "The fact

that per-person water use dropped to 75 gallons per person per day on average is proof that Californians are clearly thinking twice before turning on the tap. As welcome as recent rain and snow are, we've been in such a deep drought that we won't know until spring whether we can let up on conservation."

Dick Spotswood: Race begins to take form to succeed Kinsey



Dick Spotswood writes a twice-weekly column on local politics for the Marin Independent Journal. (IJ photo/Robert Tong)

POSTED: 01/05/16, 2:09 PM PST | 2 COMMENTS

The new year sees a second candidate taking a major step toward running for the open 4th District on Marin's Board of Supervisors now held by Steve Kinsey, who is retiring after five terms.

Dominic Grossi, 42, scion of a longtime West Marin ranching family, has now filed papers with the Secretary of State indicating his intent to run in the sprawling West Marin-centered district. This is the preliminary move before actually filing for the supervisorial post. Before he makes the final decision, Grossi is now determining if he can raise funds and gain support to mount a first-rate effort. He tells me, "So far, I'm having good success."

Grossi, a life-long Marin resident, comes from a legendary ranching family. He uniquely combines a business sense based on sustainable agriculture and a history of hands-on commitment to the environment.

The first 4th District candidate out of the blocks was Lagunitas' Alex Easton-Brown. He kicked off his candidacy last fall, even before Kinsey unexpectedly announced his retirement.

If elected, West Novato's Grossi would be the first county supervisor in more than half a century who earns

his living in farming or ranching. That might make him the ultimate non-politician, a trait many voters claim to be seeking.

Grossi's ability to represent West Marin's ag interests is undisputed. His challenge will be to demonstrate to suburbanites in Corte Madera, Larkspur, Homestead Valley and San Rafael's Canal neighborhood, whose residents compose a majority of the district's population, that he understands their needs and can address their frustrations.

As a West Novato resident, Grossi has a leg up garnering support in that often forgotten but substantial portion of the 4th District.

Other candidates seeking to succeed Kinsey are expected to emerge in coming weeks. The first-round nonpartisan balloting for all three Marin supervisorial seats up for election this year will be in June with a runoff following in November if no candidate secures a first-round majority.

•••

Another year has passed without a single execution at San Quentin, the site of the Golden State's death row. That's no surprise since the last felon executed in California's death chamber was a decade ago.

Marin has the unenviable distinction of being the only place in the state where executions are carried out. California is now on the verge of spending millions upgrading the prison's antiquated death row.

That would be a big mistake if death penalty foes gather the signatures for a November initiative to abolish executions. Such an initiative might pass this time. Polling shows that support is steadily increasing for ending capital punishment and replacing it with an iron-clad guarantee that those convicted of heinous crimes are instead imprisoned for life without the slightest chance of parole.

Since 1978, California wasted $4 billion on all aspects of the death penalty. During those 38 years only 13 condemned men have been executed. That works out to $310 million for each execution actually carried out.

The reality is that the death penalty has effectively been abolished, at least in California. Defense attorneys, their anti-capital punishment allies and the judiciary long ago devised the now successful strategy of defeating the death penalty's purpose by pursuing never-ending appeals.

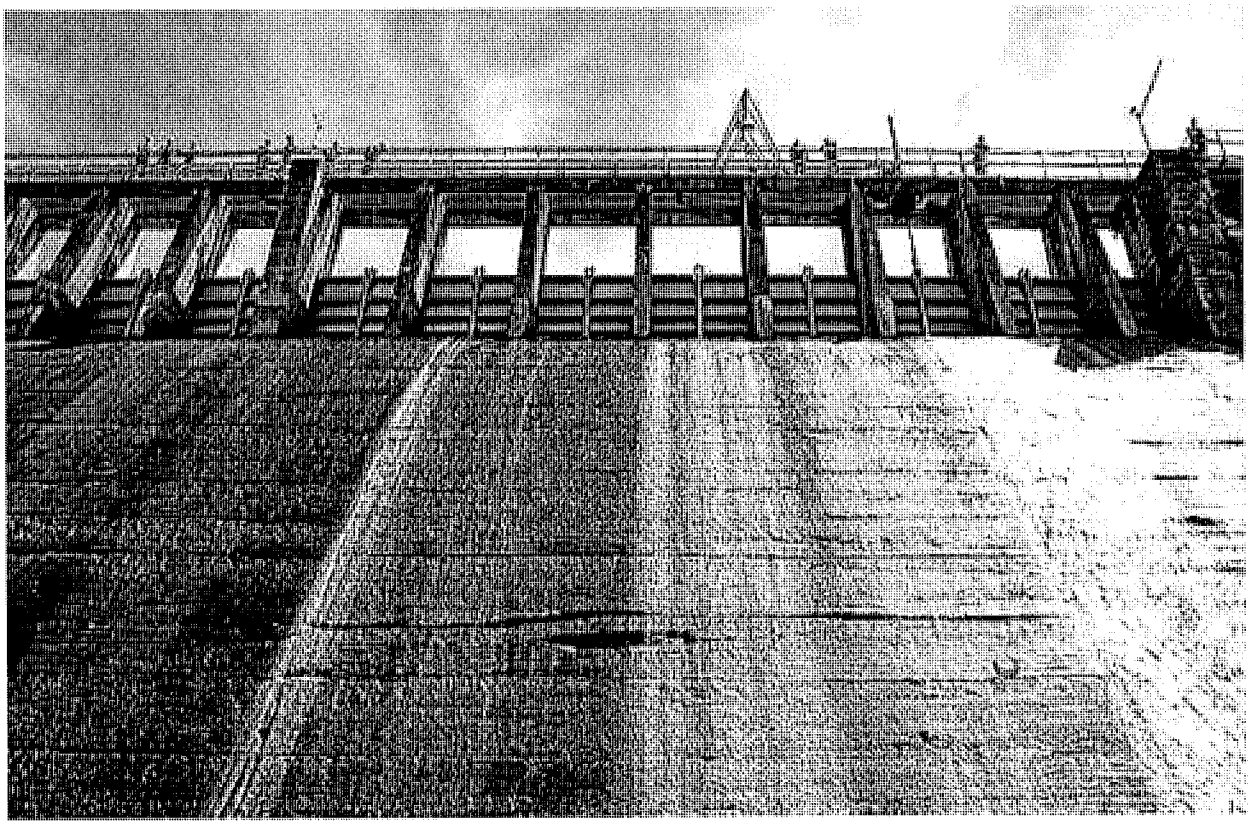
The upshot is that most death row denizens die of old age.

Advertisement

Those theoretically sentenced to die by lethal injection have far more privileges and enjoy a better living standard than rank-and-file prisoners. Better that they spend the rest of their lives in bleak cell blocks than enjoy the perks granted by law to those with death sentences that will never be carried out.

Columnist Dick Spotswood writes about local politics on Wednesdays and Sundays in the IJ. Email him at

HSU studies to examine how Eel River dams impact salmon



The Scott Dam of Pacific Gas and Electric Co.'s Potter Valley Project is set to go under review for relicensing in 2022 by the Federal Energy Regulator Commission. Justine Frederiksen — Ukiah Daily Journal

By **Will Houston**, *Eureka Times-Standard*

POSTED: 01/08/16, 9:50 PM PST | UPDATED: 2 DAYS AGO0 COMMENTS

Amid an ongoing drought, a struggling salmon migration and a narrowly avoided water storage catastrophe at the Potter Valley Project, two studies by the Humboldt State University River Institute are seeking to determine whether dam releases to the Eel River could be managed more adequately for fish.

While the Potter Valley Project's Scott Dam is set to undergo a federal relicensing process in 2022, HSU Environmental Science & Management professor and project lead Alison O'Dowd said the goal of the research is not to advocate for dam removal. Instead, she said the research seeks to determine what flows would be needed to restore dwindling salmon populations on the river and whether dam removal would provide any further benefits.

"Historically, we can see salmon get ignored," O'Dowd said. "... We're trying to have a voice for the fish."

POTTER VALLEY PROJECT

While other factors are affecting the strength of Eel River flows, the two studies limit their focus on how the Pacific Gas and Electric Co.'s Potter Valley Project affects the hydrology and habitat for migrating salmonids

such as threatened Chinook and coho salmon.

Friends of the Eel River Executive Director Scott Greacen said state and federal agencies only provide enough resources to keep the fish populations on "life support."

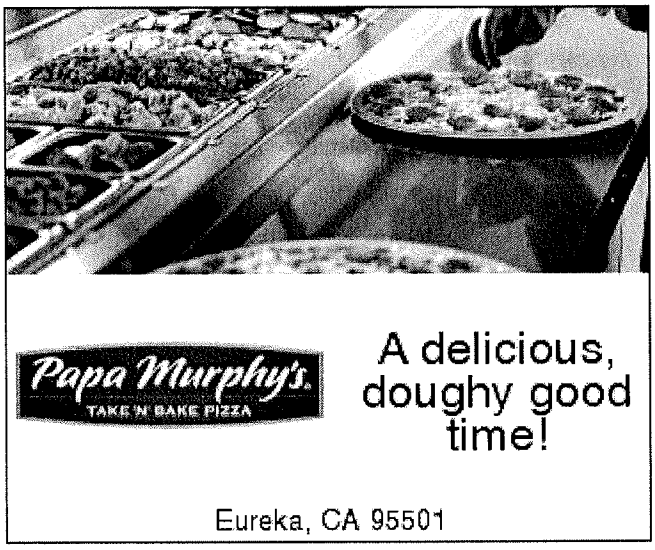
"Having better information about how streamflows in the Eel River are linked to the ecological function of the river, especially to food webs that support fisheries, is a central part of figuring out how to best restore ecological recovery for our salmon and steelhead," Greacen said.

Anti-dam organizations Friends of the Eel River and CalTrout are funding the two studies, but O'Dowd said the research has been and will remain objective.

Citing information from the National Marine Fisheries Service, an HSU news release states that an estimated 500,000 salmonids existed in the Eel River watershed before 1900.

"Today, there are fewer than 15,000 salmonids — a 97 percent drop in population that environmentalists have partially attributed to the Potter Valley Project owned by PG&E," according to an HSU news release.

PG&E senior fisheries biologist Paul Kubicek wrote in an email to the Times-Standard that several other factors have played a significant role in this decline — including logging, agriculture, marijuana cultivation, natural events and introduction of invasive species. Under the project's federally implemented operations plan, PG&E conducts annual monitoring studies to determine whether any changes should be made in the project's operations to benefit downstream fish, Kubicek said.



Advertisement

"PG&E is open to making changes in operations based on the findings of these studies," he wrote.

PG&E's Potter Valley Project was constructed in the early 1900s in the upper reaches of the 3,600-square-mile Eel River Basin near the headwaters of the Russian River in Mendocino County.

The project's main components include two dams, a diversion tunnel connecting the Eel River to the Russian River and a hydroelectric powerhouse.

The Cape Horn dam was constructed on the Eel River in 1908 to create the Van Arsdale reservoir, which worked to carry water south through the mile-long diversion tunnel to provide water and generate hydroelectric power for Potter Valley residents.

About 12 miles upriver of Cape Horn Dam is the Scott Dam, which was constructed in 1922 to form the Lake Pillsbury reservoir. Lake Pillsbury was created to supply a continuous flow of water to the project's power generators during the late spring and summer months when the Eel River flows typically begin to decrease.

While minimum environmental flow requirements were eventually established to support federally protected species of salmon on the river, the dams created new challenges for the anadromous fish that affected all

aspects their freshwater life such as migration, spawning, and juvenile development. A fish ladder was added to the Cape Horn Dam to allow fish to pass into the Van Arsdale reservoir, however no such passageway exists for Scott Dam and thus several tributaries once used for spawning were lost.

One of the HSU River Institute's studies will have graduate students use geographic information system (GIS) technology and field research to determine whether any suitable habitat exists upstream up of Scott Dam and what migrational barriers these fish could encounter. O'Dowd said this study just recently began and will take about a year to complete.

"The product is going to be a map showing where fish could get to if the dam wasn't there or if there was fish passage," O'Dowd said.

While recognizing the dam blocks fish passage, Kubicek wrote that water is released from Scott Dam into the upper Eel River during the late summer and early fall "when historic river flows were much reduced and nearly non-existent in some years."

BALANCING FLOWS

As the statewide drought entered into its fifth year in October, National Marine Fisheries Service fishery biologist Joshua Fuller in Santa Rosa said the water storage situation at the Potter Valley Project was becoming dire.

"Trying to manage that storage has been challenging obviously, with the conflicting interests of meeting the diversion demand and remedial requirements for environmental flows," Fuller said.

Near the start of the December, Lake Pillsbury's volume was nearing 10,000 acre-feet — about 13 percent of its 75,000 acre-feet capacity. If the reservoir reached below this level, Fuller said there was a high likelihood that the banks of the reservoir could begin eroding with the resulting sediment deposition blocking the Scott Dam's needle valve.

"If the needle valve got clogged, we could be in a situation where no water was being released to the Eel or the Russian River," Fuller said. "You could have complete infrastructure failure."

Anticipating this earlier in the year, a drought working group made up of government agencies, tribes and environmental organizations was formed to address the immediate storage issues. PG&E's request to vary from its normal flow schedule by releasing more water into the main stem Eel River and diverting less to the Russian River was eventually granted by the Federal Energy Regulatory Commission.

"We made some quick adjustments to the diversion and some of the environmental flows in October with the idea of banking enough water in (Lake) Pillsbury that we could release some water when Chinook really needed it," Fuller said.

Around the start of December, the group utilized this stored water in the form of pulse flows and timed the release with recent rainfall to signal Chinook salmon to migrate farther upriver to their spawning grounds. As a result, more than 100 Chinook salmon have made it to the Van Arsdale reservoir, which acts as a good spawning area. Fuller said that this number is lower than average, but he did not believe that any salmon would make it that far this year.

"The verdict is still out," he said.

On Dec. 22, Fuller said the drought working group agreed to shifting back to the original flow schedule due to the recent rains refilling Lake Pillsbury. As of Thursday, Fuller said Lake Pillsbury had filled to 54,500 acre-feet.

MANAGING SUPPLIES

A federal biological opinion from 2002 allows resource agencies like the National Marine Fisheries Service and the state Department of Fish and Wildlife to release up to 2,500 acre-feet of Lake Pillsbury water each water year at their discretion.

Before the biological opinion, Kubicek said 17 block water releases were made between 1985 and 1996, with two having occurred since 2004 to help migrating salmon and juvenile steelhead habitat.

Greacen said his organization has continually complained about this lack of use in recent years, especially considering the near-historic low levels on the Eel River these past few years.

"It just sat there in theory every year," Greacen said.

This block water has also been used to promote juvenile salmon that had grown comfortable in the Van Arsdale reservoir's cool waters to begin moving downstream to the ocean.

O'Dowd said the project's diversion tunnel significantly impacts the flows on the river during the late spring and early summer as juvenile Chinook salmon begin making their way back to the ocean and as early arriving adults begin travelling upriver to their spawning grounds.

"It's diverting more than half of the water of the main stem flow at drier times of the year," O'Dowd said of the project.

As to how the river flowed before the dams were constructed is what O'Dowd and fellow HSU Environmental Science & Management Department professor William Trush have been working to figure out over the last year-and-a-half.

Using rainfall records, historic flow recordings and a fair bit of math, the professors are aiming to create a model of how an undammed Eel River would flow under different conditions.

O'Dowd hopes this model can be used to better inform agencies what flows would be needed to sustain healthy salmon populations and activities.

"We're trying to put more science behind that management," she said.

Since 2006, Fuller said the National Marine Fisheries Service and other Potter Valley Project resource agencies have been using the flows laid out in the biological opinion of the Federal Energy Regulatory Commission (FERC).

"I think as the science progresses and our knowledge of the fisheries improves, I think it's always a good idea to reevaluate certain situations where we can improve things," Fuller said. "That's not to say the biological opinion's flow schedule is not adequate."

The Scott Dam is set be reviewed for relicensing by FERC in 2022. Greacen said his organization's purpose is to see all of the dams removed.

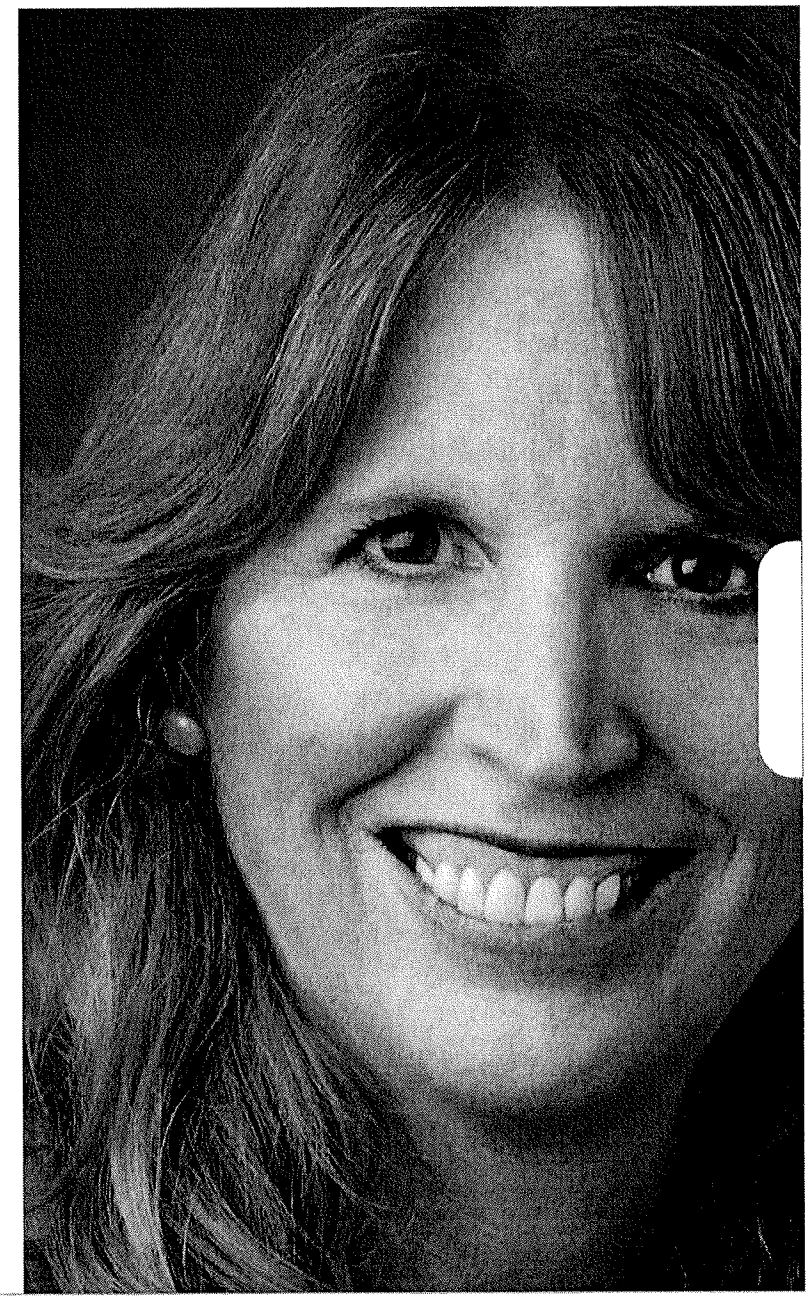
"Are we actually going to be rational about the costs and consequences of our irrigation practices and our energy production?" Greacen asked. "... We are up against the built-in assumption that irrigation is necessary; that Potter Valley can only prosper with water taken from the upper Eel; that hydropower is also more necessary than the other alternatives."

For Kubicek, the project provides several benefits — including the generation of "clean electricity," fisheries protection and water for agriculture.

"At the same time, we believe in being responsible stewards of the environment," Kubicek wrote, "which is why we work closely with local agencies and stakeholders to implement numerous actions to protect and promote the production of salmon and steelhead in the watershed."

Will Houston can be reached at 707-441-0504.

Former state legislator Noreen Evans enters race for Sonoma County supervisor



(2 of 5) Noreen Evans (2013)

ANGELA HART
THE PRESS DEMOCRAT | January 12, 2016, 6:07PM
Updated 1 hour ago.

Former state Sen. Noreen Evans has entered the race for 5th District Sonoma County supervisor, a highly anticipated move by a political heavyweight vying for the west county seat held by Efren Carrillo.

Evans, 60, who last month moved into the district, to Sebastopol — and out of her home in eastern Santa Rosa — is the second candidate to enter the race, with Carrillo still declining to say publicly whether or not he plans to run.

Evans' move comes after she chose in early 2014 not to seek re-election to the state Senate, where she represented the North Coast for four years. Previously, she served six years in the Assembly before being termed out.

In leaving the Legislature, Evans, an attorney, signaled her wish to resume private law practice. She returned home last year after a tenure in Sacramento highlighted by her legislation staking out mortgage rights for homeowners, advocacy for parks and coastal protection and her ascent into leadership roles in the Senate.

But her time in the Legislature also was marked by public comments that suggested she was disenchanted with elected office, and early into her Senate term she applied for an appointment as a judge on the California Court of Appeal.

Evans, a Democrat, who previously served on the Santa Rosa City Council, said her passion for local politics has driven her bid for county office.

"Sonoma County needs some strong and principled leadership … I feel like I did some pretty important things in the state Legislature, but I got homesick and decided I'd rather be home running for supervisor," Evans said. "Local government allows me to be involved with people and engage with them on a daily basis on the issues they care about and have a direct impact. That's what I really love."

Lynda Hopkins, 32, a Forestville resident and independent farmer, announced her bid for Carrillo's seat nearly two months ago.

Carrillo, 34, has faced waning political support in the aftermath of two alcohol-fueled arrests since 2012. Last week, he was unanimously elected by his board colleagues as chairman, but he continues to be silent on whether he will to run for re-election.

Evans' decision to enter the race, meanwhile, already has helped shape the June 2016 primary, just five months away. Three people who previously were considering a run said Tuesday they were no longer doing so. No longer weighing a run are Dennis Rosatti, executive director of Sonoma County Conservation Action, the county's largest environmental organization, and Rue Furch, a longtime county planning commissioner who lost to Carrillo in 2008. Both Rosatti and Furch share political allies with Evans, who enjoys strong support among environmental groups.

Tawny Tesconi, the former Sonoma County Fair manager and recently retired General Services director, also said Tuesday that she would not seek the west county

supervisor seat.

"I've decided my passion is with the fair industry," Tesconi said.

One potential rival for Evans is Eric Koenigshofer, an Occidental attorney who represents the Ratto Group, the county's dominant garbage hauler. Koenigshofer, 65, a close Carrillo adviser who represented the 5th District on the Board of Supervisors 35 years ago, said he is serious about running for the job if Carrillo doesn't.

"If Efren is not in, I'm running," said Koenigshofer, criticizing Evans' recent move to Sebastopol, a relocation that allows her to run for the 5th District seat. "I believe the person who represents the 5th, with all these little towns and villages and communities, should be deeply rooted in the district so they have the ability to capture the pulse of these places. ...People who know the area are better suited to provide the kind of attention and representation that is most beneficial to these rural parts of the county."

The filing deadline for candidates to formally declare is in March.

Two other supervisors up for re-election, Shirlee Zane and Susan Gorin, already have launched their campaigns and begun raising money.

Evans was first elected to the Santa Rosa City Council in 1996, and in 2000 she ran unsuccessfully for county supervisor against then-incumbent Tim Smith. She was

elected to the state Assembly in 2004 and served until 2010, when she won election to the state Senate.

She stirred a minor uproar among critics in 2011 when, in protest of losing her taxpayer-funded car, she suggested that she would resort to hot air balloons, llamas and other unconventional modes of travel to visit residents of her sprawling North Coast district, stretching from Sonoma County to the Oregon border. Evans said at the time that she was trying to be funny and poke fun at the decision made by a state commission on state-funded cars for legislators. Evans said the move would cost her about $1,000 a month but would ultimately hurt voters.

In early 2014, two months after being stripped of her leadership post on the influential Senate Judiciary Committee in a dispute with Senate leader Darrell Steinberg, Evans signaled she would not run for re-election. In May 2014, however, she was appointed chairwoman of the Senate's Banking and Financial Institutions Committee, giving her a powerful platform to push a consumer advocacy agenda in her final year in office.

On Tuesday, Evans did not address the demands of her previous office and said only that she wanted to return to local politics.

"There is a real big difference in working in the capital, where you're working on broader issues, and working in local government, where you can have a direct impact on the lives of people," she said. "That's why I'm excited to be running for supervisor.

I'm working on getting as much support as I can, I'm looking for endorsements and volunteers, and I'm ready to start raising money and knocking on doors."

Carrillo and others have questioned Evans' move into the district, saying she has simply been "shopping for political office" since she left the Legislature last January.

"With nearly 100,000 people who live in the 5th District, I believe there are plenty of other viable candidates who could serve," Carrillo said Tuesday. "I believe that voters, especially those in the smaller hamlets and villages of west county and those in Roseland, are going to care where their supervisor is from. ... To think that she knows the district already because she served in the state Senate, I think is an entitled position."

Evans two years ago was the highest-ranking elected official to call on Carrillo to resign in the wake of his acquittal on a charge of attempting to peek into a female neighbor's apartment. Carrillo was arrested in July 2013 in the pre-dawn hours outside the woman's home wearing only his socks and underwear.

Evans on Tuesday touted her 20-year voting record at the state and local level. She championed issues she contends she can be strong on, including creation of affordable housing, addressing homelessness, protecting open space and upkeep of roads and public infrastructure.

"I've lived here for 34 years, I raised two kids here, and I've got the experience on the issues that I have worked on for many years," she said.

David McCuan, a Sonoma State University political scientist, said the 5th District race could become the most expensive in the county's history. He cited Evans' name recognition, a potential high-stakes political matchup between Evans and Koenigshofer and the possible influx of campaign money from across the state.

"Noreen Evans elevates the race," McCuan said. "It could beat the (James Gore and Deb Fudge) spending record, and it steers the direction of the board into the future."

McCuan also argued that Evans' political ambitions could be buoyed by the influence county supervisors have on local politics, as well as other perks of the job.

Base pay for county supervisors is nearly $142,000 per year — more than $50,000 higher than the starting salary in the state Legislature, where office holders, unlike county supervisors, do not receive pensions.

Evans, who announced her supervisorial bid on the KSRO radio show "The Drive with Steve Jaxon" Tuesday night, said she's re-hired her longtime San Francisco-based campaign manager, John Whitehurst. She currently is working as an attorney with the Santa Rosa-based firm of O'Brien, Watters & Davis. She said she plans to continue legal work throughout her campaign.

Some groups have already thrown their support behind Evans.

"We're very pleased Noreen is entering the race," said Jack Buckhorn, president of the North Bay Labor Council. "We feel that she will be strong on issues labor is very concerned about."

You can reach Staff Writer Angela Hart at 526-8503 orangela.hart@pressdemocrat.com. On Twitter @ahartreports.

Marin IJ launches new public affairs program with focus on open space trails conflict

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Try watching this video on www.youtube.com, or enable JavaScript if it is disabled in your browser.

By Marin Independent Journal

POSTED: 01/12/16, 2:18 PM PST | UPDATED: 21 HRS AGO30 COMMENTS

We invite you to view, on your computer or television, the first installment of "IJ Forums," a series of half-hour conversations featuring our host, IJ political columnist Dick Spotswood, and key leaders driving debate on a variety of important issues across Marin County.

The sessions are recorded for

How to watch 'ij forums'

•Visit marinij.com/topic/ij-forums

• View on Comcast Channel 26 and AT&T U-verse Channel 99:

5:30 p.m. Saturday, Jan. 16

7:30 p.m. Monday, Jan. 25

5:30 p.m. Saturday, Jan. 30

broadcast by our partner, theCommunity Media Center of Marin, and appear both onmarinij.com and on the media center's television channels.

7:30 p.m. Monday, Feb. 8

First up on "IJ Forums": the hot-button topic of whether to open more trails across Marin to mountain bikers. Our guests are Linda Novy ofFootPeople, which advocates on behalf of hikers; and Vernon Huffman, ofAccess4Bikes, which supports opening more trails to mountain bikers.

"IJ Forums" is an effort to add depth and context to key public policy issues, and to introduce the public to some of the local players who are helping shape decision-making.

The new venture is part of the IJ's continuing effort to offer a variety of multi-media programming to supplement news, opinion, sports and entertainment in our newspaper and on our website.

The format: Spotswood, an attorney who writes a twice-weekly IJ column on public affairs, poses questions to two guests representing different perspectives in an effort to probe what distinguishes them, and where they might find common ground.

In the session on trails and mountain bikes, Novy and Huffman traded arguments to back their positions in a lively give-and-take.

"Certainly the FootPeople aren't saying: 'Don't have bikes out there,'" Novy said. "We simply want appropriate trail use; we want protection of our natural resources; and we want compliance (with trail regulations). And we think compliance should come before additional opportunities (for biking trails) are offered — not the other way around."

Said Huffman: "It's important to recognize that we are a growing user group. We are the second-largest user of our open spaces, but we have been underserved by the policies and the leadership of Marin. So given that we're not going away, the best thing to do would be to be problem solvers, not obstructionists, and come together and figure out ways in which we can share the limited open spaces that are out there."

To watch the first installment, visit marinij.com/topic/ij-forums. The program also will be shown on television via Comcast Channel 26 and AT&T U-verse Channel 99 on the following schedule: 5:30 p.m. Jan. 16; 7:30 p.m. Jan. 25; 5:30 p.m. Jan. 30; and 7:30 p.m. Feb. 8.

The series of topics will continue monthly, and will be announced in

stories and advertisements in the IJ. Stay tuned.

Petition to label water additives

By Beau Evans
01/07/2016

A nonprofit group is gathering signatures for a ballot measure to suspend the Marin Municipal Water District's program of dosing drinking water with chemical additives that increase fluoride until the district identifies those additives and their health risks. The measure also would require the district to submit a written statement either on the district's website or on monthly customer bills that would verify whether the chemicals are safe for ingestion.

Sponsored by Clean Water Sonoma Marin, the petition needs 14,000 signatures by April 30 to qualify for the November 2016 ballot. The group fears that three acid-based fluoride compounds—hydrofluorosilicic acid, sodium fluorosilicate and sodium fluoride—that the district uses to increase its water's naturally occurring fluoride levels may be harmful to public health.

Of the five largest public water utilities operating in West Marin, M.M.W.D. is the only one that fluoridates its water supply. North Marin Water District, the Inverness Public Utility District, the Bolinas Community Public Utility District and the Stinson Beach County Water District do not fluoridate their water, though slight naturally occurring levels are present at about 0.1 milligrams per liter in each supply.

Fluoride is viewed by groups such as the American Dental Association as a way to prevent tooth decay; it has been added to M.M.W.D.'s drinking water since the 1970s, when voters approved measures supporting fluoridation. But critics, like Clean Water Sonoma Marin, cite recent studies, including one by a former Harvard Medical School researcher, that show a potential link between fluoridated water and hypothyroid conditions, bone cancer and early childhood brain development.

"The worst part of all this is that it isn't even a pharmaceutical-grade product that they're putting in the water," said Clean Water's director, Dawna Gallagher-Stroeh. "They're putting in an industrial-grade byproduct of the fertilizer industry."

The district's environmental and engineering services manager, Michael Ban, said that even if the petition lands on the ballot, a 1995 state law that requires fluoridation for districts with more than 10,000 customers may make the effort moot. M.M.W.D. serves 186,000 customers.

"We can't not do it," Mr. Ban said. "We cannot unilaterally stop fluoridating the water supply."

Mr. Ban describes the amount of acid-based fluoride compounds added to the water as about "one drop in every 18
gallons."

M.M.W.D. customers narrowly supported water fluoridation through two ballot measures—in 1972 and in 1978—that passed by slightly more than 50 percent. Neither of those measures can be overturned without another ballot measure. And according to the district, even then the state Attorney General's Office could bring a lawsuit against the district if they were overturned.

Ms. Gallagher-Stroeh, however, pointed to a loophole in a state health code that would allow M.M.W.D. to be exempted from the state's water fluoridation requirement if ratepayers are funding the fluoride program's service and maintenance costs. She claims that fluoridation is paid for out of the district's general fund, which includes ratepayer
contributions.

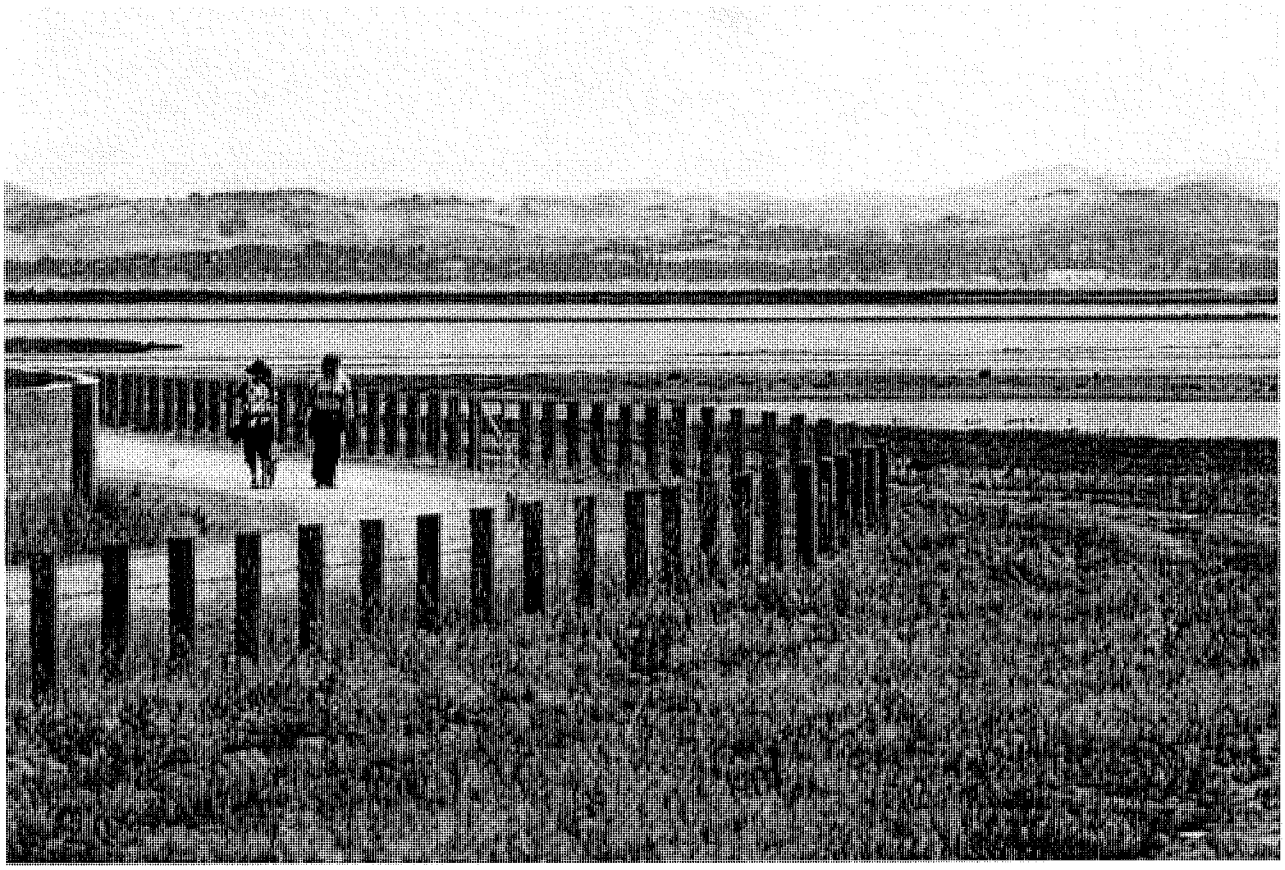
"They think they have to adhere to the state mandate," Ms. Gallagher-Stroeh said. "If that were true, then they

would have to stop [using] ratepayer money for fluoridation."

But Mr. Ban, in a 2013 memo to the district, said that the approximately $140,000 needed to fluoridate the water comes from sources other than ratepayers, such as property leases. Nonetheless, he concedes that the state law on fluoridation is fuzzy and, should district voters overturn the old ballot measures, that the end result is presently unknowable.

"I think we'd still have to figure out what the outcome would be," Mr. Ban said. "It's not entirely clear."

$12 parcel tax proposed for Marin, Bay Area counties for bay restoration



The Bay Trail at Hamilton Field in Novato. A proposed parcel tax would raise money to build levees and restore thousands of acres of wetlands and tidal marshes as a buffer to storm surges and floods in the Bay Area. Frankie Frost — Marin Independent Journal

By Paul Rogers, Bay Area News Group

POSTED: 01/13/16, 6:53 PM PST | UPDATED: 7 HRS AGO 7 COMMENTS

In a milestone for San Francisco Bay restoration that also raises questions about who should pay to protect property from rising seas caused by climate change, a low-profile government agency voted Wednesday to place a $12 annual parcel tax on the June 7 ballot in Marin and the rest of the Bay Area counties.

The measure, whose campaign is being bankrolled by Silicon Valley business leaders and Bay Area environmental groups, is believed to be the first local tax ever placed before voters in all nine Bay Area counties.

If approved by two-thirds of voters, the tax would raise $500 million over the next 20 years to build levees and restore thousands of acres of wetlands and tidal marshes as a buffer to storm surges and floods in every Bay Area county against the backdrop of anticipated sea level rise.

"People say wetlands have been restored in the North Bay, but there is more to be done," said Keith Caldwell,

the North Bay representative on the San Francisco Bay Restoration Authority, a seven-member board created in 2008 by state lawmakers.

Studies done by the business group the Bay Area Council and other organizations show that 270,000 residents, 1,780 miles of road and highways, 89 schools and health care facilities near the bay's shoreline are at risk of catastrophic flooding from a 100-year flood and sea level rise.

Other areas that computer models indicate could be flooded include communities along the Marin waterfront. San Francisco Bay Conservation and Development Commission maps show the bay pushing almost all the way to Highway 101 in parts of Novato, as well as water covering low-lying areas of Mill Valley, Sausalito and Tiburon, among other areas.

Also at risk are the Oakland and San Francisco airports, Highway 101 through the Peninsula, and the headquarters of at least 20 major technology companies in San Mateo and Santa Clara counties, including Google, Oracle, Facebook, Yahoo and Cisco.

POLL FINDS SUPPORT

A telephone poll of 1,505 people commissioned in December by the Restoration Authority found that 65 percent of likely voters in the Bay Area support the tax, with wide support in Marin.

The number grew to 70 percent when arguments in favor were explained. But support varied widely. While 76 percent of Marin County voters, 71 percent of San Franciscans, 70 percent of Alameda County residents and 65 percent of Santa Clara County residents backed the idea, only 44 percent did in Napa County, 55 percent in Solano County, 61 percent in Contra Costa County, 62 percent in San Mateo County and 63 percent in Sonoma County.

Because the two-thirds requirement applies to the entire region, however, a large majority in one area could offset a lower margin in a different county.

The Silicon Valley Leadership Group, which represents 390 large technology companies and other employers, along with Save the Bay and the Bay Area Council already has raised $700,000 toward a campaign and plans to raise up to $5 million. Influential leaders such as Robert Fisher of the Gap and John Doerr, a Silicon Valley venture capitalist, already have donated to the campaign.

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QUESTIONS REMAIN

The unique tax raises complex questions, however.

Since the $12-per-parcel tax will apply to all property owners in the nine counties, will people who live far away from the bay, such as residents of the Ross Valley, Lucas Valley, Lagunitas or Nicasio be willing to vote yes? Will homeowners be willing to open their wallets to fund a measure that not only protects wildlife, but also protects some of the richest companies on Earth?

"You have big companies like Apple that will only pay $12 per parcel," said Jon Coupal, president of the Howard Jarvis Taxpayers Association. "I respectfully suggest that Apple can afford the $12.

"You have large businesses trying to spread the burden to other taxpayers. If this were structured as a benefit assessment district, the properties closer to the bay would have to pay more."

WETLANDS WORK

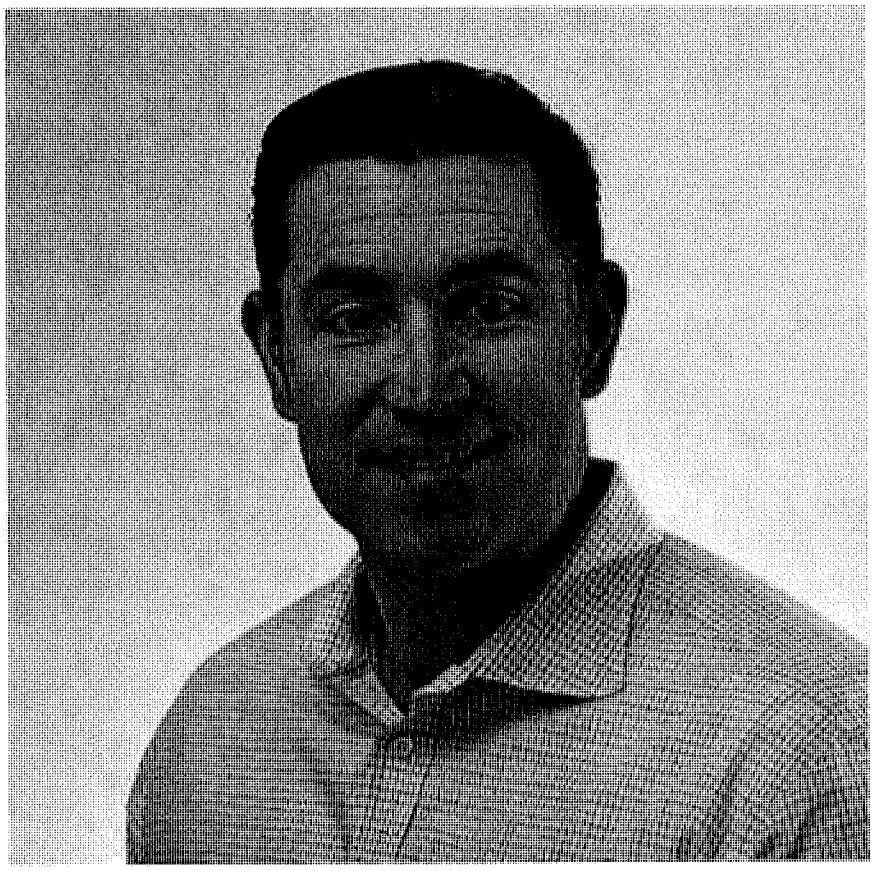
Environmentalists say the measure is critical in helping fulfill long-term restoration plans around the bay. A study in October by more than 100 scientists, coordinated by the Coastal Conservancy and other organizations, found that 54,000 acres of wetlands — an area twice the size of the city of San Francisco — need to be restored around the bay in the next 15 years to provide protection from surging storms. The alternative is concrete sea walls, which can cost more and would turn the bay into a giant bathtub over time, with far fewer birds, fish and other wildlife, the report concluded.

Driven by melting ice and expanding warming water, the bay and the Pacific Ocean off California will rise up to 1 foot in the next 20 years, 2 feet by 2050 and up to 5 feet by 2100, according to a 2012 study by the National Academy of Sciences.

"This is the most important thing we can do for the bay," said David Lewis, executive director of Oakland-based Save the Bay. "There's an urgency to restore tidal marshes, for ecological benefits and flood control benefits. The sooner we start the sooner they can provide benefits. But money has been the missing ingredient for a long time."

IJ reporter Mark Prado contributed to this report.

Federal emergency services official seeks Kinsey's supervisorial seat



Tomas Kaselionis is running for Steve Kinsey's Fourth District seat on the Board of Supervisors. Robert Tong — Marin Independent Journal

By **Nels Johnson**, *Marin Independent Journal*

POSTED: 01/13/16, 4:26 PM PST | UPDATED: 9 HRS AGO 3 COMMENTS

Tomas Kaselionis of Novato, a federal emergency management training official and Coast Guard reservist, is running for Steve Kinsey's seat on the Board of Supervisors.

"I've honed a skill set over a long period of time in crisis and disaster management," the 40-year-old Kaselionis said. "Those skills can help me deal with any problem that comes across the desk of a county supervisor."

Kinsey isn't seeking re-election to a term that begins in 2017 after 20 years on the county board representing the sprawling Fourth District. The district covers West Marin and Corte Madera as well as parts of Novato, Larkspur and San Rafael. Filing for the seat opens Feb. 15.

Kaselionis stepped down last year after a four-year stint on the Novato Fire District board after lodging a complaint against a fire board colleague and two ex-colleagues, all former firefighters he said had conflicts of interest dealing with labor negotiation and pay and benefit issues. The state Fair Political Practices

Commission recently said the matter is a "public pay issue" more appropriately resolved by the political process.

Kaselionis promises a reasoned, thoughtful administration that listens to all perspectives before coming to a logical, fair resolution. "You're going to present me a problem, and I'll figure out the risk reward ratio and come up with a solution," he said. "I'll be asking hard questions, asking for studied proof, listening to more than one perspective," he added. "I cannot accept one-sided dealings." The key, he said, is finding "the solution that minimizes impact."

The big issue, he said, "is trying to get around in Marin" and involves easing traffic and improving transit. "Where is the money?" he wondered, saying Marin hasn't received a fair share of regional transportation funding needed for roadway improvements.

What's more, local communities cannot allow huge "WinCup" style development that disrupts neighborhoods and contributes to the jam. "I cannot understand how that project went forward" in Corte Madera, he said. Instead, he said, officials must embrace "environmentally neutral" development.

As for housing development, he is an advocate of general plans. "Communities spent a lot of time developing those plans and we need to follow them," he said. "Let's not make exceptions to plans already in place."

At the same time the county works to ease traffic, it must encourage access to public lands and accommodate visitors including cyclists, he said.

Kaselionis, a surfer and mountain biker, said few have a greater love for Marin's coast and its network of open space trails. "I don't think it's fair to allow those trails to be available only for horses," he said. "We can't give advantage to one population over another."

Kaselionis, who has launched a website and Facebook campaign, believes "Marin should lead on consumer-driven environmentalism" and become a "creative market place" that attracts innovative businesses. "Where are the cycle electric generators ... the gyms that operate on human power ... the social media carpooling apps?"

He's also big on helping veterans, pledging to "do all I can" to take care of those who return after service in the armed forces. He said that with a background in emergency services that has taken him across the nation to areas devastated by flood, hurricane, tornado and oil spill, he's in an ideal position to lead on issues involving climate change and emergency preparedness.

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Kaselionis, proud of his Lithuanian heritage, is the son of a computer programmer. He graduated from Foothill High School in Orange County, studied administration of justice at Cuesta College in San Luis Obispo, and managed a series of beach restaurants before working for six years for the Transportation Security Administration managing security at San Francisco International Airport. In 2008, he signed on at the Federal

Emergency Management Administration to become a regional training manager.

He joined the Coast Guard reserve in 2001, working with the Pacific Strike Team at Hamilton Field, then spent 10 years as a reservist on hazardous materials response. His biggest mission involved a two-month stint at the Gulf oil spill in 2010.

He lives in Wild Horse Valley with his wife, Kim, who served as CEO of the old Circle Bank. Her mother, Kit Cole, founded Tamalpais Bank.