Posting Date: 01-29-2021

NOTICE OF REGULAR BI-MONTHLY MEETING
BOARD OF DIRECTORS

MEETING DATE: 02-02-2021

TIME: 7:30 p.m.

LOCATION: **This meeting will be held virtually, pursuant to the Governor's Executive Order N-29-20.**

To participate online, go to https://zoom.us/j/99031518800. You can also participate by phone by calling 1-669-900-6833and entering the webinar ID#: 990 3151 8800.

PARTICIPATION DURING MEETINGS**:** During the public comment periods, the public may comment by clicking the "raise hand" button on the bottom of the Zoom screen; if you are joining by phone and would like to comment, press *9 and we will call on you as appropriate.

EMAILED PUBLIC COMMENTS: You may submit your comments in advance of the meeting by emailing them to BoardComment@MarinWater.org. All emailed comments received by 3 p.m. on the day of the meeting will be provided to the Board of Directors prior to the meeting. Those emailed comments on approval items received by 3 p.m. will also be summarized by the board secretary at the board meeting. All emails will be posted on our website. (Please do not include personal information in your comment that you do not want published on our website such as phone numbers and home addresses.)

AGENDA ITEMS	RECOMMENDATIONS
Call to Order and Roll Call	
Adopt Agenda	*Approve*

Public Comment

Members of the public may comment on any items not listed on the agenda during this time. Comments will be limited to three (3) minutes per speaker, and time limits may be reduced by the board president to accommodate the number of speakers and ensure that the meeting is conducted in an efficient manner.

Directors' and General Manager's Announcements	

AGENDA ITEMS	RECOMMENDATIONS
Consent Calendar All matters listed on the consent calendar are considered to be routine and will be enacted by a single action of the Board, unless specific items are removed from the consent calendar by the Board during adoption of the agenda for separate discussion and action.	
1. Minutes of the Special Board of Directors' Meeting of January 13, 2021, and Regular Bi-Monthly Board of Director's Meeting of January 19, 2021	*Approve*
2. Purchase of Fourteen (14) Portable Emergency Generators	*Approve*
3. Purchase of Agilent Technologies ICP-MS	*Approve*
4. Award of Contract No. 1916, Kent Lake Aerator Vent Lines Replacement Project, in the amount of $59,681.25, to Associated Underwater Services, Inc., to replace the Kent Lake Aerator vent and air lines, and install a new aerator lifting rope	*Approve*
5. Coastal Conservancy Grant for Forestry Restoration	*Approve*
6. Continuation of Emergency Contracting Provisions for Replacement of the Porteous Tunnel Pipeline	*Approve*
Regular Calendar	
7. Water Supply Update	*Information*
8. Rental of Temporary Portable Generators for Soulajule Pump Station	*Approve*
9. 2020 Urban Water Management Plan (UWMP) Demand Projections	*Information*
10. Future Meeting Schedule and Agenda Items	*Information*
Adjournment	

ADA NOTICE AND HEARING IMPAIRED PROVISIONS:

In accordance with the Americans with Disabilities Act (ADA) and California Law, it is Marin Water's policy to offer its public programs, services, and meetings in a manner that is readily accessible to everyone, including those with disabilities. If you are disabled and require a copy of a public hearing notice, an agenda, and/or agenda packet in an appropriate alternative format, or if you require other accommodations, please contact Board Secretary Terrie Gillen at 415.945.1448, at least two days in advance of the meeting. Advance notification will enable the Marin Water to make reasonable arrangements to ensure accessibility.

INFORMATION PACKETS ARE AVAILABLE FOR REVIEW AT THE CIVIC CENTER LIBRARY, CORTE MADERA LIBRARY, FAIRFAX LIBRARY, MILL VALLEY LIBRARY, MARIN WATER OFFICE, AND ON THE MARIN WATER WEBSITE (MARINWATER.ORG)

FUTURE BOARD MEETINGS:

- Tuesday, February 16, 2021
  Regular Bi-Monthly Board of Directors' Meeting
  7:30 p.m.

- Wednesday, February 17, 2021
  Communications & Water Efficiency Committee/Board of Directors (Communications & Water Efficiency) Meeting
  9:30 a.m.

- Friday, February 19, 2021
  Operations Committee/Board of Directors (Operations) Meeting
  9:30 a.m.

- Thursday, February 25, 2021
  Finance & Administration Committee/Board of Directors (Finance & Administration) Meeting
  9:30 a.m.

Board Secretary

Item Number: 01
Meeting Date: 02-02-2021
Meeting: Board of Directors

Approval Item

TITLE
Minutes of the Board of Directors' Special Meeting of January 13, 2021 and Regular Meeting of January 19, 2021

RECOMMENDATION
Approve the adoption of the minutes.

SUMMARY
On January 13, 2021, the Board of Directors held a special meeting, the 10-Year Financial Plan Workshop 1B, at 9 a.m. Then on January 19, 2021, the board held its regular bi-monthly meeting at 6 p.m. The minutes of both meetings are attached.

DISCUSSION
None

FISCAL IMPACT
None

ATTACHMENT(S)
1. Minutes of the Board of Directors' Special Meeting of January 13, 2021 (9:00 a.m.)
2. Minutes of the Board of Directors' Regular Bi-Monthly Meeting of January 19, 2021 (6:00 p.m.)

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Communications & Public Affairs Department	Terrie Gillen **Terrie Gillen** **Board Secretary**	Ben Horenstein **Ben Horenstein** **General Manager**

Item Number: 01
Attachment: 1

MARIN MUNICIPAL WATER DISTRICT
BOARD OF DIRECTORS

SPECIAL MEETING MINUTES

Wednesday, January 13, 2021

Via teleconference
(In accordance with Governor Gavin Newsom's Executive Order N-29-20)

DIRECTORS PRESENT: Larry Bragman, John C. Gibson, Cynthia Koehler, and Monty Schmitt

DIRECTORS ABSENT: Larry Russell

CALL TO ORDER AND ROLL CALL
Board President Koehler called the meeting to order at 9:03 a.m.

ADOPT AGENDA
There was no public comment received under this agenda item.

On motion made by Director Gibson and seconded by Director Bragman, the board adopted the agenda by the following roll call vote:

Ayes: Directors Bragman, Gibson, Schmitt, and Koehler
Noes: None
Absent: Russell

Director Russell arrived at 9:04 a.m.

REGULAR CALENDAR
Item 1 10-Year Financial Plan (Workshop 1B)

Communications & Public Affairs Director Jeanne Mariani-Belding introduced this item and Melissa Elliott with Raftelis facilitated the workshop. Presentations were made by General Manager Ben Horenstein, Finance Director Charles McBride, Engineering Manager Michael Ban, Senior Engineer1 Manager Elysha Irish, and Watershed Resources Manager Shaun Horne.

The board provided feedback to staff, but took no formal action.

PUBLIC EXPRESSION
The board received public comments at the end of some of the presentations, as well as towards the end of the workshop.

ADJOURNMENT

There being no further business, the Board of Directors' special meeting of January 13, 2021, adjourned at 12:00 p.m.

_____

Board Secretary

Item Number: 01
Attachment: 2

MARIN MUNICIPAL WATER DISTRICT
BOARD OF DIRECTORS

MEETING MINUTES

Tuesday, January 19, 2021

Via teleconference
(In accordance with Governor Gavin Newsom's Executive Order N-29-20)

DIRECTORS PRESENT: Larry Bragman, John C. Gibson, Cynthia Koehler, and Monty Schmitt

DIRECTORS ABSENT: Larry Russell

CALL TO ORDER AND ROLL CALL
Board President Koehler called the meeting to order at 6:01 p.m.

ADOPT AGENDA
On motion made by Director Bragman and seconded by Director Gibson, the board adopted the agenda by the following roll call vote:

Ayes:	Directors Bragman, Gibson, Schmitt and Koehler
Noes:	None
Absent:	Russell

CONVENE TO CLOSED SESSION

Director Russell arrived at 6:03 p.m.

CLOSED SESSION ITEM

1. Conference with Legal Counsel – Existing Litigation
   (Government Code §54956.9)

   Walker v. Marin Municipal Water District
   Marin Superior Court
   Case No. CIV 1501914

The board and staff discussed the above item. At 7:25 p.m., the discussion ended.

CONVENE TO OPEN SESSION AT OR AFTER 7:30 P.M.

CLOSED SESSION REPORT OUT
General Counsel Molly MacLean stated that there was nothing to report out.

PUBLIC COMMENT
There were no public comments.

DIRECTORS' AND GENERAL MANAGER'S ANNOUNCEMENTS

Director Bragman and staff conversed about possible power outages and its impact due to the strong wind gusts from the prior evening.

CONSENT CALENDAR (ITEMS 2-4)

Item 2 Minutes of the Special Board of Directors' Meeting and Regular Bi-Monthly Board of Directors' Meeting of January 5, 2021

Item 3 General Manager's Report for December 2020

Item 4 Continuation of Emergency Contracting Provisions for Replacement of the Porteous Tunnel Pipeline

Director Bragman requested for a couple of documents mentioned in the General Manager's Report.

On motion made by Director Gibson and seconded by Director Russell, the board approved the Consent Calendar by the following roll call vote:

Ayes: Directors Bragman, Gibson, Russell, Schmitt, and Koehler
Noes: None
Abstain: None

REGULAR CALENDAR (ITEMS 5-8)

Item 5 Water Supply Report for December 2020

Operations Manager Paul Sellier, Communications & Public Affairs Manager Jeanne Mariani-Belding, and Water Conservation Manager Carrie Pollard provided a power point presentation to the board. Discussion ensued.

There was one public comment.

The board did not take any formal action on this agenda item.

Item 6 Marin Municipal Water District Covid-19 Leave Program Extension

Human Resources Manager Vikkie Garay brought forth this item. A brief conversation between the board and staff followed.

There were no public comments.

On motion made by Director Bragman and seconded by Director Schmitt, the board approved the extension of the district's Covid-19 Leave Program to March 31, 2021, by the following roll call vote:

Ayes:	Directors Bragman, Gibson, Russell, Schmitt, and Koehler
Noes:	None
Abstain:	None

Item 7 Update on 2020 Board Retreat Strategic Initiatives

General Manager Ben Horenstein presented this item. Discussion followed.

There was no public comment.

The board did not take any formal action on this agenda item.

Item 8 Future Meeting Schedule and Agenda Items

The board secretary brought forth this item. There was no discussion nor public comment.

The board took no formal action.

ADJOURNMENT
There being no further business, the regular bi-monthly Board of Directors' meeting of January 19, 2021, adjourned at 8:28 p.m.

_____
Board Secretary

Item Number: 02
Meeting Date: 02-02-2021
Meeting: Board of Directors

Approval Item

TITLE
Purchase of Fourteen (14) Portable Emergency Generators

RECOMMENDATION
Authorize the General Manager to purchase fourteen (14) portable generators for $946,264 from Multiquip under Sourcewell Contract No. 041719-MTQ.

SUMMARY
Over the past two wildfire seasons, the District has rented up to 29 portable generators to ensure our customers are supplied with water during extended power outages, in addition to securing backup power for San Geronimo Treatment Plant. PG&E is planning to continue the use of the Public Safety Power Shutoff (PSPS) program where customers located in high fire-threat areas may lose power for two to five days. District staff is recommending the purchase of fourteen (14) portable emergency generators as a cost-effective measure to increase our capability in responding to PSPS events and other emergencies year-round.

DISCUSSION
In 2019, PG&E initiated its Public Safety Power Shut-off (PSPS) program to reduce the likelihood of wildfire ignition by pre-emptively shutting off electric power lines when extreme fire danger conditions are forecasted. PG&E PSPS events result in power outages often occurring during summer peak demand and lasting between two to five days. Consequently, backup power generators for the distribution system are necessary to ensure our customers continue to receive water.

In preparation for potential PSPS events in the summer of 2020, the District rented 29 portable generators to power distribution pump stations and other facilities, in addition to the 2 MW portable emergency generator that was rented to provide backup power for San Geronimo Treatment Plant. During PSPS events, some portable generators are deployed to distribution pump stations that have pumps running for several hours per day while other generators are shuttled between up to 4 pump stations with lower run time requirements. The use of portable generators allows for flexibility and operation of critical pump stations throughout a PSPS event.

The District has responded to PG&E's PSPS events over the last two wildfire seasons by renting generators. However, once the wildfire season is over the generators are returned and the District no longer has use of this equipment to respond to other potential emergencies such as an earthquake that may occur outside of wildfire season. Purchasing a fleet of portable generators is more cost effective than continuing to rent generators and will greatly increase our response capability year-round. The table shown below indicates that over a period of

approximately three (3) years, the cost of renting will exceed the purchase price of the generators.

Generator Capacity	Annual Rental Cost per unit	Purchase Price per unit	Simple Break Even [Years]
56 kW	$17,158	$53,798	3.1
100 kW	$25,791	$70,706	2.7
200 kW	$38,267	$116,528	3.1

Staff is recommending the initial purchase of fourteen portable generators to supplement the seven portable generators that the District currently owns. The seven existing portable generators are 21 years old and will likely be refurbished or replaced in the next few years. In addition to the purchase of these fourteen generators, the District will need to rent additional portable generators to augment the District owned fleet for the next wildfire season. Staff is continuing to evaluate the best options for backup power including the installation of permanent generators especially where access for towable units is challenging and to determine how the actions that PG&E are taking will affect our operations during PSPS events. PG&E are continuing to improve their forecasting and notification capabilities and in 2020 successfully reduced the size of the PSPS affected areas.

District staff is recommending the purchase of fourteen Multiquip portable diesel generators. The District has rented Multiquip generators from Sunbelt Rentals the last two wildfire seasons, and staff have found those generators to perform reliably and meet the needs of the distribution system. Each diesel generator is compliant with EPA Tier 4 Final emissions standards. The Multiquip generators are available for purchase directly from Multiquip by means of government bid pricing established by Sourcewell, a national cooperative contract purchasing solution on behalf of its member agencies which include all government, education, and non-profit agencies nationwide. This process leverages the aggregation of volume from members nationwide to receive competitive pricing on equipment and services. Multiquip has indicated that the generators are available and can be delivered within 30 days.

FISCAL IMPACT
The total cost to purchase fourteen (14) portable generators is $946,264.

As part of the FY 2021 Capital Improvement Program, staff has budgeted $1,000,000 for the purchase of portable generators to power distribution pump stations in the event of a power outage.

Generator Capacity	Quantity (units)	Unit Cost	Total Cost
56 kW	8	$53,798	$430,384
100 kW	4	$70,706	$282,824
200 kW	2	$116,528	$233,056
TOTAL	14		**$946,264**

ATTACHMENT(S)
None

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Operations Division	**Paul Sellier** **Operations Director**	**Ben Horenstein** **General Manager**

Item Number: 03
Meeting Date: 02-02-2021
Meeting: Board of Directors

Approval Item

TITLE
Purchase of Agilent Technologies ICP-MS

RECOMMENDATION
Authorize the General Manager to purchase the Agilent 7850 ICP-MS for $137,881.84.

SUMMARY
The Water Quality Lab performs water quality compliance testing as well as operational monitoring to ensure that we meet or exceed water quality standards. The ICP-MS is essential for the analysis of trace metals in our treated and source waters, including compliance with the Lead in Schools regulatory program. The existing lab equipment has been in service since 2007 and is no longer supported by the manufacturer. Staff is seeking to purchase a new ICP-MS in the amount of $137,881.84.

DISCUSSION
The analysis of trace metals contained in our source and finished waters is a regulatory requirement (California Code of Regulations, Title 22, Article 4), and the lab is certified by the State of California to conduct the analysis of 16 metals using this instrument. Most metals, ranging from Aluminum to Vanadium, are analyzed following USEPA method 200.8 including lead testing from customer homes and at schools through the Lead in Schools program.

Compared to other techniques used for trace metal analysis, the ICP-MS offers advantages with regard to sensitivity, selectivity and efficiency. The ICP-MS can easily achieve analysis down to detection limit requirements, and can generate sub-part-per-billion results if needed. With the new ICP-MS, the lab will be ready for potential future regulation changes that require lower detection limits.

Performing trace metals analysis in-house saves money and allows Marin Water control of the quality and accuracy of data that is reported to the State. In-house analysis allows the lab to re-analyze and verify results when needed to ensure all data submitted to the State are accurate and free of errors. In addition, in-house analysis gives the lab the ability for quick turnaround of analysis to support programs such the Lead in Schools program. Over the life of the existing (now obsolete) lab equipment approximately 7,000 analyses were completed. Each analysis has an average cost of approximately $50 per sample at a commercial lab which over the life of the equipment equates to more than twice the purchase cost of the equipment.

In the fall of 2020, the lab did extensive research for this purchase, including making and providing blind samples to multiple potential vendors for their analysis.

The following table provides a summary of the quotes received:

Vendor	Quote	Rank
Agilent Technologies	$137,881.84	1
Thermo Electron	$122,763.33	2
Perkin Elmer	$135,480.40	3

Based upon staff review of the instrument performance and the submitted quotes staff is requesting board authorization for the purchase of the Agilent 7850 ICP-MS for $137,881.84.

FISCAL IMPACT
The purchase cost of $137,881.84 is included in the current FY 21 capital equipment budget for the Water Quality Lab.

ATTACHMENT(S)
None

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Operations Division	**Paul Sellier** **Operations Division Manager**	**Ben Horenstein** **General Manager**

Item Number: 04
Meeting Date: 02-02-2021
Meeting: Board of Directors

Approval Item

TITLE

Award of Contract No. 1916, Kent Lake Aerator Vent Lines Replacement Project, in the amount of $59,681.25, to Associated Underwater Services, Inc., to replace the Kent Lake Aerator vent and air lines, and install a new aerator lifting rope

RECOMMENDATION

Approve the Resolution authorizing award of Contract No. 1916, Kent Lake Aerator Vent Lines Replacement Project to Associated Underwater Services, Inc.

SUMMARY

The Operations Committee reviewed this item on January 15, 2021, and referred it to a future Bi-Monthly Meeting of the Board of Directors with the Operations Committee's recommendation to proceed with the project.

On January 21, 2021, the District received and opened three (3) bids for the Kent Lake Aerator Vent Lines Replacement Project to replace two (2) 2-inch HDPE vent lines at 180-foot lengths each, one (1) 1-inch HDPE air supply line at 200 feet in length and the aerator steel lifting cable. Associated Underwater Services, Inc. submitted the lowest responsive and responsible bid in the amount of $59,681.25. Therefore staff recommends that the Board of Directors approve the Resolution which awards Contract No. 1916 to Associated Underwater Services, Inc. in the amount of $59,681.25, authorizes the General Manager to execute any necessary amendments to Contract No. 1916 which do not exceed $5,968 and deems the project categorically exempt from the California Environmental Quality Act (CEQA) pursuant to Section 15302(c) of the CEQA Guidelines as the project is a repair of the existing lake aerator system with negligible or no expansion of capacity.

DISCUSSION

The Kent Lake Aerator Vent Lines Replacement (Project) is a component of the District's Capital Improvement Program. In March 2019 divers made repairs to the Kent Lake aerator and found additional damage to the aerator's vent lines. The additional damage to the vent lines was caused by the aerator's lifting wire rope rubbing on the HDPE vent line piping. This contract will replace the vent and air lines, install a new aerator lifting rope and maintain separation between the lifting cable and the HDPE vent and air lines.

The Project will take place in the location shown on the map provided in Attachment 2.

Three bids were received on January 21, 2021 for the Project. Bid results are provided in Table 1.

Table 1
Bid Results
Kent Lake Aerator Vent Lines Replacement Project

Apparent Bid Rank	Contractor Name	Bid Amount
1.	Associated Underwater Services, Inc.	$59,681.25
2.	Harbor Offshore, Inc.	$92,753
3.	Underwater Resources, Inc.	$103,000

Summaries of the estimated Project costs and schedule are provided below.

Budget:

Contract Award:	$59,681.25
Contingency:	$5,968
Materials and Professional Fees:	$9,500
District Labor/Inspection:	$15,000
Total Budget:	$90,149.25
Budget Category:	A1A04

Project Implementation:

Project Advertisement:	January 7, 2021
Bid Opening:	January 21, 2021
Project Award:	February 2, 2021
Estimated Completion Date:	May 3, 2021
Duration:	90 days

ENVIRONMENTAL REVIEW

The Project is Categorically Exempt pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15302(c), Replacement or Reconstruction. The Project qualifies for exemption pursuant to Section 15302(c) inasmuch as it is the repair of the existing lake aerator system with negligible or no expansion of capacity. A copy of the draft Notice of Exemption is enclosed as Attachment 3.

ATTACHMENTS

1. Resolution
2. Site Map
3. Notice of Exemption

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Engineering		
	Michael Ban **Director of Engineering**	**Ben Horenstein** **General Manager**

MARIN MUNICIPAL WATER DISTRICT

RESOLUTION NO. ____

RESOLUTION OF THE BOARD OF THE MARIN MUNICIPAL WATER DISTRICT AUTHORIZING AWARD OF CONTRACT NO. 1916, KENT LAKE AERATOR VENT LINES REPLACEMENT PROJECT

WHEREAS, on January 21, 2021, the District received and opened three (3) bids for the Kent Lake Aerator Vent Lines Replacement Project; and

WHEREAS, the bid of $59,681.25 submitted by Associated Underwater Services, Inc. for the Kent Lake Aerator Vent Lines Replacement under Contract No. 1916 was the lowest responsible bid submitted therefor; and

WHEREAS, the project is Categorically Exempt under the California Environmental Quality Act (CEQA) pursuant to Section 1530 (c) of the CEQA Guidelines inasmuch as it is the repair of the existing lake aerator system with negligible or no expansion of capacity.

NOW THEREFORE, BE IT RESOLVED the Board hereby adopts the findings set forth herein and authorizes award of Contract No. 1916 to said low bidder, and further authorizes and directs the General Manager and Secretary to execute said contract on behalf of the District upon receipt of a performance bond, payment bond, proof of insurance, and the executed contract for the work from said bidder.

BE IT FURTHER RESOLVED that upon complete execution of said contract, the bonds and/or checks of the other bidders are to be returned to said other bidders, and all bids other than that of Associated Underwater Services, Inc. are to be rejected.

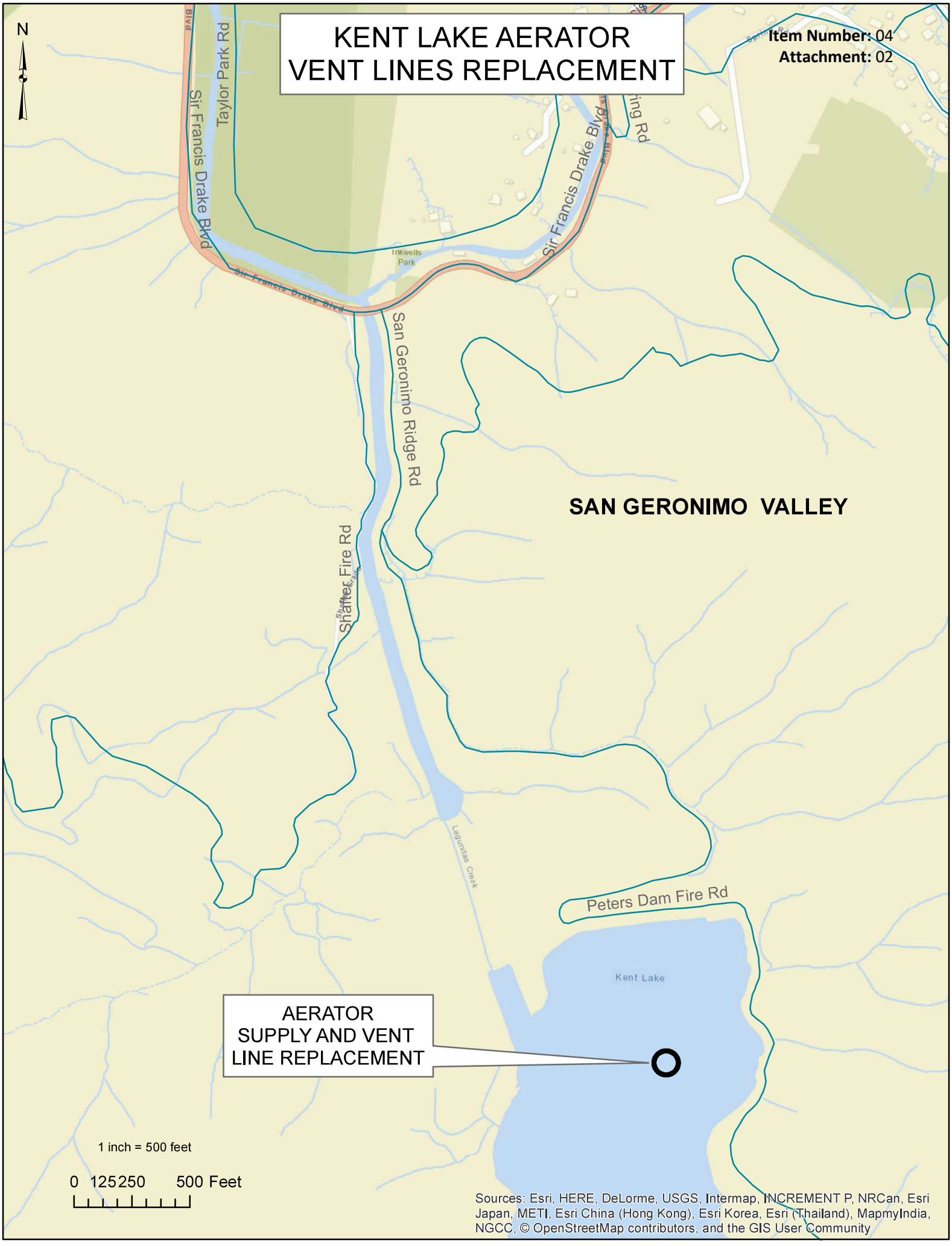
PASSED AND ADOPTED this 2nd day of February, 2021, by the following vote of the Board of Directors.

AYES:
NOES:
ABSENT:

_____
President, Board of Directors

ATTEST:

_____
Secretary


KENT LAKE AERATOR
VENT LINES REPLACEMENT
Item Number: 04
Attachment: 02
N
Taylor Park Rd
Sir Francis Drake Blvd
Sir Francis Drake Blvd
Inkwells Park
Sir Francis Drake Blvd
San Geronimo Ridge Rd
SAN GERONIMO VALLEY
Shafter Fire Rd
Lagunitas Creek
Peters Dam Fire Rd
Kent Lake
AERATOR
SUPPLY AND VENT
LINE REPLACEMENT
1 inch = 500 feet
0 125250 500 Feet
Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

Item Number: 04
Attachment: 3

Notice of Exemption

MARIN MUNICIPAL WATER DISTRICT

Filing Requested By and When Filed Return To:

Marin Municipal Water District
220 Nellen Ave
Corte Madera, CA 94925
Attn: Michael Ban, Director of Engineering

Project Title: Kent Lake Aerator Vent Lines Replacement (D20022)

Project Location: Kent Lake, San Geronimo Valley **Project Location – County:** Marin

Project Description: The Kent Lake Aerator Vent Lines Replacement is a component of the District's Capital Improvement Program. This project will replace two (2) 2-inch HDPE vent lines at 180-foot lengths each and one (1) 1-inch HDPE air supply line at 200 feet in length. The air supply line and vent lines support the Kent Lake Aerator. The aerator is used to ensure that adequate oxygen is present in the water released for fish during the summer months and that any water diverted to treatment is well oxygenated.

Public Agency Approving Project: Marin Municipal Water District

Name of Person or Agency Carrying Out Project: Marin Municipal Water District

CEQA Exemption Status: Categorical Exemption Section 15302(c), Replacement or Reconstruction

Reason for Exemption: The project qualifies for exemption pursuant to Section 15302(c) of the CEQA Guidelines inasmuch as it is the repair of the existing lake aerator system with negligible or no expansion of capacity.

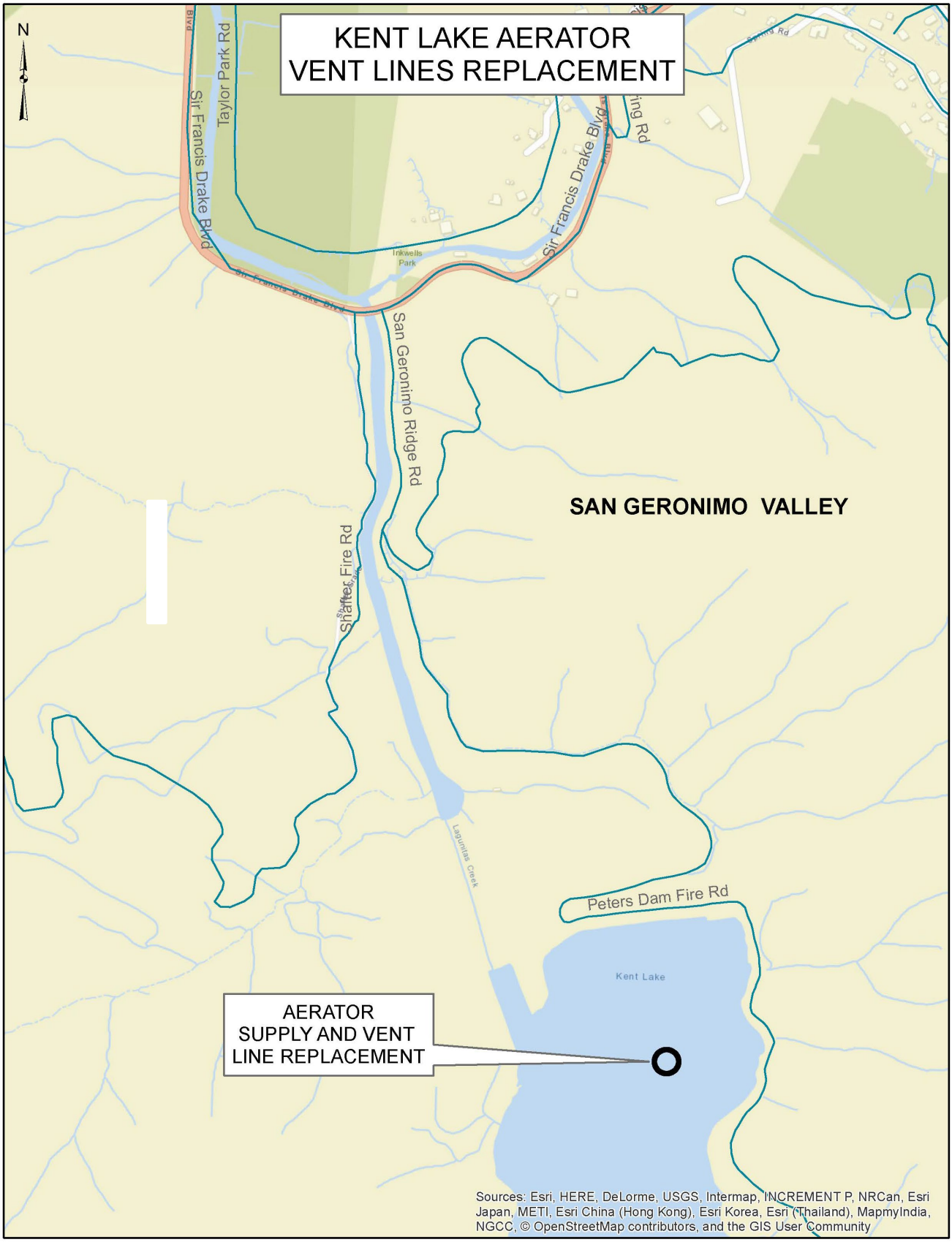
Project Approval: The Marin Municipal Water District Board of Directors approved the award of a contract for project construction, which represents project approval as defined by Section 15352(a) of the Guidelines for Implementation of the California Environmental Quality Act, at their regularly scheduled meeting on February 2, 2021.

Lead Agency Contact Person: Michael Ban, Marin Municipal Water District **Telephone:** (415) 945-1435

_____ _____

Michael Ban, Director of Engineering **Date**

Figure 1: Kent Lake Aerator Vent Lines Replacement



SOURCE: MMWD 2021

MARIN MUNICIPAL WATER DISTRICT

Item Number: 05
Meeting Date: 02-02-2021
Meeting: Board of Directors

Approval Item

TITLE
Coastal Conservancy Grant for Forestry Restoration

RECOMMENDATION

1. Authorize the General Manager to execute Amendment No. 6 to the Cooperative Agreement between the Golden Gate National Parks Conservancy and Marin Water
2. Approve the disbursement of $70,000 from the Mt. Tamalpais Watershed Fund which was donated by the Golden Gate National Parks Conservancy as part of a grant from the California Coastal Conservancy

SUMMARY
On March 2, 2020, the Golden Gate National Parks Conservancy received a grant in the amount of $725,800 from the California Coastal Conservancy for the development of a regional, multi-benefit forest health strategy for Marin County's public lands. The grant included $70,000 to support a 10 acre demonstrational forestry restoration project on Marin Water's Mt. Tamalpais Watershed Lands and $70,000 for One Tam staff to support communication and outreach associated with forestry restoration work.

With the Operations Committee recommendation for approval Staff is requesting the Board of Directors authorize the General Manager to execute Amendment No. 6 to the Cooperative Agreement and approve the dispersal of $70,000 from the Mt. Tamalpais Watershed Fund which was donated by the Golden Gate National Parks Conservancy to reimburse the District for work associated with the forest restoration demonstration project.

DISCUSSION
In 2014, the Mt. Tam's four land management agencies: the Marin Municipal Water District, National Parks Service, California State Parks, Marin County Parks, and the Golden Gate National Parks Conservancy launched the Tamalpais Lands Collaborative-now called One Tam. In accordance with the Memorandum of Understanding signed by the Tamalpais Lands Collaborative (TLC) partner agencies, a "5 Year List" of projects and programs that are compatible with the purpose and vision of the TLC was developed. Each year One Tam develops an annual work plan which outlines collaborative projects and programs that will be moved forward. Forest health and resiliency is currently an area of focus of the One Tam collaborative and on March 2, 2020, the Golden Gate National Parks Conservancy was awarded a $725,800 grant to support the development of a regional forest health strategy for Marin County's public lands and the implementation of 10 acre demonstration project.

As part of the California Coastal Conservancy Grant, $140,000 was budgeted to support a demonstration project on the District's watershed lands. The work was implemented as part of

the District's Biodiversity, Fire and Fuels Integrated Plan (BFFIP) and associated Environmental Impact Report (EIR). The demonstration project entailed forestry work within Sudden Oak Death (SOD) impacted areas of the watershed and was designed to disrupt the disease cycle through removal of dead and diseased tan oak trees. The objective of the work is to restore healthy forest stands, improve native tree growth and reduce accumulated fuels associated with dead trees. The grant provided $70,000 for implementation of forestry work in up to 10 acres of un-treated SOD impacted forests around Potrero Meadow and an additional $70,000 for GGNPC staff to carry out public outreach components to raise awareness around forest resiliency and wildfire issues.

To reimburse the District for the expenses associated with implementation of the 10 acre demonstration project around Potrero Meadow the GGNPC contributed $70,000 to the Mt. Tamalpais Watershed Fund. The forestry restoration work was completed by Staff and Contractors. The demonstration project was part of a larger forestry restoration effort that achieved 70 acres of forest restoration work around Potrero Meadow to address fuel build up associated with SOD and Douglas fir encroachment into sensitive meadow habitats. Amendment No.6 to the Cooperative Agreement between GGNPC and Marin Water identifies Marin Water as a sub-grantee of the California Coastal Conservancy Grant for the 10 acre demonstrational forest restoration project. On September 18, 2020, the GGNPC donated $70,000 to the Mt. Tamalpais Watershed Fund staff is recommending that the Board of Directors approve the disbursement of $70,000 from the Mt. Tamalpais Watershed Fund.

FISCAL IMPACT
No anticipated fiscal impacts.

ATTACHMENT(S)
1. GGNPC Donation Letter to Mt. Tamalpais Fund
2. Amendment No. 6 to the Cooperative Agreement between GGNPC and Marin Water

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Watershed	**Crystal Yezman** **Director of System Maintenance and Natural Resources**	**Ben Horenstein** **General Manager**

GOLDEN GATE NATIONAL PARKS CONSERVANCY

PARKS FOR ALL FOREVER™

September 10, 2020

Marin Community Foundation
5 Hamilton Landing, Suite 200
Novato, CA 94949
Attn: Alix Derby Salkin, VP for Philanthropic Partnerships

Re: Donation to Mount Tamalpais Watershed Fund for MMWD Work on Forest Resiliency

Dear Ms. Salkin,

Please accept the Parks Conservancy's donation of $70,000 to be added to the "Mount Tamalpais Watershed Fund" for Forest Resliency projects conducted by the Marin Municipal Water District. The donation will be wired to MCF within the next two weeks.

Sincerely,

J Mark Jenkins
VP of Finance
Golden Gate National Parks Conservancy

cc: Garrett Lee, GGNPC
Caroline Christman, GGNPC
Danny Franco, GGNPC
Shaun Horn, MMWD

MCF 2020_09_10 MMWD Donation $70,000.00 Letter

Final Audit Report 2020-09-10

Created:	2020-09-10
By:	Garrett Lee (glee@parksconservancy.org)
Status:	Signed
Transaction ID:	CBJCHBCAABAAxk7I_EROyR7PcLWmy92A1hHuCbZtCVVv

"MCF 2020_09_10 MMWD Donation $70,000.00 Letter" History

Document created by Garrett Lee (glee@parksconservancy.org)
2020-09-10 - 7:42:25 PM GMT- IP address: 173.164.254.145

Document emailed to J. Mark Jenkins (jjenkins@parksconservancy.org) for signature
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Document e-signed by J. Mark Jenkins (jjenkins@parksconservancy.org)
Signature Date: 2020-09-10 - 7:44:26 PM GMT - Time Source: server- IP address: 71.198.251.91

Signed document emailed to J. Mark Jenkins (jjenkins@parksconservancy.org) and Garrett Lee (glee@parksconservancy.org)
2020-09-10 - 7:44:26 PM GMT

AMENDMENT NO. 6
COOPERATIVE AGREEMENT BETWEEN THE GOLDEN GATE NATIONAL PARKS CONSERVANCY
AND THE
MARIN MUNICIPAL WATER DISTRICT

GRANT-FUNDED FOREST RESTORATION PROJECT

This contract amendment for the Grant-Funded Forest Restoration Project is entered into by and between Marin Municipal Water District ("District") and the Golden Gate National Parks Conservancy ("Conservancy").

For good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, the parties hereto agree as follows:

Section 1. Recitals:

A. District and Conservancy entered into a Cooperative Agreement on January 12, 2015 ("Agreement").

B. The parties desire to enter into an amendment to the Agreement to provide for the Coastal Conservancy-funded forestry restoration project

Section 2. Terms:

A. Amendment to Agreement: This Amendment No. 6 modifies the Agreement. Except for the modifications contained herein, all the terms of the Agreement shall apply.

B. This Amendment No. 6 shall remain in effect until June 30, 2021.

C. Terms: The parties desire to carry out the Grant-Funded Forest Restoration Project as follows:

Project Objective: The objective of the Project is to support a demonstration forestry project on 10 acres of the District's watershed. As part of the Golden Gate National Parks Conservancy's $725,800 grant from the California Coastal Conservancy, there has been $70,000 allocated to support a 10 acre demonstrational forestry restoration project on Marin Water's Mt. Tamalpais Watershed Lands and $70,000 for One Tam staff to support communication and outreach associated with forestry restoration work.

The objective of the project is to restore healthy forest stands, improve native tree growth and reduce accumulated fuels associated with dead trees. The grant includes $70,000 for implementation of forestry work in up to 10 acres of un-treated SOD impacted forests around Potrero Meadow and includes an additional $70,000 for GGNPC staff to carry out public outreach components to raise awareness around forest resiliency and wildfire issues.

2. Statement of Work:

A. The Conservancy shall:

1. **Budget:** Conservancy shall assume the following responsibilities pertaining to the overall project budget:
   - **a.** Provide general services of its existing management staff as defined within the Cooperative Agreement.
   - **b.** Serve as lead fiscal agent, grant manager, and overall management and allocation of funds provided by the State Coastal Conservancy to meet the project objective and acquire the stated deliverables.
   - **c.** Provide funding in the amount not exceed $70,000, in the form of a transfer to the Marin Community Foundation, which will then be transferred to the District as reimbursement for implementation costs incurred under the Project.

2. **Staff:** Provide Conservancy staff to fill the following project roles: Project Manager, Grant Manager.

3. **Community Engagement:** Develop and implement a strategy to incorporate community engagement and design into the project:
   (a) Lead public outreach components to raise awareness around forest resiliency and wildfire issues.

4. **Reporting:** Report on performance and expenditure of funds relative to this Project on a quarterly basis or upon specific request, as described in Cooperative Agreement MA-5311 to the District.

B. The District shall:

1. **Budget:**
   (a) Budget for the Project in the amount not exceed $70,000 in MMWD Fiscal Year 2020/21. This budget will be used solely to implement the demonstration forestry restoration project at Potrero Meadow in the designated 10-acre area.

IN WITNESS HEREOF, the Parties hereto have signed their names and executed this Amendment No. 6.

Dated: _____ **GOLDEN GATE NATIONAL CONSERVANCY**

By _____
Nicolas Elsishans
Executive Vice President and Chief Operating Officer

Dated: _____ **MARIN MUNICIPAL WATER DISTRICT**

By _____
Ben Horenstein
General Manager

Item Number: 06
Meeting Date: 02-02-2021
Meeting: Board of Directors

Approval Item

TITLE
Continuation of Emergency Contracting Provisions for Replacement of the Porteous Tunnel Pipeline

RECOMMENDATION
Continue the invocation of the District's emergency contracting provisions and authorization of the General Manager to execute Contract No. 1935 with W. R. Forde Associates, without advertisement, to ensure prompt replacement of the leaking Porteous Tunnel pipeline under the Porteous Tunnel Emergency Pipeline Replacement Project (F21001).

SUMMARY
In response to the discovery that the critical 26-inch welded steel transmission pipeline inside Porteous Tunnel has broken and is leaking, on November 17, 2020, the board adopted Resolution No. 8608 invoking the District's emergency contracting procedures, which allows emergency contracts to be awarded without solicitation for bids when the contracts are necessary to respond to an emergency situation, and authorizing the General Manager to execute Contract No. 1935 with W. R. Forde Associates, without advertisement, to ensure prompt replacement of the leaking Porteous Tunnel pipeline under the Porteous Tunnel Emergency Pipeline Replacement Project (F21001). District Code Section 2.90.055(c) requires the Board to review the emergency action and determine by a 4/5th vote whether there is a need to continue the emergency action at each subsequent regularly scheduled Board meeting until the emergency is terminated.

DISCUSSION
In approximately 1919, the District constructed a concrete pipeline, estimated at 30-inch outside diameter (OD) and 23-inch inside diameter (ID), to convey water from Alpine Reservoir to Pine Mountain Tunnel (PMT), and from PMT to Phoenix Lake, including construction of the 230-foot long Porteous Tunnel, which contained the 30-inch concrete pipe. Leakage from the 1919 pipeline caused the District to replace it in 1926 with a 26-inch (OD) welded steel pipe.

District staff unexpectedly discovered that water flowing at Five Corners on the watershed is coming from a break in the critical 26-inch transmission pipeline inside Porteous Tunnel. This pipeline is part of the District's Concrete Road Pipeline network that provides water to the Ross Valley, which constitutes approximately 23% of the District's customers, and is the only section of 1926 pipeline still in service.

Porteous Tunnel is located on the watershed and travels under the intersection of Five Corners, where Concrete Pipe Road, Deer Park Fire Road, Bald Hill Road and Shaver Grade all meet. The pipeline inside the tunnel is 45-feet below grade and is over 250-feet long. The tunnel has caved in and is inaccessible, which prohibits the District from simply repairing this critical pipeline. Replacement of the Porteous Tunnel pipeline is necessary and requires the services of a licensed contractor with specialized construction equipment and experienced personnel to be accomplished.

On November 17, 2020, the board approved Resolution No. 8608 invoking the District's emergency contracting provisions and authorizing the General Manager to execute Contract No. 1935 with W. R. Forde Associates, without advertisement, to ensure prompt replacement of the leaking Porteous Tunnel pipeline under the Porteous Tunnel Emergency Pipeline Replacement Project (F21001). In accordance with District Code Section 2.90.055 (c), the Board must determine, by a four-fifths vote, the need to continue the emergency action at every regularly scheduled meeting thereafter until the action is terminated. The emergency conditions related to the leaking Porteous Tunnel pipeline remain, and will continue to remain until the pipeline is replaced. While work has commenced on the Porteous Tunnel Pipeline repair, the work is not yet complete and emergency circumstances persist. Therefore, District staff recommend that the board continue the invocation of the District's emergency contracting provisions to ensure replacement of the Porteous Tunnel pipeline under the Porteous Tunnel Emergency Pipeline Replacement Project (F21001).

FISCAL IMPACT
None

ATTACHMENT(S)
1. Resolution

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Engineering	Michael Ban	Ben Horenstein
	Michael Ban **Director of Engineering**	**Ben Horenstein** **General Manager**

MARIN MUNICIPAL WATER DISTRICT

RESOLUTION NO. _____

RESOLUTION OF THE BOARD OF DIRECTORS OF THE MARIN MUNICIPAL WATER DISTRICT CONTINUING THE EMERGENCY CONTRACTING PROVISIONS FOR REPLACEMENT OF THE PORTEOUS TUNNEL PIPELINE

WHEREAS, the Marin Municipal Water District, a special purpose municipal corporation, is authorized by District Code Section 2.90.055 to award construction contracts without advertisement in certain emergency situations; and

WHEREAS, on November 17, 2020, the Marin Municipal Water District Board of Directors unanimously adopted Resolution 8608 invoking the District's emergency contracting provisions and authorizing the General Manager to execute Contract No. 1935 with W.R. Forde Associates for the Porteous Tunnel Emergency Pipeline Replacement Project (Project), without advertisement, to replace the leaking pipeline in Porteous Tunnel; and

WHEREAS, the pipeline in Porteous Tunnel is part of the District's Concrete Road Pipeline network that provides water to the Ross Valley, which constitutes approximately 23% of the District's entire customer base; and

WHEREAS, the leak on the pipeline in Porteous Tunnel is a significant emergency in that it presents a risk to the District's ability to provide water to customers in the Ross Valley and if not promptly repaired, could cause substantial erosion that may undermine the public roadway at the Five Corners intersection; and

WHEREAS, the District proposes to repair and complete minor alterations to the Porteous Tunnel facilities and replace over 250 feet of pipeline to ensure continued supply of safe drinking water to Ross Valley under the Project; and

WHEREAS, the Board of Directors finds that a local emergency situation continues to exist due to the leak in the Porteous Tunnel pipeline and given the work to complete the repair is ongoing; and

WHEREAS, the Board of Directors finds this continued emergency action to ensure replacement of the Porteous Tunnel pipeline is necessary to respond to the current emergency situation.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS, pursuant to District Code Section 2.90.055, a continued significant emergency situation is declared to exist due to the leak in the Porteous Tunnel pipeline and this continued action is necessary to respond to the current emergency situation.

PASSED AND ADOPTED this 2nd day of February, 2021, by the following vote of the Board of Directors.

AYES:

NOES:

ABSENT:

_____

President, Board of Directors

ATTEST:

_____

Board Secretary

Item Number: 07
Meeting Date: 02-02-2021
Meeting: Board of Directors

Informational Item

TO: Board of Directors

FROM: Paul Sellier, Operations Director

THROUGH: Ben Horenstein, General Manager

DIVISION NAME: Operations

ITEM: Water Supply Update

SUMMARY
Overall, water supply is 68% of average storage level for this time of year and while forecasted rains look promising, it is too early to assess the effect of winter precipitation on the water supply going into summer. As presented at the January 19, 2021 board meeting, staff are developing a number of items related to water supply and conservation in preparation for continued dry conditions. The 10-day weather outlook indicates that rain is likely over this period. A more detailed water supply report will be provided at the next board meeting.

DISCUSSION
Highlights:

- As of January 24, 2021 the District had 44,415 acre-feet of reservoir water storage which is 68% of historical average and 55.8% of total capacity.
- As of January 25, 2021 Lake Sonoma had 155,820 acre-feet of water which is 63.6% of capacity and approximately 68% of historical average for this time of year.

FISCAL IMPACT
None.

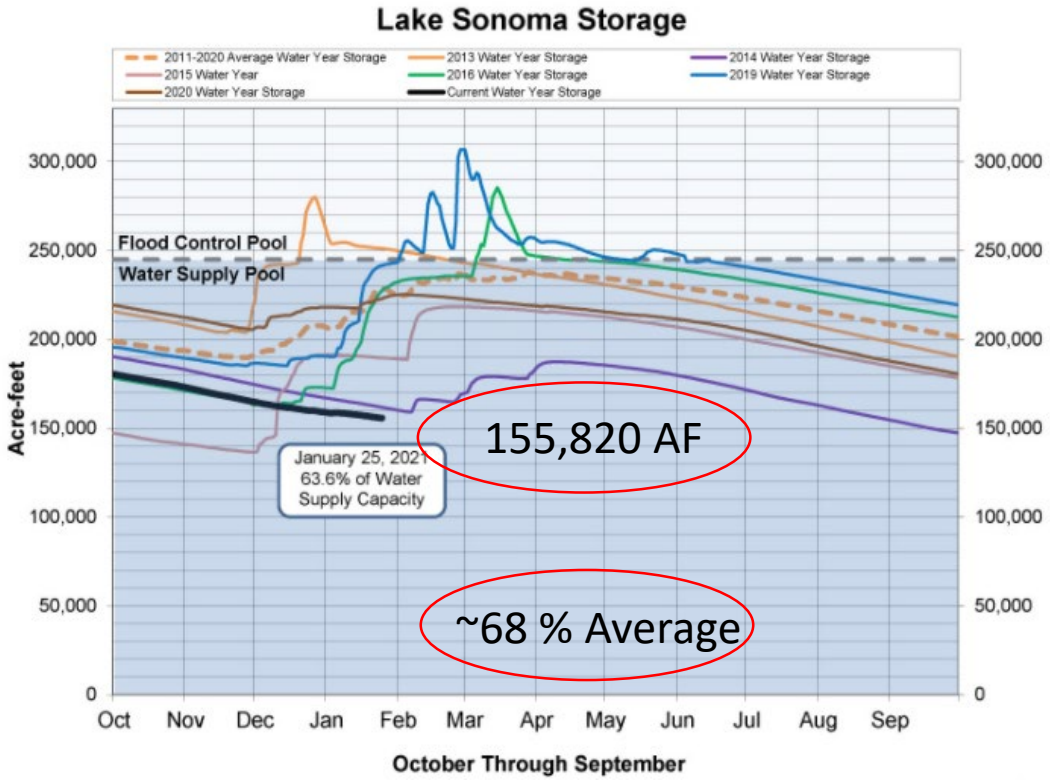
ATTACHMENT(S)
1. Reservoir Storage Levels

Item Number: 07
Attachment: 1

Reservoir Storage Levels

Marin Water Storage 1-24-21

	Current Storage [AF]	Maximum Storage [AF]	Percent of Maximum Storage	Percent of Average Storage
Alpine	4,834	8,891	54%	--
Bon Tempe	3,736	4,017	93%	--
Kent	20,092	32,895	61%	--
Lagunitas	350	350	100%	--
Nicasio	9,542	22,430	43%	--
Phoenix	405	411	98%	--
Soulajule	5,456	10,572	52%	--
Total	46,030	79,566	56%	68%



Item Number: 08
Meeting Date: 02-02-2021
Meeting: Board of Directors

Approval Item

TITLE
Rental of Temporary Portable Generators for Soulajule Pump Station

RECOMMENDATION
Authorize the General Manager to negotiate and execute an agreement with Sunbelt Rentals for Rental of Temporary Portable Generators to power Soulajule Pump Station in an amount not to exceed $1,267,748 that includes a $100,000 contingency for necessary amendments to the agreement.

SUMMARY
Due to the potential for ongoing dry weather conditions, staff recommends that the district proceed with the rental of two 1,000 KW diesel generators needed to supply power to Soulajule Pump Station. District staff received three rental quotes from heavy equipment rental companies and recommends proceeding with Sunbelt Rentals that provided the lowest total cost. The rental agreement will include the rental of two 1,000 KW portable generators, power cables, spill basins, maintenance, and fueling service to support a continuous operation over a 3-month period.

DISCUSSION
Constructed in 1979 to provide additional storage capacity following the drought of 1976, Soulajule Reservoir has a maximum storage capacity of 10,572 acre-feet. At the base of the dam, Soulajule Pump Station was built at the same time to pump reservoir water over a nearby ridge and into Nicasio Reservoir. The electricity distribution infrastructure in this rural area of the County is inadequate to provide the energy requirements for the pumping plant, therefore two portable, temporary 1,000 kW generators will be brought in to provide the necessary power.

While there is still most of the rainy period still to come staff is preparing for ongoing dry conditions. As part of those preparations, staff is proposing to secure rental generators to allow the transfer of approximately 3,000 acre-feet of reservoir water over a three-month period from Soulajule Resevoir to Nicasio Reservoir. In order to ensure that a Soulajule water transfer is necessary pumping operations will not begin until late spring.

The District received three competitive quotes from reputable heavy equipment companies for the rental of two 1,000 KW generators, maintenance and fueling service for Soulajule Pump Station. Staff recommends proceeding with Sunbelt Rentals based on the competitive pricing received as well as the reliable service experienced working with Sunbelt throughout the District's portable generator rental contracts over the past two wildfire seasons. The rental agreement for Soulajule Pump Station will include the rental of two 1,000 KW portable generators, power cables, spill basins, maintenance every 300 hours of operation, and fueling

service. Estimated costs for the generator rental and diesel fueling services are shown in the table below.

	Sunbelt Rentals	Herc Rentals	Peterson Power
Rank	1	2	3
Generator Rental Contract	$ 139,683	$ 264,306	$ 348,639
Diesel Fueling Service	$1,028,065	$ 977,980	$1,318,032
Total Estimated Cost	$1,167,748	$1,242,286	$1,666,671

Delivery of the rental generators is expected at the beginning of March.

FISCAL IMPACT

The total cost to rent and operate the temporary generators continuously over a 3-month period is estimated to be $1,167,748. However, the actual expenses will vary based on the length of time the generators are operated and market cost of fuel. Staff is including a contingency of $100,000 to address this uncertainty. Funds will be appropriated from the undesignated/unreserved Operating Fund balance for this unbudgeted expenditure.

Budget	Amount
Generator Rental Contract	$ 139,683
Estimated Fueling	$ 1,028,065
Contingency	$ 100,000
Total Budget	$ 1,267,748

ATTACHMENT(S)

None

DEPARTMENT OR DIVISION	DIVISION MANAGER	APPROVED
Operations Division	**Paul Sellier** **Operations Director**	**Ben Horenstein** **General Manager**

Item Number: 09
Meeting Date: 02-02-2021
Meeting: Board of Directors

Informational Item

TO: Board of Directors

FROM: Crystal Yezman, Director of System Maintenance and Natural Resources

THROUGH: Ben Horenstein, General Manager

DIVISION NAME: Facilities & Watershed

ITEM: 2020 UWMP Demand Projections

SUMMARY
In preparation for the development of the 2020 Urban Water Management Plan, nine members of the Sonoma-Marin Saving Water Partnership coordinated and conducted a joint update of their water demand projections and water conservation planning efforts. The effort resulted in the 2020 Water Demand and Conservation Report (Report).

DISCUSSION
In preparation for development of the 2020 Urban Water Management Plan (UWMP) updates, nine members of the Sonoma-Marin Saving Water Partnership (SMSWP or Water Contractors) coordinated to conduct a joint update of their water demand projections and water conservation planning efforts (i.e., the *2020 Water Demand and Conservation Project*). The participating SMSWP members include: City of Cotati, City of Petaluma, City of Rohnert Park, City of Santa Rosa, City of Sonoma, Marin Municipal Water District, North Marin Water District, Town of Windsor, and Valley of the Moon Water District.

The goals of the *2020 Water Demand and Conservation Project* were to apply a common methodology to conduct the following analysis for each Water Contractor:

- Evaluate and document recent historical water use characteristics and trends, including population and account growth;
- Estimate projected water demands for the years 2025 through 2045 to support both the State regulated 2020 Urban Water Management Plan (UWMP) update and coordinate planning efforts with Sonoma County Water Agency (Sonoma Water);
- Update the suite of common regional conservation measures being considered for future implementation;
- Review and document past participation in water conservation programs; and
- Estimate the potential water savings associated with future water conservation program implementation.

The 2020 Water Demand and Conservation Project was conducted in accordance with the 2020 UWMP requirements to develop water demand projections that consider water use by customer sector, incorporate distribution system water loss, and account for anticipated water savings. The water demand projections were developed for the District using a land-use based approach that is consistent with these requirements and previous UWMP demand projection methodologies, and can be incorporated into the District's 2020 UWMP submission to the California Department of Water Resources.

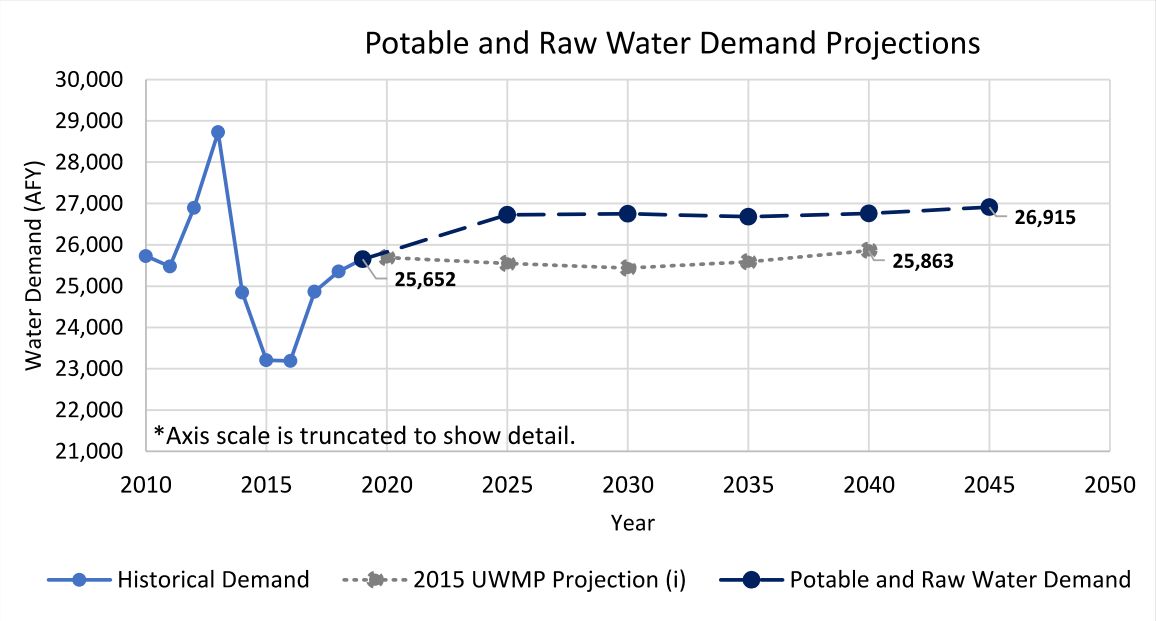
The 2020 Water Demand and Conservation Project resulted in a Report which provides the regulatory context for the demand projections as well as new requirements related to UWMPs and long-term demand planning that agencies will need to consider in development of the 2020 UWMPs. Over the years, the District has worked to increase water efficiency (conservation) in response to both the SB X7-7 UWMP requirements and as part of the .District's ongoing efforts to maximize use of our water supply. Demand reductions have been achieved through the implementation of the plumbing code and water conservation programs, including some administered by the District and some administered through the regional SMSWP.

The Report also describes historical water use patterns and characteristics within the District which are used to develop projected water demands through the year 2045. The assumptions and methodology used to project demands are consistent throughout the region.

The Report used the Alliance for Water Efficiency's Water Conservation Tracking Tool to quantify past participation in conservation programs and estimate the active and passive savings associated with historic programs. A detailed analysis of program participation trends for select conservation programs is included in the Report.

In coordination with the SMSWP, the region screened various water conservation measures. The Report identifies individual programs and program scenarios for potential future implementation by the District and for consideration by the region as large scale, regional programs. The results of a benefit-cost analysis and an estimate of the potential water savings associated with these conservation programs is provided in the Report.

The final projected production for 2045, which includes raw water, non-revenue water, customer water demands and passive conservation, is projected to be 26,915 acre feet (AF).



FISCAL IMPACT
None

ATTACHMENT(S)
1. Final Water Demand Conservation Report

2020 Water Demand Analysis and Water Conservation Measure Update

Marin Municipal Water District

December 2020
(EKI C00004.00)

Prepared by:
EKI Environment & Water, Inc.
2001 Junipero Serra Boulevard, Suite 300
Daly City, California 94014
(650) 292-9100

2020 Water Demand Analysis and
Water Conservation Measure Update
Marin Municipal Water District

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2020 Water Demand Analysis and
Water Conservation Measure Update
Marin Municipal Water District

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TABLES

2020 Water Demand Analysis and
Water Conservation Measure Update
Marin Municipal Water District

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ABBREVIATIONS AND ACRONYMS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
AFY	acre-feet per year
Ag.	agricultural
AMI	advanced metering infrastructure
AWE	Alliance for Water Efficiency
CA	California
CEQA	California Environmental Quality Act
CII	commercial, industrial, and institutional
CWC	California Water Code
DMM	demand management measure
DOF	Department of Finance
DRA	drought risk assessment
DSS	Decision Support System
d.u.	dwelling unit
DWR	Department of Water Resources
GPCD	gallons per capita day
GPD	gallons per day
gpf	gallons per flush
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet
Irr.	irrigation
MF	multi-family
MFR	multi-family residential
MMWD	Marin Municipal Water District
psi	pounds per square inch
QWEL	Qualified Water Efficient Landscaper
SB	Senate Bill
SFR	single family residential
SMSWP	Sonoma-Marin Saving Water Partnership
Sonoma Water	Sonoma County Water Agency
sq ft	square feet
SWRCB	State Water Resources Control Board
ULFT	ultra low flow toilet
UWMP	Urban Water Management Plan
WBIC	Weather Based Irrigation Controller
WSA	Water Supply Assessment
WSCP	Water Shortage Contingency Plan

1. INTRODUCTION

In preparation for development of their 2020 Urban Water Management Plan (UWMP) updates, nine members of the Sonoma-Marin Saving Water Partnership (SMSWP or Water Contractors) coordinated to conduct a joint update of their water demand projections and water conservation planning efforts (i.e., the *2020 Water Demand and Conservation Project*). The participating SMSWP members include: City of Cotati, City of Petaluma, City of Rohnert Park, City of Santa Rosa, City of Sonoma, Marin Municipal Water District, North Marin Water District, Town of Windsor, and Valley of the Moon Water District. These nine Water Contractors are shown on **Figure 1-1**.

The goals of the *2020 Water Demand and Conservation Project* were to apply a common methodology to conduct the following analysis for each Water Contractor:

- Evaluate and document recent historical water use characteristics and trends, including population and account growth;
- Estimate projected water demands for the years 2025 through 2045 to support both the 2020 UWMP update and coordination and planning efforts with Sonoma County Water Agency (Sonoma Water);
- Update the suite of common regional conservation measures that are being considered for implementation in the future;
- Review and document past participation in water conservation programs; and
- Estimate the potential water savings associated with future water conservation program implementation.

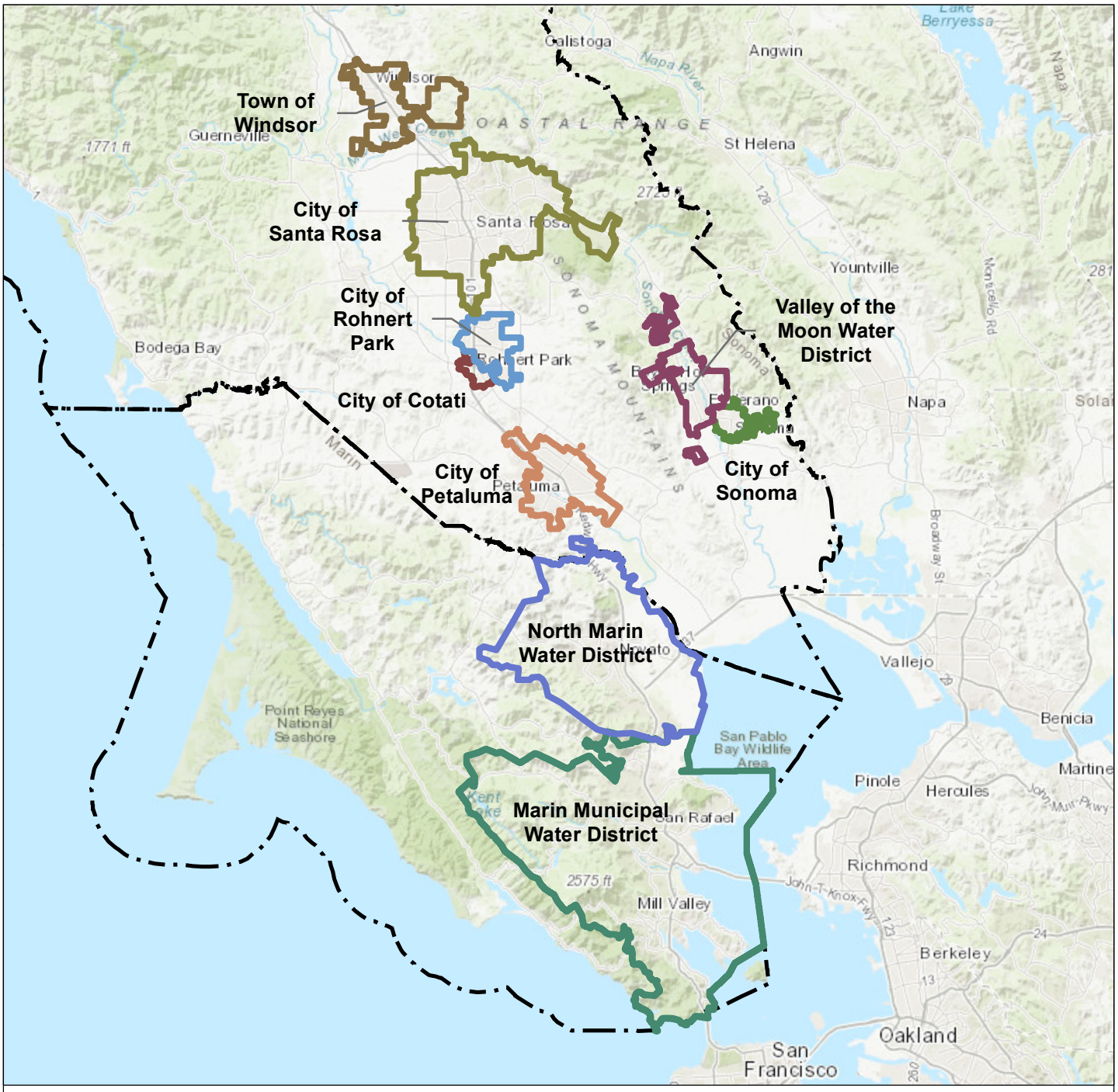
This 2020 Water Demand and Conservation report presents the results for the Marin Municipal Water District (District), which is located in Marin County and serves a population of approximately 192,138 people (**Figure 1-2**). The District's water supplies include surface water purchased from the Sonoma County Water Agency (Sonoma Water), surface water collected from the Mt. Tamalpais watershed, and recycled water produced by the Las Gallinas Sanitary District. Potable water is supplied to District customers, and recycled water is provided to a variety of uses in the Terra Linda area of San Rafael including for irrigation, cooling towers, car washes and toilet flushing. Over the years, the District has worked to increase water efficiency (conservation) in response to both the SB X7-7 UWMP requirements and as part of the regional SMSWP. Demand reductions have been achieved through the implementation of the plumbing code and water conservation programs, including some administered by the District and some administered through the regional SMSWP.

This 2020 Water Demand and Conservation report is organized as follows:

- **Section 1** identifies the goals and objectives of this report;
- **Section 2** provides the regulatory context for the demand projections described in this report as well as new requirements related to UWMPs and long-term demand planning that agencies will need to consider in development of their 2020 UWMPs;
- **Section 3** describes historical water use patterns and characteristics within the District;

- **Section 4** describes the projected water demands through 2045, including the assumptions and methodology used;
- **Section 5** documents past participation in conservation programs and estimated savings associated with program implementation, and presents the results of a detailed analysis of program participation trends for five select conservation programs;
- **Section 6** documents the water conservation measure screening process, identifies individual programs and program scenarios for potential future implementation by the District, and presents the results of a benefit-cost analysis and an estimate of the potential water savings associated with these conservation programs;
- **Section 7** provides conclusions regarding the main findings of the report; and
- **Section 8** provides key references and sources.

Small tables are provided within text throughout the document. Figures and large tables and charts are provided at the end of each section.



Legend

- County Boundary
- City of Cotati
- City of Petaluma
- City of Rohnert Park
- City of Santa Rosa
- City of Sonoma
- Marin Municipal Water District
- North Marin Water District
- Town of Windsor
- Valley of the Moon Water District

Notes

1. All locations are approximate.

Sources

1. Service area boundary provided by respective agencies.
2. Basemap provided by ESRI.

N

0 8 16

Miles

Participating Sonoma-Marin Saving Water Partnership Members

Marin Municipal Water District
December 2020
C00004.00

Figure 1-1

eki environment & water

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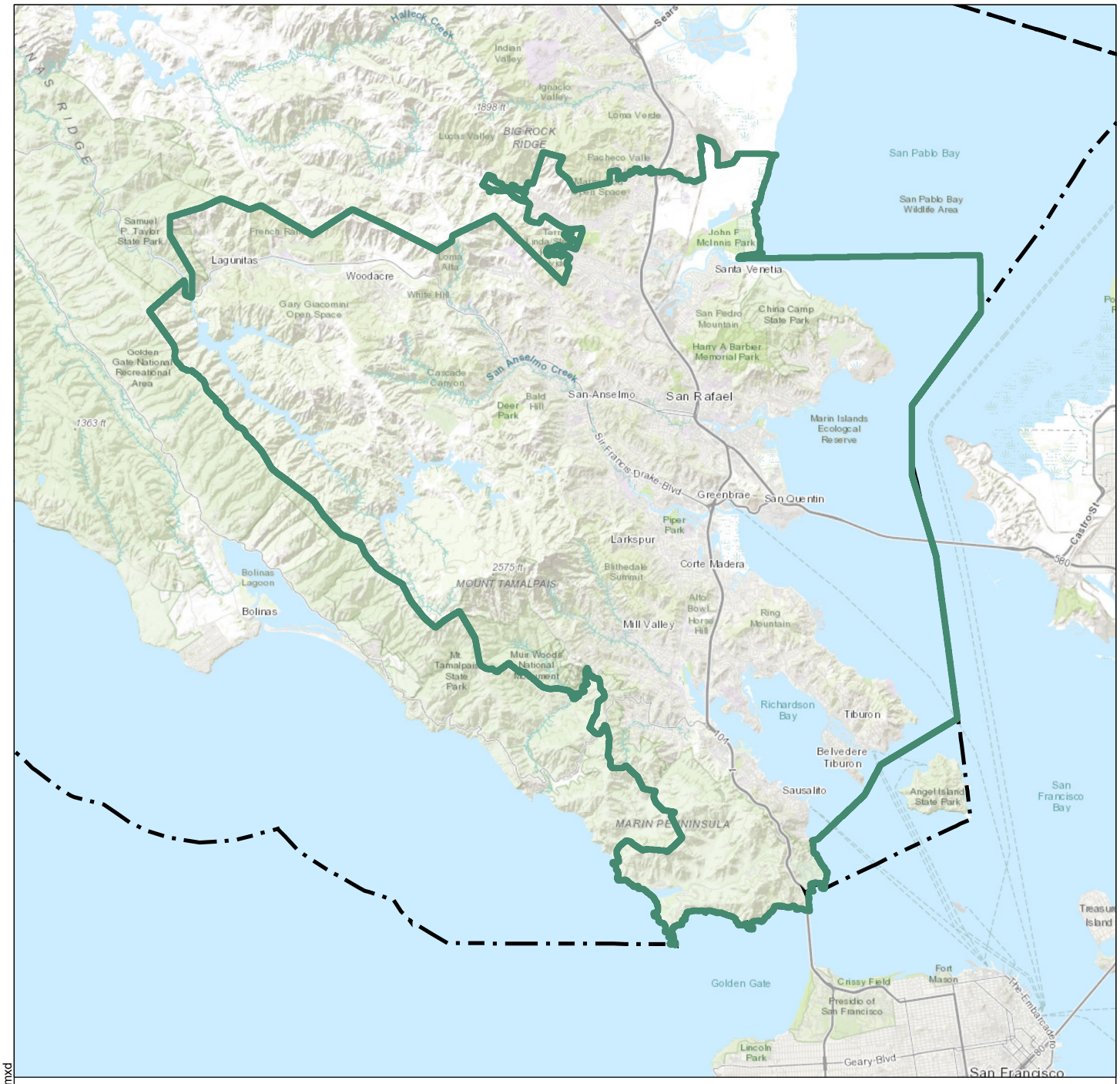

Legend

- County Boundary
- Marin Municipal Water District

N

0 3 6

Miles

Marin Municipal Water District Service Area

Notes

1. All locations are approximate.

Sources

1. Service area boundary provided by Marin Municipal Water District.
2. Basemap provided by ESRI.

eki environment & water

Marin Municipal Water District
December 2020
C00004.00

Figure 1-2

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2. REGULATORY CONTEXT

This section provides the regulatory background for the requirements to project future demand in the 2020 UWMP. In addition, it outlines requirements for elements of the District's 2020 UWMP that are beyond the scope of the *2020 Water Demand and Conservation Project,* such as consideration of supply reliability, water shortage contingency planning, and the annual urban water use objectives retailers will be required to report on in 2023 and meet by 2027.

2.1. 2020 UWMP Demand Projections Requirements

California Water Code (CWC) § 10631, excerpted below, describes the requirements to develop water demand projections that consider water use by customer sector, incorporate distribution system water loss, and account for anticipated water savings. As described further in Section 4, water demand projections were developed for the District using a land-use based approach that is consistent with these requirements and previous UWMP demand projection methodologies, and can be incorporated into the District's 2020 UWMP.

CWC § 10631

A plan shall be adopted in accordance with this chapter that shall do all of the following:

…

(d) (1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

…

(d)(4) (A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.
(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

2.2. New Requirements for 2020 UWMPs and Future Demand Planning

Through the recent *Making Water Conservation a California Way of Life* (Assembly Bill [AB]-1668/Senate Bill [SB]-606) and other legislation, the State has made numerous changes to the requirements for UWMPs and related water conservation planning efforts. In many cases, the updated regulations reference details and methodologies to be developed by the California Department of Water Resources (DWR), and/or are somewhat vague and will benefit from the development of guidelines/further clarification by DWR. DWR is currently developing an updated guidebook to support the development of the 2020 UWMPs, which is expected to be complete by late 2020. This new guidebook is anticipated to provide direction to retailers with respect to many elements of the new legislation.

A summary of key changes to various elements of 2020 UWMP and related planning efforts is provided below. Copies of the revisions to relevant sections of the California Water Code per AB-1668, SB-606, and SB-664 are provided in **Appendix A.**

2.2.1. Annual Urban Water Use Objectives

Beginning in 2023,[1] retailers will be required to report on "annual water use objectives" by November 1 of each year, per CWC § 10609. The specific standards that will be used to determine an retailer's annual urban water use objectives are currently under development and are the source of a great deal of uncertainty with respect to the long-term water conservation and demand planning as part of the 2020 UWMP. Although the 2020 UWMP will not identify or calculate these new annual urban water use objectives, the new standards will become effective within the UWMP planning horizon. Per CWC § 10609.25, retailers will be required to "provide a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027." Details regarding the annual urban water use objectives and other requirements are expected to evolve significantly over the next two years.

- **Residential outdoor water use:** Per CWC § 10609.6, DWR and California State Water Resources Control Board (SWRCB) "shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor residential use" which "incorporate the principles of the model water efficient landscape" and "apply to irrigable lands." DWR is currently working with a contractor to measure all of the single- and multi-family landscape (irrigable) area within urban water suppliers' service areas across the state based on aerial imagery. The result of these measurements will become the basis for each retailer's residential landscape water use component of the annual water use objectives. In order to accurately calculate and compare

[1] DWR acknowledged publicly on 5 December 2019 that this and other related deadlines are likely to slip. DWR indicated that compliance with these objectives will most likely begin in 2024.

against this metric, retailers will be responsible for identifying dedicated irrigation accounts (water connections) associated with residential water use (including multi-family residential) and dedicated irrigation accounts associated with commercial, industrial and irrigation (CII) use. The landscape area measurement process is being developed through a stakeholder workgroup process with periodic public meetings.

- **Residential indoor water use:** Per CWC § 10609.4.(a), "(1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily. (2) Beginning January 1, 2025, and until January 1, 2030, the standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard recommended pursuant to subdivision (b). (3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b)." While the legislation appears to be clear on the method to calculate the indoor residential water use component, the SWRCB has begun the California Environmental Quality Act (CEQA) process for the new water use objective requirements and has expressed concern that using the 55 gallons per capita per day (GPCD) number in the legislation will constitute "backsliding" and thus will need to be ratcheted down.

- **Water loss:** Per CWC § 10608.34.(i), "No earlier than January 1, 2019, and no later than July 1, 2020, the board shall adopt rules requiring urban retail water suppliers to meet performance standards for the volume of water losses. In adopting these rules, the board shall employ full life-cycle cost accounting to evaluate the costs of meeting the performance standards. The board may consider establishing a minimum allowable water loss threshold that, if reached and maintained by an urban water supplier, would exempt the urban water supplier from further water loss reduction requirements." The SWRCB is developing a complicated cost-benefit analysis methodology that would need to be conducted by retailers in order to determine what water loss controls are deemed cost-effective and thus required to be implemented. Water retailers and the California Municipal Utilities Association are advocating for an alternative methodology. The implementation of these requirements has been delayed beyond the 1 July 2020 deadline.

- **CII:** Rather than developing a water volume-based standard for the CII sector, DWR was tasked with developing a set of performance standards through a workgroup process to increase water efficiency, per CWC § 10609.10, with adoption of these performance measures by 30 June 2022. Based on this process, DWR has determined that it is impossible to set such standards today, but retailers will be required to report on progress towards key actions related to potential future standards, such as conversion of mixed CII meters to dedicated irrigation meters, performance of water audits for CII accounts, development of water management plans for CII accounts, detailed classification of CII accounts by industry, etc. The specific actions that retailers will be required to report are not yet known.

- **Recycled Water Use:** In previous UWMPs, calculations of SB X7-7 baselines, targets, and gross water use for compliance were based only on potable water use, and thus the use of recycled water to offset potable water use was an effective method to help retailers conserve potable water and meet their SB X7-7 targets. However, under CWC § 10609.(b)(2)(F), the benefit of recycled water for compliance with annual water use objectives is much more limited: "Provides a bonus incentive for the amount of potable recycled water used the previous year when comparing the previous year's water use with the urban water use objective, of up to 10 percent of the urban water use objective." Thus, adoption and expansion of recycled water use only provides a compliance benefit if it constitutes direct potable reuse, indirect potable reuse, or reservoir

augmentation (CWC § 10608.12.(o)).

2.2.2. Supply Reliability

- Retailers will be required to develop procedures to conduct annual water supply and demand assessments to determine its water supply reliability for the current year and one dry year and to conduct these assessments annually beginning in 2022 (CWC § 10632(a)(2)). These procedures are required to include the following (emphasis added):

  (A) The **written decision making process** that an urban water supplier will use each year to determine its water supply reliability.
  (B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

  (i) Current year unconstrained demand, **considering weather, growth, and other influencing factors,** such as policies to manage current supplies to meet demand objectives in future years, as applicable.

  (ii) Current year available supply, considering **hydrological and regulatory conditions in the current year and one dry year.** The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

  (iii) Existing infrastructure capabilities and plausible constraints.

  (iv) **A defined set of locally applicable evaluation criteria** that are consistently relied upon for each annual water supply and demand assessment.

  (v) A description and **quantification of each source** of water supply.

- In addition, the requirement to analyze supply reliability for a period of multiple consecutive drought years has been extended from a 3-year period to a 5-year period, per CWC §10631(f) and §10635(a). Specifically, retailers are now required to "compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years."

2.2.3. Water Shortage Contingency Plans

The new regulations also add new requirements related to drought planning and Water Shortage Contingency Plans (WSCPs):

- Retailers will now be required to conduct a drought risk assessment (DRA) as part of their UWMPs to assess water supply reliability (or vulnerability) for a period of drought lasting **five consecutive water years** (defined by CWC § 10612 as "the driest five-year historical sequence for the agency's water supply"),[2] starting from the year following that of the UWMP, and to compare water supplies (assessing each source of supply separately) with total projected water use (CWC § 10635(b))

[2] While the corresponding Water Supply Assessment (WSA) regulations have not been updated to require analysis of a five-year period, retailers should consider including a five-year drought period in their supply reliability assessment in any new WSAs.

during that period. The DRA five-year period for this 2020 UWMP is 2021-2025. During the 10 March 2020 workshop, DWR indicated that retailers will be expected to identify supply and demand on a monthly basis for this purpose, although it is noted that this does not appear to be an explicit requirement of the regulations.

- Per CWC § 10632.5 retailers' WSCPs "shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities" and a water supplier may submit "a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk."
- WSCPs will be required to use "Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage," or to provide a "cross-reference relating its existing categories to the six standard water shortage levels."

3. WATER USE CHARACTERISTICS

This section describes historical water use by customers within the District, including changes in use observed during and after the historic 2014 - 2016 drought, changes in average per account water use over time, and estimates of indoor and outdoor water use, based on data provided by the District. This information is used to provide context and background to support the projections of future demands (Section 4) and estimates of potential conservation program benefits (Section 6).

3.1. Historical Total and Per Capita Water Use

Table 3-1 summarizes the District's historical water use, service area population, and per capita water use for the years 2010 through 2019 (Marin Municipal Water District, 2020). Water use is described both in terms of total water produced and average per capita water use. It should be noted that the per capita water use for purposes of comparing water use to SB X7-7 water conservation targets may be different, due to the prescriptive methodology DWR has established for determining an agencies compliance population and total water use[3]. SB X7-7 compliance will need to be separately addressed by the District's 2020 UWMP.

Total water use, including potable, raw, and recycled water,[4] ranged from 23,680 acre-feet per year (AFY) to 29,847 AFY over this period. Total per capita water use (i.e., including potable, raw, and recycled water use) ranged from 110 GPCD to 142 GPCD.

Both the total and per capita water use declined from 2013 through 2015, likely influenced by the historic drought conditions, mandatory state-wide restrictions in urban water use imposed by the SWRCB, and local drought response. Total and per capita water use has remained lower than pre-drought conditions, with an increase from 2016 through 2019, indicating a degree of rebound following the drought.

Historical water use by customer sector is provided in **Table 3-2**. The single family residential (SFR) sector comprises the largest proportion of the District's total water use (i.e., 53% in 2019). By comparison, in 2019, multi-family residential (MFR) accounts comprised 12% of total water use; business/industrial accounts comprised 10% of total water use; the combined agricultural/irrigation, raw water, and recycled water accounts comprised 8.5% of total water use; and institutional accounts comprised 5.4% of total water use. In 2019, non-revenue water was estimated to be 11% of potable water demand.

3.2. Historical Average Water Use Per Account

The total number of accounts varies over time due to growth and development within the District and shifts in land use.

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[3] In previous years, DWR has preferred that the DWR population tool be used for purposes of estimating service area population for purposes of SB X7-7 compliance, so that a uniform method is applied across retailers. The updated 2020 DWR population tool has not yet been released. The population reported by this tool may therefore be somewhat different than the population estimates used herein.

[4] Water use data is per District-provided billing data. The recycled water system is supplemented with potable water to meet demands, as necessary. Recycled water use discussed herein reflects all water served through the recycled water system.

The total number of accounts by customer sector for the 2010 to 2019 period is shown in **Table 3-3**, including a pie chart illustrating the relative proportion of accounts (Marin Municipal Water District, 2020). The SFR sector comprised the highest proportion of accounts in 2019 (85%), followed by the MFR sector (6.3%), business/industrial sector (5.3%), agricultural/irrigation sector (1.4%), recycled water sector (0.49%), and institutional sector (0.38%). From 2010 to 2019, most sectors experienced between 0.5% and 0.9% total growth. However, business/industrial accounts decreased by 0.61% over the same time period, while agricultural/irrigation accounts increased by 2.4%.

Average water use per account is presented in **Table 3-4a**. For most sectors, per account water usage has followed the same general trends over time as total water use in the District (per **Table 3-1**).

Table 3-4b presents average water use for the residential sectors normalized by number of dwelling units. SFR accounts, on average, use approximately 100% to 130% more water per dwelling unit than MFR accounts. It should be noted that many larger MFR developments have dedicated irrigation meters.

3.3. Change in Residential Water Use Pre- and Post-Drought

Over time, customer water use becomes more efficient due to participation in conservation programs, passive savings,[5] and other behavioral or cultural changes. The more efficient customers become, the less opportunity there is for customers to save more water, which is referred to as "demand hardening." The SFR sector comprises the largest proportion of the District's total water use (approximately 53% in 2019). Therefore, in order to observe demand hardening over time, histograms illustrating the distribution of water use by SFR customers for three separate years (2010, 2013, and 2019) are shown in **Figure 3-1.**

The median SFR account water use has shifted from 207 GPD to 227 GPD between 2010 and 2013, reflecting a 9.7% increase in median water use. Following the drought, water use was reduced to a median of 193 GPD in 2019, reflecting a 17% reduction from 2013 water use. In 2010, the middle 50% of accounts used 131 GPD to 307 GPD. In 2019, this range has slightly broadened, with the middle 50% of accounts using between 117 GPD and 301 GPD. Based on this (and taken with the **Table 3-5** results discussed below), it appears that customers are continuing to increase their efficiency, which is expected to be a combination of both passive and active savings, as well as effects of the drought. Water savings achieved during drought conditions are typically driven by behavioral changes, rather than device changeouts (AWE, 2015). Given the limited rebound observed since the drought (**Table 3-4a**), it may be that behavioral changes during the drought have resulted in permanent changes in customers' water use.

3.4. Residential Water Use by Dwelling Unit and Age of Construction

It is commonly assumed that new residential construction is inherently more water efficient than older construction due to changes in plumbing codes and the increased efficiency of water using devices available on the market today. However, in some areas it has been observed that newer construction can actually have higher rates of water use, which is an important consideration when evaluating future water

[5] Passive savings refers to the water savings associated with the natural replacement of older toilets, showerheads, clothes washers, and other water using appliances with newer high efficiency devices that are available due to both market shifts and increasing efficiency mandated by the building code, plumbing code, and other regulatory requirements.

demands associated with new development. In order to evaluate water use relative to the age of residential construction within the District, water use by SFR and MFR accounts is summarized in **Table 3-5** by units constructed: (1) prior to 1994, (2) from 1994 through 2009, and (3) 2010 and later.

Water use by SFR units constructed from 1994-2009 had on average 18% higher water use than units constructed 2010 and later and 43% higher water use than units constructed prior to 1994. Water use for buildings constructed 2010 and later had on average 22% higher water use than pre-1994 construction. Given this, as discussed in Section 4.3.1, a water demand factor representative of newer construction (1994 and later) is used as the basis for demand projections for new SFR accounts.

MFR units appear generally more consistent across construction age than SFR units. Newer construction (2010 and later) shows a larger range in water use across the time period but is likely driven by the relatively low number of accounts in that age group. Given this general consistency, the demand projections for new MFR accounts discussed in Section 4.3.1 are based on all MFR units regardless of construction age.

3.5. Estimated Indoor and Outdoor Water Use

When designing and estimating the benefits of potential water conservation programs, it is important to understand the relative proportion of water use that is used indoors versus outdoors.

As shown in the first chart in **Table 3-6**, potable water use within the District varies seasonally, and water use in the summer is two to three times greater than water use during the winter. This seasonality is typically driven by increased irrigation needs in the summer, as compared to the more limited irrigation water use during the wetter and cooler winter months. The second chart in **Table 3-6** shows the seasonality of recycled water use, which is used primarily for irrigation.[6] Based on the recycled water use patterns, irrigation rates appear to be nearly zero during winter months, confirming that it is reasonable and conservative to assume that minimal irrigation with potable water occurs during winter months. This is a high-level estimate of indoor and outdoor water use, which errs on the side of estimating higher indoor water use.

Given the water use patterns presented in **Table 3-6**, the minimum average daily water use during winter months (November – April due to bi-monthly billing data) was used to estimate the indoor water use for all non-irrigation customer sectors. The results of this estimate are shown in **Table 3-7**. Approximately 64% of all potable water use (excluding potable water served through the recycled water system) within the District is estimated to be indoor use, and 36% to be outdoor water use. For SFR users (i.e., the largest water using sector within the District), approximately 59% of water use is estimated to be indoor, and 41% outdoor water use. Total water use (including recycled and raw water) is approximately 61% indoor water use and 39% outdoor use.

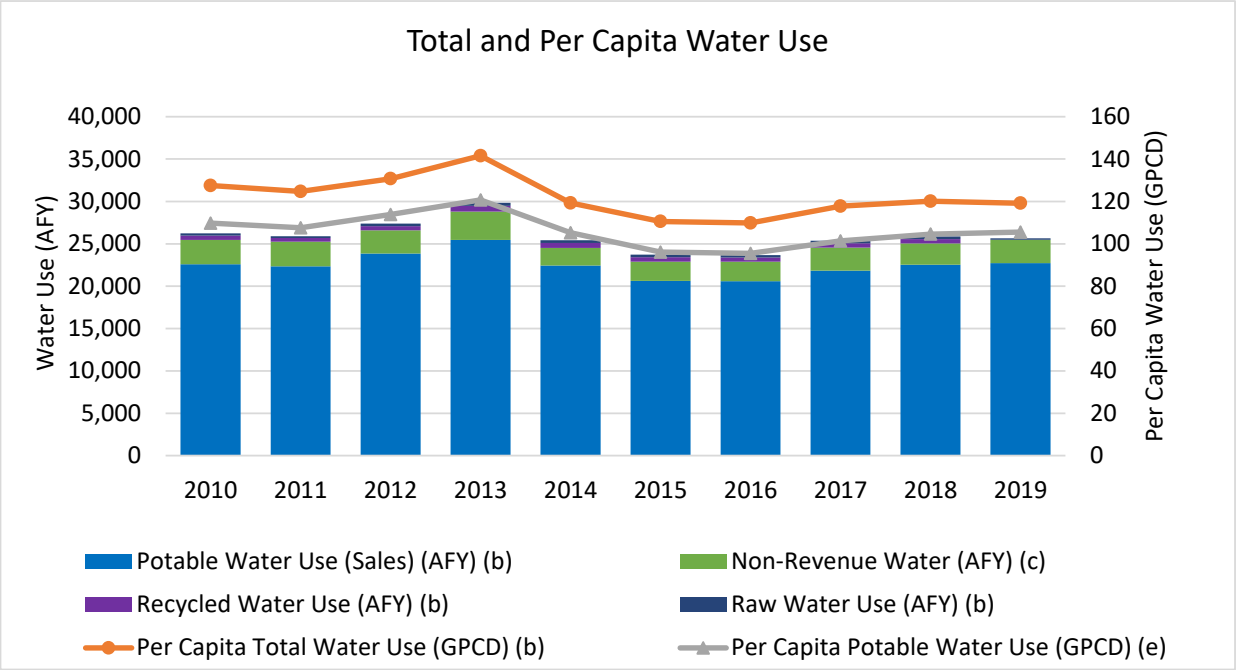
Aside from the "other," raw water, irrigation, and recycled water sectors (presumed 100% outdoor water use), the SFR sector is estimated to have the highest proportion of outdoor water use at 41%, followed by business/industrial at 17%, institutional at 17%, and MFR at 10%. It should be noted that landscape areas

[6] Recycled water is also used for toilet flushing, car washes, cooling towers, and commercial laundry facilities and averages about 100,000 gallons per day of demand during winter months.

for larger multi-family developments tend to have dedicated irrigation accounts. Further, some industries within the CII sector, such as restaurants and manufacturing, may also experience some degree of seasonality in indoor use, with increased business and production during summer months. Thus, these should be considered high-level estimates of indoor and outdoor use proportions.

Table 3-1
Water Use and Population
Marin Municipal Water District

Year (a)	Potable Water Use (Sales) (AFY) (b)	Recycled Water Use (AFY) (b)	Raw Water Use (AFY) (b)	Non-Revenue Water (AFY) (c)	Total Water Use (AFY)	Service Area Population (d)	Per Capita Potable Water Use (GPCD) (e)	Per Capita Total Water Use (GPCD) (e)
2010	22,597	514	258	2,872	26,241	183,716	110	128
2011	22,340	432	220	2,916	25,908	185,389	108	125
2012	23,864	507	301	2,728	27,400	187,089	114	131
2013	25,458	684	351	3,354	29,847	188,218	121	142
2014	22,435	579	323	2,088	25,425	190,267	105	119
2015	20,624	520	304	2,279	23,727	191,575	96	111
2016	20,584	491	301	2,304	23,680	192,402	96	110
2017	21,847	512	310	2,708	25,377	192,328	101	118
2018	22,533	522	309	2,511	25,875	192,277	105	120
2019	22,723	0	164	2,765	25,652	192,138	106	119



Abbreviations:
AFY = acre-feet per year
DOF = Department of Finance
GPCD = gallons per capita per day

Notes:
(a) Data are presented on a calendar year basis.
(b) Water use data based on customer sales, per Reference 2. The recycled water system is supplemented with potable water to meet demands, as necessary. Recycled water use shown here reflects all water served through the recycled water system.
(c) Estimated non-revenue water (potable) per Table 3-2.

Table 3-1
Water Use and Population
Marin Municipal Water District

(d) Population estimates are adjusted from DOF county estimates using a conversion factor provided by the district, per Reference 3. 2016-2019 estimates were updated using 2020 DOF population estimates, per Reference 1.
(e) Per capita water use is calculated by dividing the annual water use by service area population and the number of days in a year.

References:

1. DOF, 2020. California Department of Finance - Demographic Research Unit, Population Estimates for Cities, Counties, and the State, 2011-2020, with 2010 Benchmark, Report E-4, released on 1 May 2020.
2. Marin Municipal Water District, 2020a. 2010-2019 Urban Water Management Plan Water Use Data, provided by Marin Municipal Water District on 9 July 2020.
3. Marin Municipal Water District, 2020b. MMWD Population 2019 Demand Analysis.xls, provided by Marin Municipal Water District on 9 April 2020.

Table 3-2
Water Use by Customer Sector
Marin Municipal Water District

Water Use Sector	Water Use (AFY) (a) (b)									
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Single Family Residential (c)	13,747	13,482	14,672	15,525	13,824	12,403	12,419	13,337	13,886	13,579
Multi-Family Residential (d)	3,185	3,244	3,329	3,367	3,128	2,984	2,946	3,004	3,065	3,063
Business/Industrial	2,716	2,651	2,788	2,867	2,655	2,577	2,583	2,628	2,671	2,634
Institutional	1,639	1,571	1,467	1,523	1,406	1,311	1,295	1,374	1,365	1,386
Agricultural/Irrigation	1,185	1,179	1,391	1,612	1,330	1,230	1,248	1,369	1,417	1,348
Other (e)	40	32	45	44	36	34	28	35	38	50
Raw Water	258	220	301	351	323	304	301	310	309	164
Recycled Water System (f)										
Potable Water	86	181	171	81	56	85	65	101	91	661
Recycled Water	514	432	507	684	579	520	491	512	522	0
Non-revenue Water (Potable) (g)	11%	11%	10%	11%	8.2%	9.6%	9.7%	11%	9.7%	11%
	2,872	2,916	2,728	3,354	2,088	2,279	2,304	2,708	2,511	2,765
Total Water Use	**26,241**	**25,908**	**27,400**	**29,409**	**25,425**	**23,727**	**23,680**	**25,377**	**25,875**	**25,652**
Total Potable Water Use	**25,469**	**25,256**	**26,592**	**28,374**	**24,523**	**22,903**	**22,888**	**24,555**	**25,044**	**25,488**

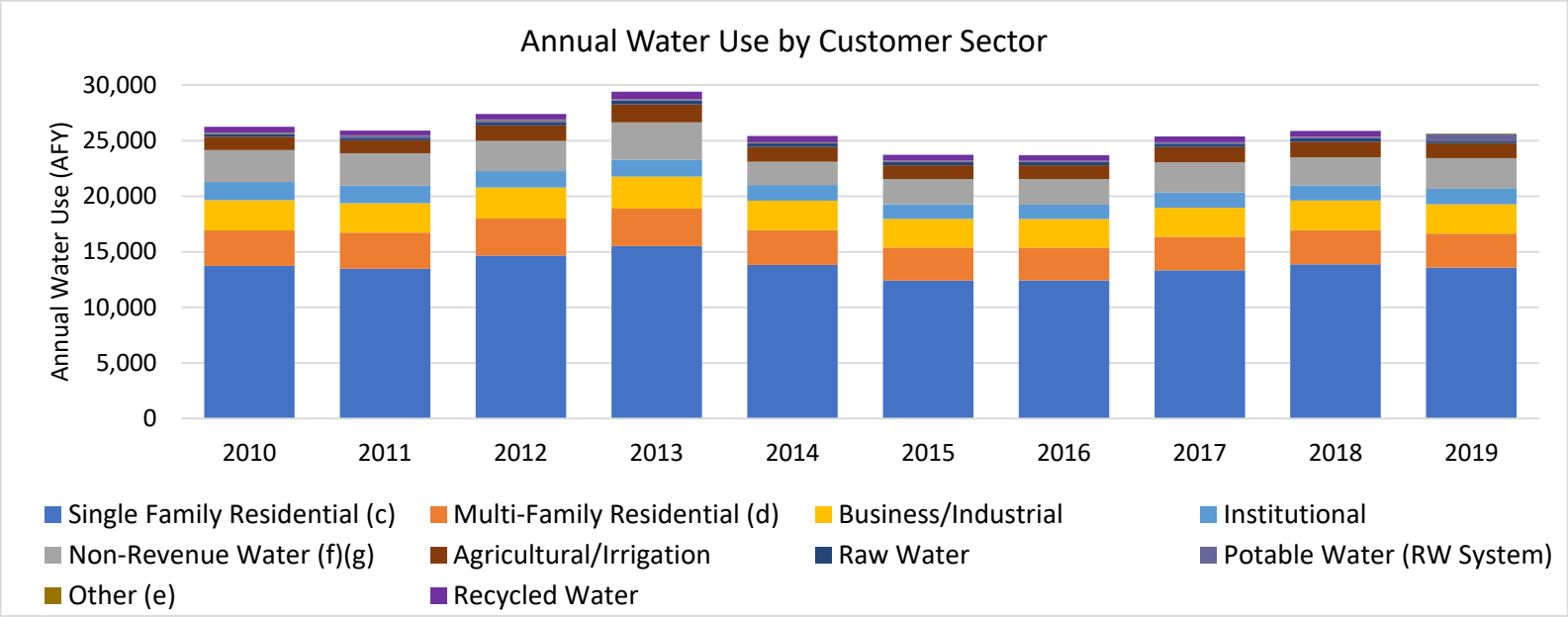


Table 3-2
Water Use by Customer Sector
Marin Municipal Water District

Abbreviations:
AFY = acre-feet per year

Notes:
(a) Data are presented on a calendar year basis.
(b) Water use by sector per Reference 1.
(c) Single-family residential water use includes dedicated single-family irrigation accounts.
(d) Multi-family residential includes duplexes and 3-10+ unit apartments.
(e) "Other" includes fireline and hydrant sectors.
(f) The recycled water system is supplemented with potable water to meet demands, as necessary. The recycled water plant was non-operational in 2019 to allow for infrastructure upgrades.
(g) Non-revenue water was calculated by subtracting total potable water use (including recycled water system makeup water) from total potable water production,

References:
1. Marin Municipal Water District, 2020a. 2010-2019 Urban Water Management Plan Water Use Data, provided by Marin Municipal Water District on 9 July 2020.
2. Marin Municipal Water District, 2020b. Production data provided by Marin Municipal Water District via email on 14 September 2020.

Table 3-3
Number of Accounts by Customer Sector
Marin Municipal Water District

Water Use Sector	Number of Accounts (a) (b)									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Single Family Residential (c)	51,241	51,242	51,286	51,327	51,421	51,474	51,511	51,518	51,558	51,593
Multi-Family Residential (d)	3,778	3,771	3,773	3,779	3,788	3,801	3,802	3,798	3,797	3,797
Business/Industrial	3,254	3,246	3,247	3,257	3,249	3,246	3,247	3,245	3,249	3,234
Institutional	225	225	226	227	227	230	228	227	228	227
Agricultural/Irrigation	838	833	825	842	857	850	845	852	853	858
Other (e)	479	472	456	447	466	442	460	491	495	490
Raw Water	2	2	2	2	2	2	2	2	2	1
Recycled Water	300	302	301	303	302	303	302	297	297	294
Total Accounts	**60,117**	**60,093**	**60,116**	**60,184**	**60,312**	**60,348**	**60,397**	**60,430**	**60,479**	**60,494**

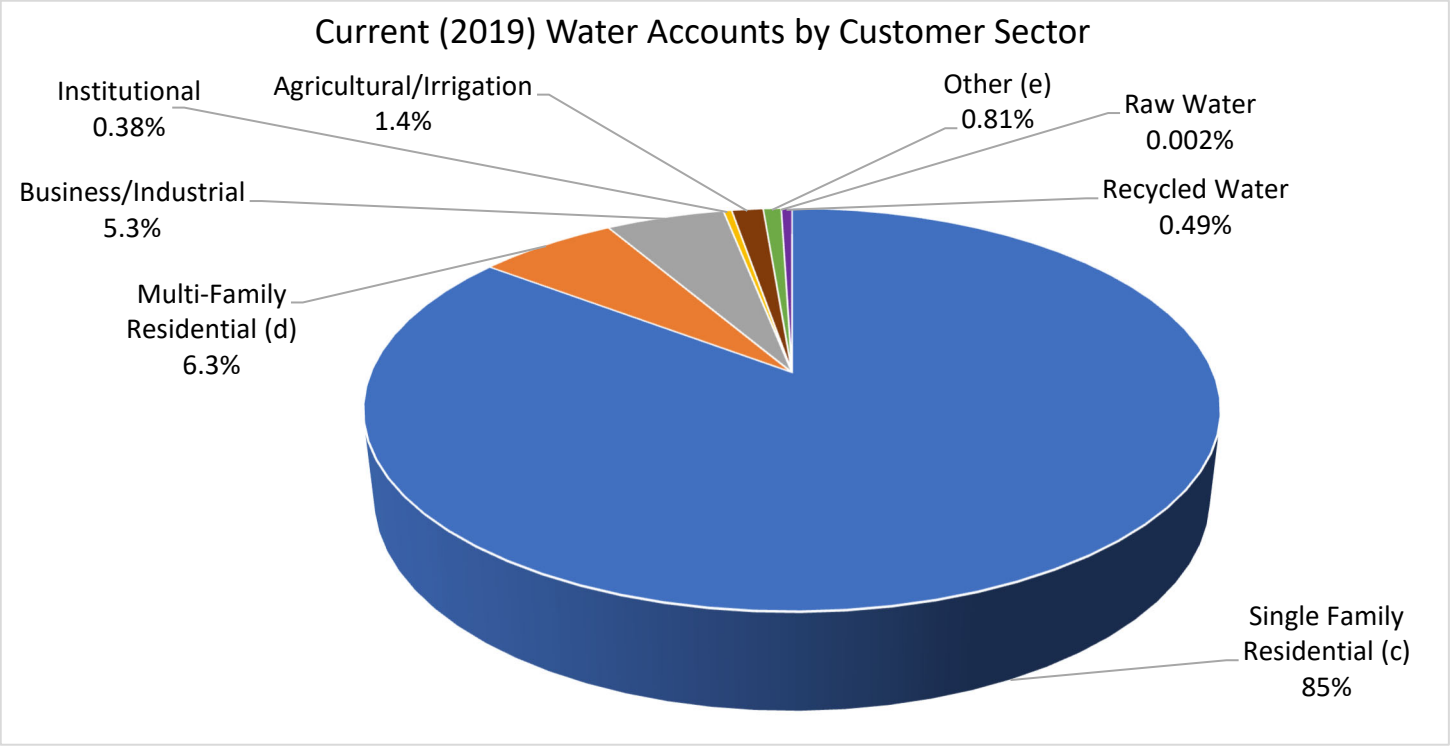


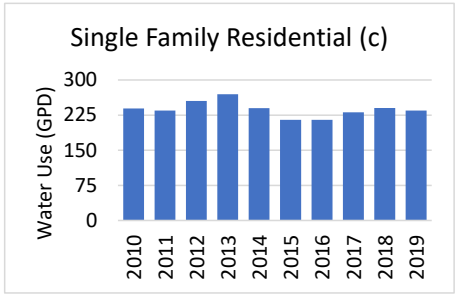
Table 3-3
Number of Accounts by Customer Sector
Marin Municipal Water District

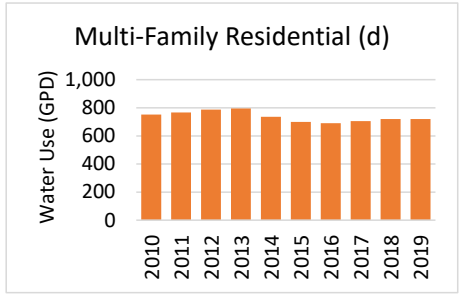
Notes:
(a) Data are presented on a calendar year basis.
(b) Number of accounts by sector per Reference 1. Number of accounts reflects active accounts for each year.
(c) Number of single-family residential accounts does not include dedicated single-family irrigation accounts.
(d) Multi-family residential includes duplexes and 3-10+ unit apartments.
(e) "Other" includes fireline and hydrant sectors.

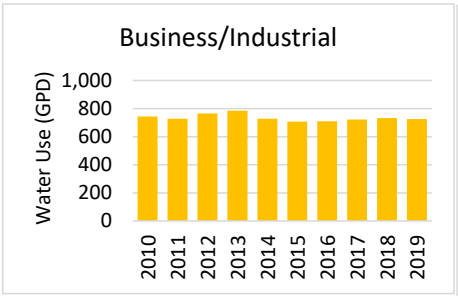
References:
1. Marin Municipal Water District, 2020. 2010-2019 Urban Water Management Plan Water Use Data, provided by Marin Municipal Water District on 9 July 2020.

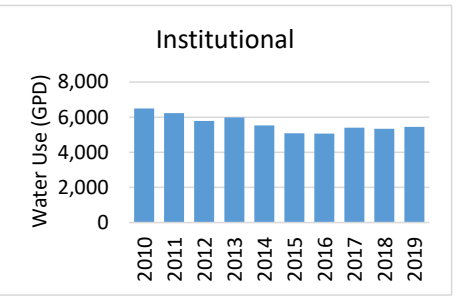
Table 3-4a
Per Account Water Use by Customer Sector
Marin Municipal Water District

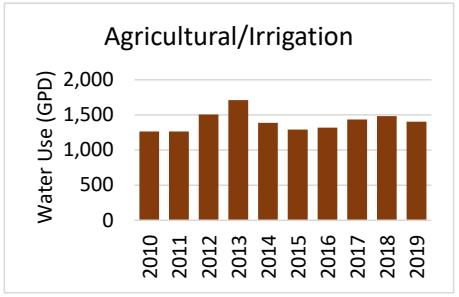
Water Use Sector	Water Use per Account (GPD) (a) (b)									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Single Family Residential (c)	239	235	255	270	240	215	215	231	240	235
Multi-Family Residential (d)	752	767	787	795	737	700	691	706	720	720
Business/Industrial	745	729	766	785	729	708	710	722	734	727
Institutional	6,500	6,228	5,789	5,985	5,527	5,085	5,067	5,399	5,341	5,449
Agricultural/Irrigation	1,261	1,263	1,504	1,708	1,385	1,291	1,317	1,433	1,482	1,402
Other (e)	75	61	89	88	68	69	55	63	68	92
Raw Water	115,184	98,107	134,286	156,569	144,270	135,628	134,245	138,449	137,692	146,440
Recycled Water System (f)	1,784	1,811	2,010	2,252	1,876	1,781	1,642	1,841	1,841	2,006

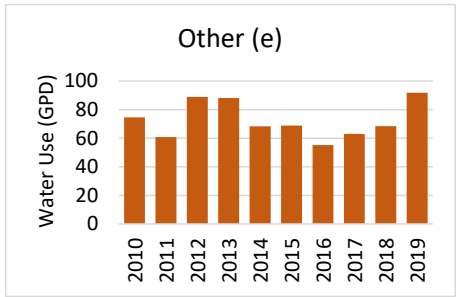


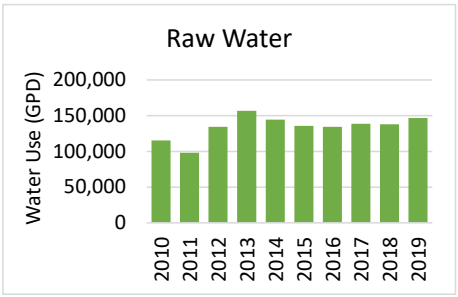


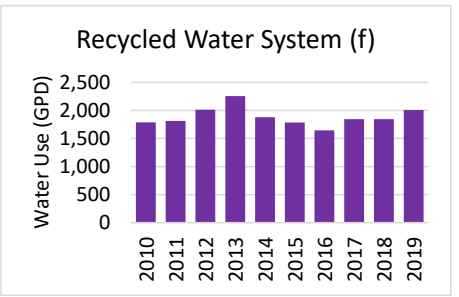










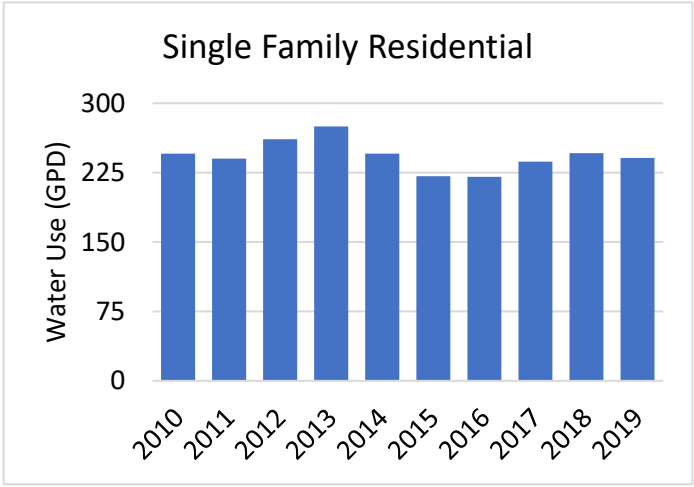


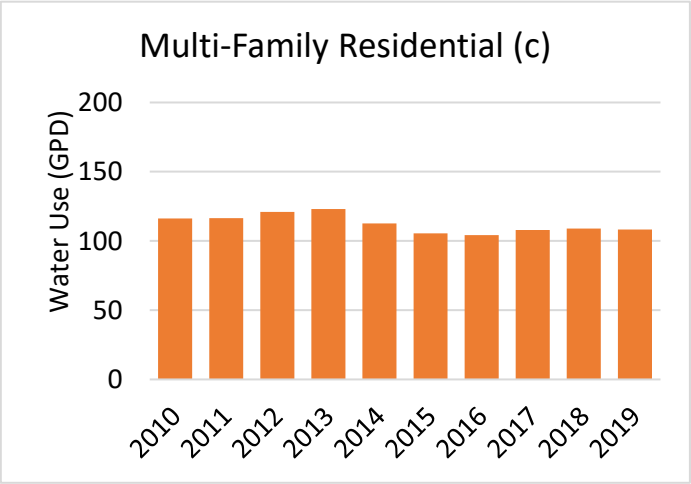
Abbreviations:
GPD = gallons per day

Notes:
(a) Data are presented on a calendar year basis.
(b) Water use and number of accounts by sector per Tables 3-2 and 3-3.
(c) Single-family residential use includes dedicated use by single-family irrigation accounts.
(d) Multi-family residential includes duplexes and 3-10+ unit apartments.
(e) "Other" includes fireline and hydrant sectors.
(f) The recycled water system is supplemented with potable water to meet demands, as necessary. Potable make-up water volume is shown in Table 3-2.

Table 3-4b
Per Dwelling Unit Water Use for Residential Sectors
Marin Municipal Water District

Water Use Sector	Water Use per Dwelling Unit (GPD/DU) (a) (b)									
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Single Family Residential	246	240	261	275	245	221	220	237	246	241
Multi-Family Residential (c)	116	116	121	123	113	105	104	108	109	108



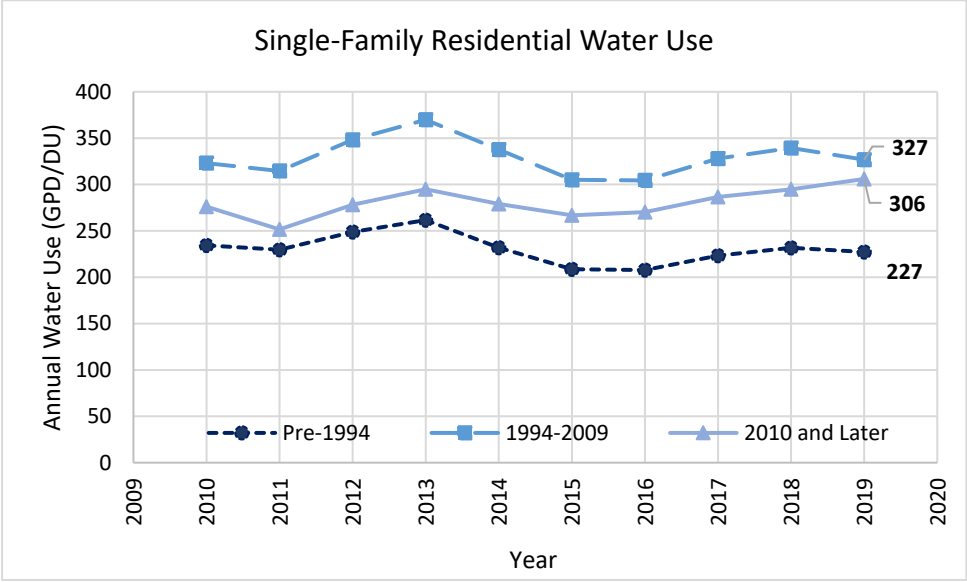


Abbreviations:
DU = dwelling unit
GPD = gallons per day

Notes:
(a) Data are presented on a calendar year basis.
(b) Per dwelling unit water use is calculated based on the number of residential dwelling units per account provided in customer billing data. Data included in this analysis is limited to accounts that received six bills in the specified year.
(c) Multi-family residential includes duplexes and 3-10+ unit apartments.

Table 3-5
Residential Water Use by Age of Construction
Marin Municipal Water District

Construction Age	Average Water Use (GPD per Dwelling Unit) (a) (b)										Number of Accounts, 2019
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
Single Family Residential											
Pre-1994	234	230	249	262	232	208	208	223	232	227	39,003
1994-2009	323	315	348	370	338	305	304	328	339	327	6,776
2010 and Later	276	252	278	295	279	267	270	287	295	306	732
Multi-Family Residential											
Pre-1994	116	117	121	123	112	105	104	107	109	109	2,466
1994-2009	111	110	120	121	115	114	104	121	111	114	209
2010 and Later	132	174	200	185	150	99	81	97	105	115	33



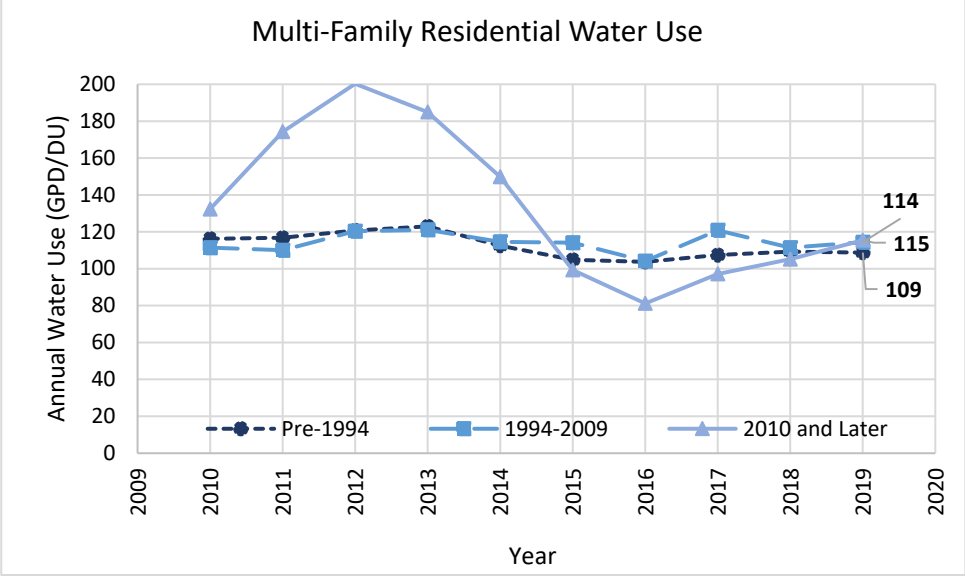


Table 3-5
Residential Water Use by Age of Construction
Marin Municipal Water District

Abbreviations:
-- = not available
DU = dwelling unit
GPD = gallons per day

Notes:
(a) Data are presented on a calendar year basis.
(b) Average water use per dwelling unit is shown for residential sectors based on billing data, per Reference 2. Accounts included in this analysis are limited to that for which construction year is available, based on Marin County Assessor data, and that received 6 bills in the specified year per Reference 1.

References:
1. Marin County, 2020. County Wide Parcel Data ConservationJan2020.gdb, provided by Marin Municipal Water District on 13 February 2020.
2. Marin Municipal Water District, 2020. 2010-2019 Urban Water Management Plan Water Use Data, provided by Marin Municipal Water District on 9 July 2020.

Table 3-6
Monthly Water Use
Marin Municipal Water District

Month	Monthly Water Use (AF) (a)									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Potable Water Use										
January	1,102	1,050	1,197	991	1,316	1,034	989	956	1,079	1,052
February	1,591	1,616	1,829	1,664	1,948	1,630	1,436	1,438	1,684	1,508
March	902	958	1,077	1,064	1,041	1,046	870	867	1,009	859
April	1,602	1,619	1,643	1,926	1,595	1,859	1,474	1,408	1,596	1,440
May	1,207	1,307	1,251	1,609	1,273	1,309	1,177	1,119	1,222	1,219
June	2,246	2,375	2,577	2,889	2,430	2,157	2,262	2,286	2,352	2,211
July	1,898	1,796	2,083	2,146	1,935	1,575	1,836	1,994	1,945	1,804
August	3,162	2,882	3,252	3,127	2,846	2,360	2,797	2,928	2,928	2,862
September	2,246	2,111	2,269	2,175	1,908	1,733	2,029	2,121	2,084	2,152
October	3,058	2,864	2,950	2,991	2,583	2,387	2,530	2,854	2,730	2,878
November	1,633	1,593	1,580	1,908	1,559	1,481	1,404	1,733	1,657	1,809
December	1,790	1,914	1,889	2,361	1,855	1,888	1,646	1,950	2,071	2,186
Recycled Water System Use (b)										
January	--	--	--	--	--	--	--	--	--	--
February	11	10	32	16	40	16	12	11	24	14
March	--	--	--	--	--	--	--	--	--	--
April	19	21	23	66	26	72	30	16	27	14
May	--	--	--	--	--	--	--	--	--	--
June	125	150	156	205	163	132	149	151	160	138
July	--	--	--	--	--	--	--	--	--	--
August	241	202	240	202	209	177	207	225	220	220
September	--	--	--	--	--	--	--	--	--	--
October	194	163	176	192	163	159	157	193	163	192
November	--	--	--	--	--	--	--	--	--	--
December	17	43	25	73	46	48	22	49	62	82

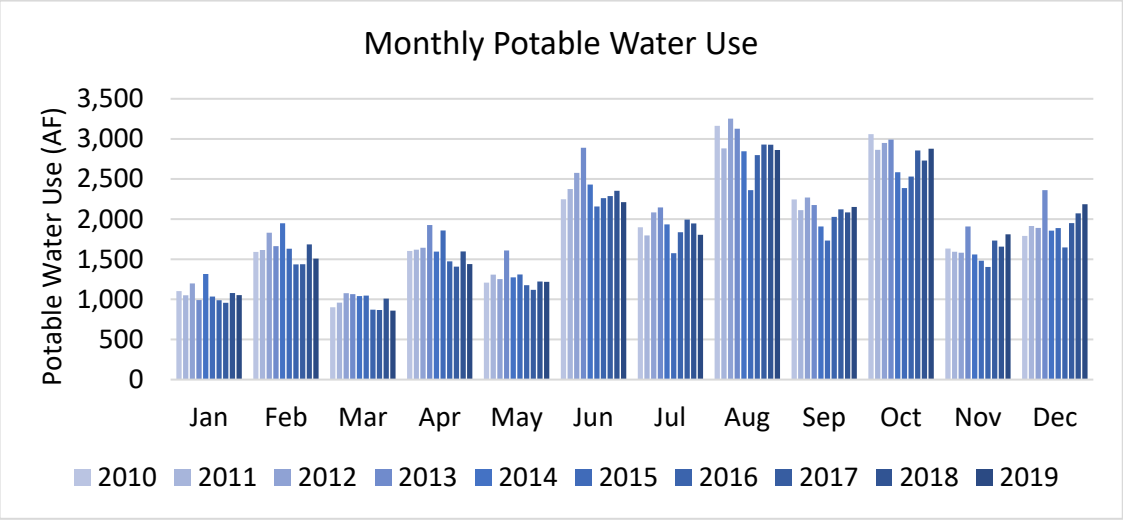
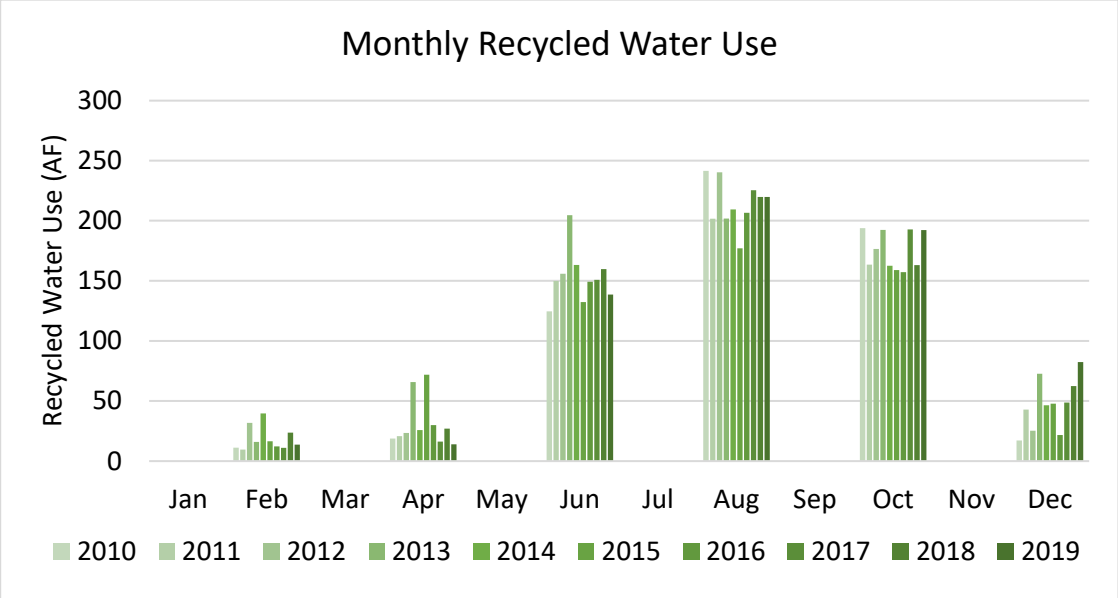


Table 3-6
Monthly Water Use
Marin Municipal Water District



Abbreviations:

-- = not available
AF = acre-feet
MMWD = Marin Municipal Water District

Notes:

(a) Monthly potable and recycled water use per Reference 1. Customers are billed on a bi-monthly basis, and data are presented based on billing cycle. Due to a limitation of the MMWD billing data system, monthly water use data shown is between approximately 0.3% and 0.4% less than the actual total water use shown in Table 3-2.

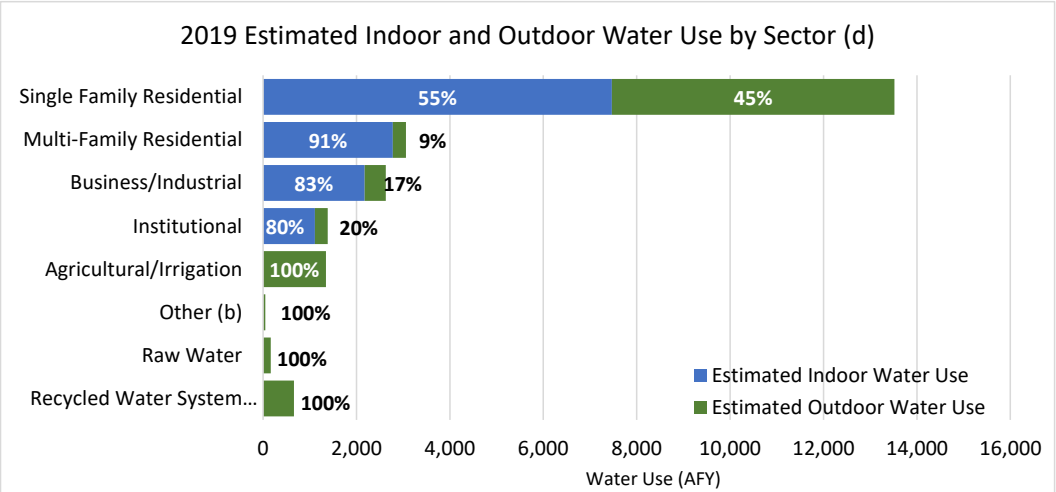
(b) The recycled water system is supplemented with potable water to meet demands, as necessary. Recycled water use shown here reflects all water served through the recycled water system. Potable make-up water volume is shown in Table 3-2.

References:

1. Marin Municipal Water District, 2020. 2010-2019 Urban Water Management Plan Water Use Data, provided by Marin Municipal Water District on 9 July 2020.

Table 3-7
Estimated Indoor and Outdoor Water Use
Marin Municipal Water District

Water Use Sector (a)	2017				2018				2019				Average Pct.	
	Indoor Water Use (AFY)	Outdoor Water Use (AFY)	Pct. Indoor	Pct. Outdoor	Indoor Water Use (AFY)	Outdoor Water Use (AFY)	Pct. Indoor	Pct. Outdoor	Indoor Water Use (AFY)	Outdoor Water Use (AFY)	Pct. Indoor	Pct. Outdoor	Indoor Use	Outdoor Use
Single Family Residential	7,378	5,892	56%	44%	8,984	4,835	65%	35%	7,470	6,046	55%	45%	59%	41%
Multi-Family Residential	2,674	321	89%	11%	2,782	274	91%	9%	2,776	281	91%	9%	90%	10%
Business/Industrial	2,121	499	81%	19%	2,277	388	85%	15%	2,174	451	83%	17%	83%	17%
Institutional	1,144	228	83%	17%	1,153	212	85%	15%	1,112	273	80%	20%	83%	17%
Agricultural/Irrigation	0	1,369	0%	100%	0	1,417	0%	100%	0	1,348	0%	100%	0%	100%
Other (b)	0	35	0%	100%	0	38	0%	100%	0	50	0%	100%	0%	100%
Total (Potable)	**13,318**	**8,344**	**61%**	**39%**	**15,197**	**7,164**	**68%**	**32%**	**13,532**	**8,450**	**62%**	**38%**	**64%**	**36%**
Raw Water	0	310	0%	100%	0	309	0%	100%	0	164	0%	100%	0%	100%
Recycled Water System (c)	0	647	0%	100%	0	657	0%	100%	0	661	0%	100%	0%	100%
Total (Potable, Raw & Recycled)	**13,318**	**9,300**	**59%**	**41%**	**15,197**	**8,129**	**65%**	**35%**	**13,532**	**9,274**	**59%**	**41%**	**61%**	**39%**

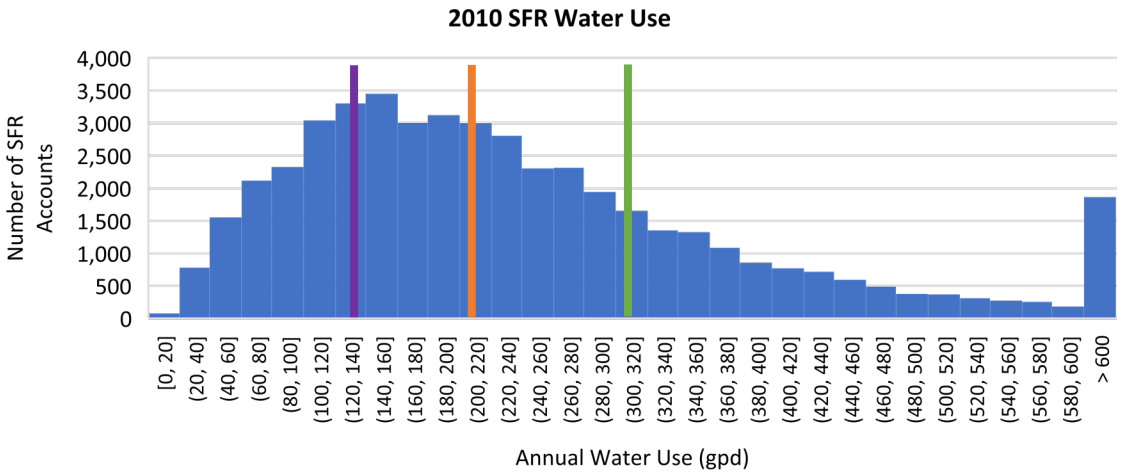


Abbreviations:
AFY = acre-feet per year
Pct. = Percentage
MMWD = Marin Municipal Water District

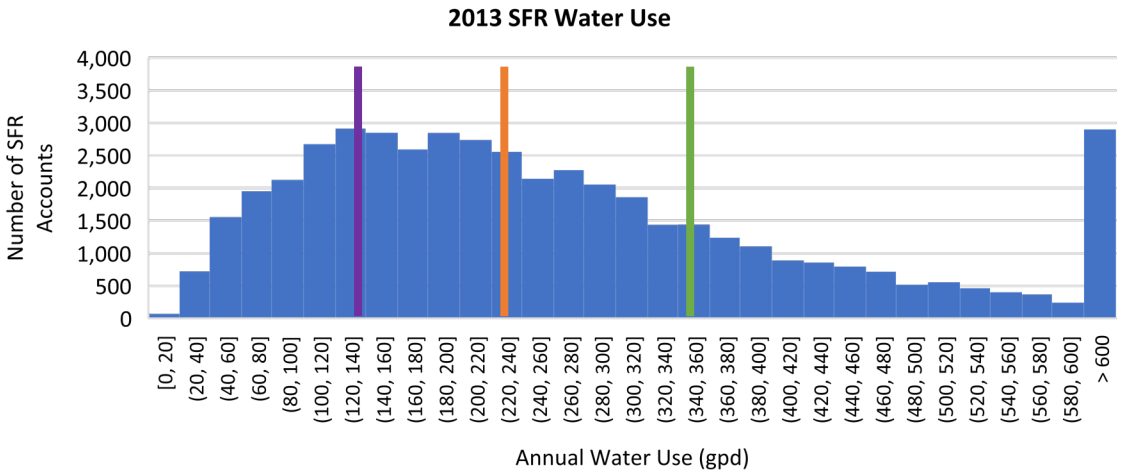
Table 3-7
Estimated Indoor and Outdoor Water Use
Marin Municipal Water District

Notes:
(a) Due to a limitation of the MMWD billing data system, data shown is approximately 0.4% less than the actual total water use shown in Table 3-2.
(b) "Other" includes fireline and hydrant sectors.
(c) The recycled water system is supplemented with potable water to meet demands, as necessary. Recycled water use shown here reflects all water served through the recycled water system. Potable make-up water volume is shown in Table 3-2.
(d) The minimum average daily water use from November through April was used to estimate indoor water use for all non-irrigation customer sectors. This method is used to assess relative proportion of indoor and outdoor use, and conservatively errs on the side of estimating more indoor water use, so that the potential for outdoor water savings is not over-estimated. Raw water, recycled water, agricultural/irrigation and "other" sectors are considered outdoor use only.

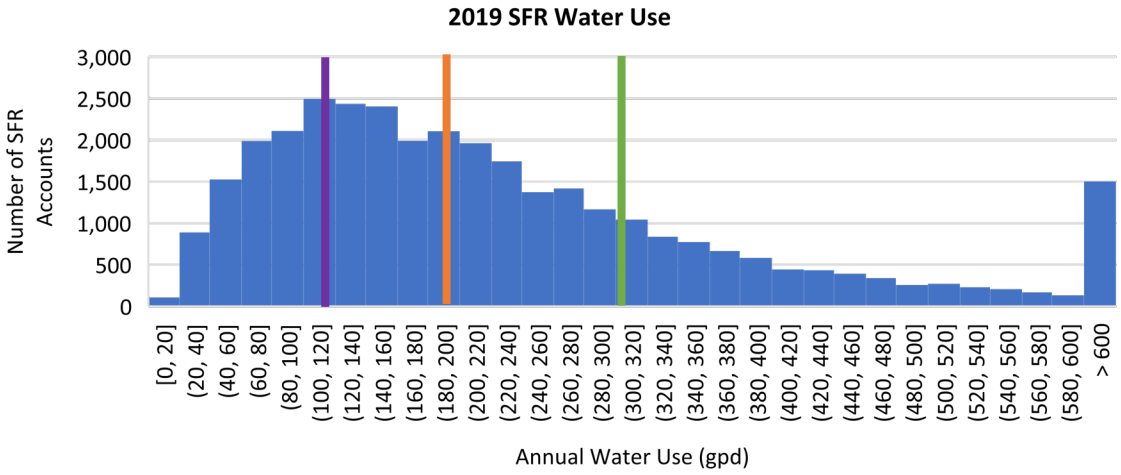
References:
1. Marin Municipal Water District, 2020. 2010-2019 Urban Water Management Plan Water Use Data, provided by Marin Municipal Water District on 9 July 2020.



Count	47,616
Average	246 gpd
25th Percentile	131 gpd
Median	207 gpd
75th Percentile	307 gpd



Count	47,846
Average	275 gpd
25th Percentile	139 gpd
Median	227 gpd
75th Percentile	346 gpd



Count	47,630
Average	241 gpd
25th Percentile	117 gpd
Median	193 gpd
75th Percentile	301 gpd

Abbreviations
gpd = gallons per day
SFR = single-family residential

Legend
- = 25th Percentile (25% of data are lower than this value)
- = Median (50% of data are lower than this value)
- = 75th Percentile (75% of data are lower than this value)

Notes
1. Charts represent histograms (distribution) of SFR water use for three selected years. Data included in chart are limited to SFR accounts that received six water bills in the specified year.

References
1. Marin Municipal Water District, 2020. Customer Billing History, provided by Marin Municipal Water District on 9 July 2020.

SFR Water Use over Time

Marin Municipal Water District
December 2020
C00004.00

eki environment & water

Figure 3-1

4. WATER DEMAND PROJECTIONS

The purpose of this section is to document the basis, methodology, and resulting projected demands for the District through 2045. As described in more detail below, the future water demands for the District were estimated by:

1. Applying an estimated growth rate to accounts within each water use sector based on projected population and employment growth rates,
2. Identifying known planned developments within the District to verify that account growth projections consider all anticipated growth,
3. Evaluating and selecting water demand factors for each water use sector based on review of recent average per account water use representing three scenarios,
4. Estimating future passive savings using the Alliance for Water Efficiency (AWE) Water Conservation Tracking Tool (AWE model), and
5. Calculating estimated future water demand that incorporates the anticipated account growth, water demand factors, and estimated future passive water savings.

This methodology is consistent with California Water Code (CWC) § 10631(d)(4)(A), which requires that "Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area." The assumptions used as the bases for demand projections were developed in close coordination with the District and reflect a land-use based approach consistent with the District's community planning.

4.1. Basis for Account Growth Projections

Water demand increases as new accounts are added to the system, among other factors. In order to estimate how accounts will grow within the District, recent historical account growth within the District was considered, as well as projected future growth in population and employment. As described below, it was assumed, that depending on the customer sector, the number of accounts will grow at the same *rate* as the projected population or employment growth.

Table 4-1 presents historical population and 2018 Association of Bay Area Governments (ABAG) Plan Bay Area Projections 2040 population and employment growth projections for the District, in context with recent historical population estimates.[7]

Table 4-2, identifies which growth projection was applied to each potable water use sector (population or employment) at the District's direction, identifies the average annual growth rate in accounts observed

[7] Several growth projections were evaluated as potential bases for growth assumptions, including previous 2013 ABAG Plan Bay Area Projections (ABAG, 2013), ABAG Plan Bay Area Projections 2040 (ABAG, 2018), and 2020 Department of Finance (DOF) Total Estimated and Projected Population for California and Counties (DOF, 2020). The DOF (2020) projections are only available at the County-wide level and show a decline in population over the planning horizon and given the recent historical growth observed in the District, are not considered appropriately conservative for planning purposes. Although anticipated to be released in 2020, updated ABAG projections are not yet available. Therefore ABAG (2018) projections were selected as the basis for growth assumptions for the District.

within the District (based on data presented in **Table 3-3**), and the associated average annual growth rate projected by ABAG (2018). With the exception of agricultural/irrigation accounts, recent historical growth rates have been lower than the projected growth rates by ABAG (2018). Recycled water actually decreased by 0.22% over the recent historical time period, and raw water accounts decreased by half.[8] At the District's direction, ABAG (2018) projected growth rates were used and are considered to be reasonably conservative for planning purposes.

The planning horizon for the 2020 UWMP is 2045; however, the ABAG (2018) projections extend only through 2040. For purposes of demand projections, it is therefore assumed that the projected growth rates from 2035 through 2040 extend through 2045.

Table 4-2
Historical and Projected Account Growth Rate by Customer Sector

Water Use Sector	Basis for Account Growth	Average Annual Growth (a)	
		Historic (2010-2019)	ABAG 2018 (2020-2045)
Single Family Residential	population	0.076%	0.34%
Existing Accounts			
New Accounts			
Multi-Family Residential	population	0.056%	0.34%
Business/Industrial	employment	-0.068%	0.15%
Institutional	employment	0.10%	0.15%
Agricultural/Irrigation	employment	0.27%	0.15%
Other	employment	0.26%	0.15%
Raw Water[8]	employment	-50%	0.15%
Recycled Water	employment	-0.22%	0.15%

Abbreviations:
ABAG = Association of Bay Area Governments

Notes:
(a) Growth is presented on an average annual basis over the indicated period. When applied to account growth, the specific growth rate between each 5-year period, per ABAG (2018) was applied.

4.2. Change in Number of Accounts based on Projected Growth

Table 4-3, presents the projected increase in accounts over the planning horizon as well as the incremental increase in accounts from 2019 per sector. There are no known major developments within the District's service area, and thus the projected increase in accounts reflects the assumed level of growth described in Section 4.1.

4.3. Water Demand Factors

Water use rates are influenced by a variety of factors, including weather, economic recession, and state and local regulations, among other drivers. Given this, selecting a "representative" baseline year is

[8] The number of raw water accounts dropped from 2 to 1 over this time period.

important to developing the land-use based water demand factors to estimate baseline water use by existing customers, which can then be extrapolated and applied to future growth within the District.

Water demand factors based on historical use within the District were used as the basis of future demand projections for potable water accounts, considering in particular the range of water use associated with pre-drought conditions, post-drought conditions, and a midpoint scenario that assumes water use partially rebounds to pre-drought conditions. **Table 3-2** provides historical water use by sector within the District. To more fully capture total water use within the District, non-revenue water is estimated as a percentage of water production as discussed in 4.3.2.

4.3.1. Potable, Raw, and Recycled Water

As shown in **Table 4-4**, the District evaluated a range of water demand factors for each water use sector using three water use scenarios, based primarily on recent historical average per account water use for selected time periods,[9] representing pre-drought water use rates, post-drought water use rates, and a partial rebound to pre-drought water use rates. Specifically:

1. *Pre-drought demand factors* based on the maximum per account water use by sector for 2011 through 2013 (**Table 3-4a**), generally representing higher water use before drought restrictions were put in place.
2. *Post-drought demand factors* based on the maximum per account water use by sector for 2017 through 2019 (**Table 3-4a**), generally representing lower water use than pre-drought conditions but with some amount of rebound.
3. *Partial rebound demand factors* estimated as the midpoint of the pre-drought and post-drought demand factors, representing an average of the two scenarios.

[9] Given the results discussed in Section 3.4, water demand factors for new SFR accounts are based on water use for homes constructed in 1994 and later.

Table 4-4
Potential Water Demand Factors Considered

Water Use Sector	Water Demand Factor (GPD/account)		
	Pre-Drought (2011-2013)	Partial Rebound	Post-Drought (2017-2019)
Single Family Residential			
Existing Accounts	270	255	240
New Accounts	365	350	335
Multi-Family Residential	795	758	720
Business/Industrial	785	759	734
Institutional	6,228	5,839	5,449
Agricultural/Irrigation	1,708	1,595	1,482
Other	89	90	92
Raw Water	156,569	147,509	138,449
Recycled Water	2,252	2,129	2,006

Abbreviations:
GPD = gallons per day

As shown in **Table 4-5**, below, for purposes of developing the District's 2045 demand projections, the District directed EKI to apply partial rebound demand factors to residential and raw water sectors and pre-drought demand factors to all other sectors.

Table 4-5
Selected Water Demand Factors

Water Use Sector	Water Demand Factor (GPD/account)	Basis for Demand Factor
Single Family Residential		
Existing Accounts	255	Partial rebound
New Accounts	350	Partial rebound
Multi-Family Residential	758	Partial rebound
Business/Industrial	785	Pre-drought
Institutional	6,228	Pre-drought
Agricultural/Irrigation	1,708	Pre-drought
Other	89	Pre-drought
Raw Water	147,509	Partial rebound
Recycled Water	2,252	Pre-drought

Abbreviations:
GPD = gallons per day

The recycled water system is supplemented with potable water to meet demands, as necessary. Between 2010 and 2018, potable water was used to meet between 9% and 30% of recycled water system demand; in 2019, the recycled water plant was shut down due to upgrades and 100% of recycled water demand was met by potable water. However, following plant upgrades, it is anticipated that all demand by the recycled

water system will be met by recycled water, thus demand projections are based on total recycled water system use, and do not include a projection of potable make-up water.

4.3.2. Non-Revenue Water (Potable Water System)

Non-revenue water is water that has been produced but not billed, and thus does not generate revenue for the supplier. Non-revenue water includes unbilled authorized uses (such as water for fighting fires and flushing mains) and water losses (including real losses due to distribution system leaks and apparent losses due to metering inaccuracies). For the purposes of this assessment, non-revenue water is estimated as total potable water produced minus the total billed potable water use on an annual basis. As shown in **Table 4-6**, potable non-revenue water is projected to range from 2,758 AFY to 2,777 AFY through 2045, based on the average percentage of non-revenue reported from 2017 to 2019 (10%, see **Table 3-2**).

4.4. Passive Water Savings Estimates

Passive water savings are the water savings associated with the natural replacement of older toilets, showerheads, clothes washers, and other water using appliances with newer high efficiency devices that are available due to both market shifts and increasing efficiency mandated by the building code and other regulatory requirements. The AWE model[10] was used to estimate future passive savings within the District. The AWE model takes into account estimates of historical population, residential building stock, number of accounts, and projected population and account growth to estimate future passive savings. The estimated passive savings are presented in **Table 4-6** and are subtracted from the water demand projected based on the water demand factors described in Section 4.3 above. Passive savings are only applied to potable water use.

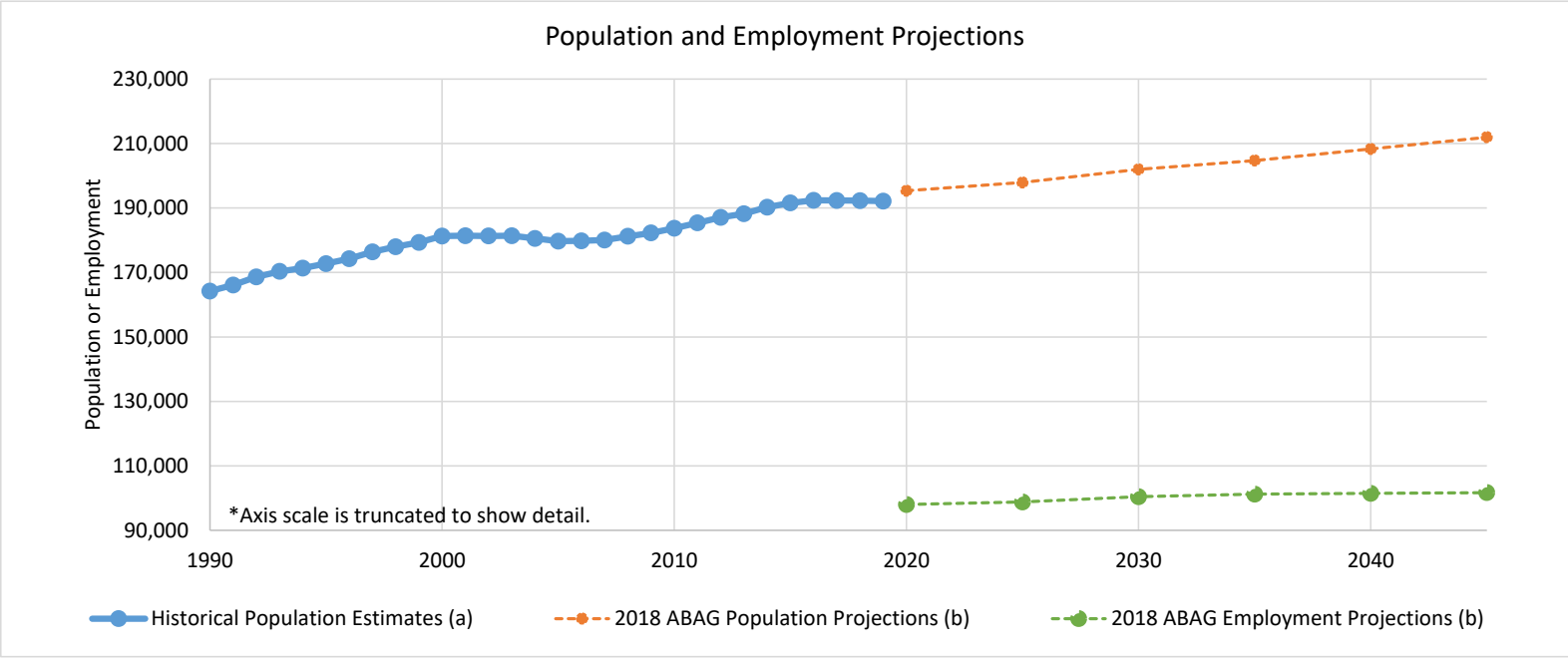
4.5. Projected Water Demand Through 2045

Future water demand was projected for each sector based on their respective demand factors, and is shown in **Table 4-6**. Potable and raw water demand is projected to increase to 26,915 AFY in 2045, which is a 4.9% increase over 2019 potable and raw water demand. Recycled water demand is projected to increase to 771 AFY, which is a 17% increase over the 2019 recycled water system demand. Both potable and raw water, and recycled water demand projections are higher than the District's 2015 UWMP demand projections.

[10] Alliance for Water Efficiency, Water Conservation Tracking Tool Version 3, released in July 2016.

Table 4-1
Population and Employment Growth Projections
Marin Municipal Water District

Category	Growth Projections											Total Growth Rate 2020-2045	Average Annual Growth Rate 2020-2045
	2015	2016	2017	2018	2019	2020	2025	2030	2035	2040	2045 (c)		
Population													
Historical Population Estimates (a)	191,575	192,402	192,328	192,277	192,138	--	--	--	--	--	--	--	--
2018 ABAG Population Projections (b)	--	--	--	--	--	195,360	197,939	201,987	204,750	208,324	211,961	8.5%	0.34%
Employment													
2018 ABAG Employment Projections (b)	--	--	--	--	--	98,019	98,822	100,449	101,246	101,474	101,703	3.8%	0.15%



Abbreviations:
-- = not available
ABAG = Association of Bay Area Governments
DOF = California Department of Finance
MMWD = Marin Municipal Water District

Table 4-1
Population and Employment Growth Projections
Marin Municipal Water District

Notes:

(a) Historical population estimates are adjusted from DOF county estimates using a conversion factor provided by the District, per Reference 3. 2016-2020 estimates were updated using 2020 DOF population estimates, per Reference 2.

(b) 2018 ABAG population and employment projections per Reference 1. Unincorporated county population and employment is adjusted for proportion within the MMWD service area using a conversion factor provided by the District (i.e., 76% of unincorporated population/employment), per Reference 3.

(c) ABAG 2018 includes projections through 2040. 2045 population and employment projections are calculated based on 2035-2040 growth rates (1.7% and 0.23%, respectively).

References:

1. ABAG, 2018. Association of Bay Area Governments, Plan Bay Area Projections 2040, released on November 2018.
2. DOF, 2020. California Department of Finance - Demographic Research Unit, Population Estimates for Cities, Counties, and the State, 2011-2020, with 2010 Benchmark, Report E-4, released on 1 May 2020.
3. Marin Municipal Water District, 2020. MMWD Population 2019 Demand Analysis.xls, provided by Marin Municipal Water District on 9 April 2020.

Table 4-3
Change in Number of Accounts based on Projected Growth
Marin Municipal Water District

Projected Number of Accounts

Water Use Sector	Number of Accounts (a)				
	2025	2030	2035	2040	2045 (b)
Single Family Residential (c)	52,410	53,482	54,214	55,160	56,123
Multi-Family Residential (d)	3,857	3,936	3,990	4,060	4,130
Business/Industrial	3,266	3,320	3,346	3,353	3,361
Institutional	229	233	235	235	236
Agricultural/Irrigation	866	881	888	890	892
Other (e)	495	503	507	508	509
Raw Water	1	1	1	1	1
Recycled Water	297	302	304	305	306
Total Accounts	**61,422**	**62,657**	**63,484**	**64,512**	**65,558**

Incremental Increase in Accounts from 2019

Water Use Sector	Number of Accounts				
	2025	2030	2035	2040	2045
Single Family Residential (c)	817	1,889	2,621	3,567	4,530
Multi-Family Residential (d)	60	139	193	263	333
Business/Industrial	32	86	112	119	127
Institutional	2	6	8	8	9
Agricultural/Irrigation	8	23	30	32	34
Other (e)	5	13	17	18	19
Raw Water	0	0	0	0	0
Recycled Water	3	8	10	11	12
Total New Accounts	**928**	**2,163**	**2,990**	**4,018**	**5,064**

Estimate of Known Planned Development

Water Use Sector	Number of Accounts (f)				
	2025	2030	2035	2040	2045
Single Family Residential (c)	--	--	--	--	--
Multi-Family Residential (d)	--	--	--	--	--
Business/Industrial	--	--	--	--	--
Institutional	--	--	--	--	--
Agricultural/Irrigation	--	--	--	--	--
Other (e)	--	--	--	--	--
Raw Water	--	--	--	--	--
Recycled Water	--	--	--	--	--
Total New Accounts	**--**	**--**	**--**	**--**	**--**

Table 4-3
Change in Number of Accounts based on Projected Growth
Marin Municipal Water District

Abbreviations:
-- = not available
ABAG = Association of Bay Area Governments

Notes:
(a) Growth in number of accounts is estimated based on ABAG 2018 projected growth rates for population and employment. Residential sectors are estimated relative to population growth, and growth in all other account types are estimated relative to employment growth.

(b) ABAG 2018 includes projections through 2040. For the purposes of demand and account projections, it is assumed that the growth rate remains constant from 2036 through 2045.

(c) Single-family residential includes irrigation.
(d) Multi-family residential includes duplexes and 3-10+ unit apartments.
(e) "Other" includes fireline and hydrant sectors.
(f) No new developments are currently known/anticipated.

References:
1. ABAG, 2018. Association of Bay Area Governments, Plan Bay Area Projections 2040, released on November 2018.

Table 4-6
Projected Water Demand
Marin Municipal Water District

Water Use Sector	Projected Demand (AFY) (a)				
	2025	2030	2035	2040	2045
Potable and Raw Water					
Single Family Residential (b)					
Existing Accounts	14,751	14,751	14,751	14,751	14,751
New Accounts (c)	321	741	1,028	1,399	1,777
Multi-Family Residential (d)	3,275	3,342	3,388	3,447	3,507
Business/Industrial	2,875	2,922	2,945	2,952	2,959
Institutional	1,600	1,627	1,640	1,643	1,647
Agricultural/Irrigation	1,659	1,686	1,700	1,704	1,707
Other (e)	49	50	51	51	51
Potable Water Served through Recycled Water System (f)	0	0	0	0	0
Raw Water	171	174	176	176	176
Non-revenue Water (Potable) (g)	10%	10%	10%	10%	10%
	2,758	2,760	2,753	2,761	2,777
Estimated Passive Savings (h)	-733	-1,301	-1,749	-2,125	-2,437
Total Potable and Raw Water Demand	**26,726**	**26,753**	**26,682**	**26,758**	**26,915**
Recycled Water					
Recycled Water	750	762	768	770	771
Total Recycled Water Demand	**750**	**762**	**768**	**770**	**771**

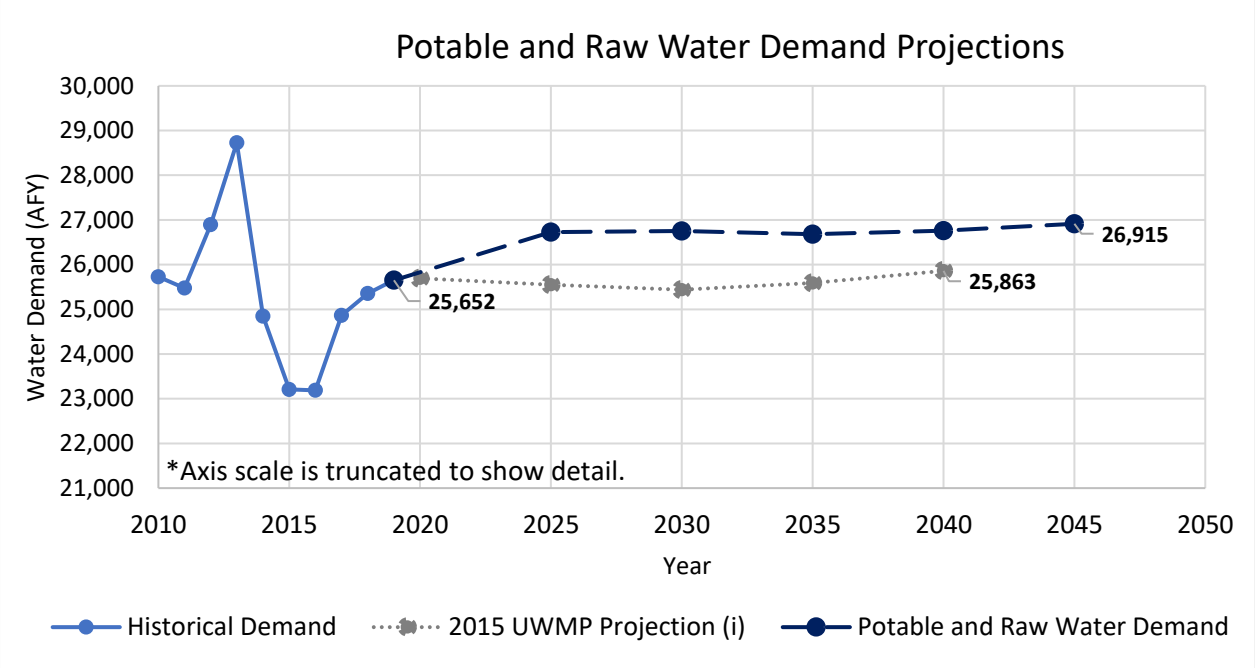
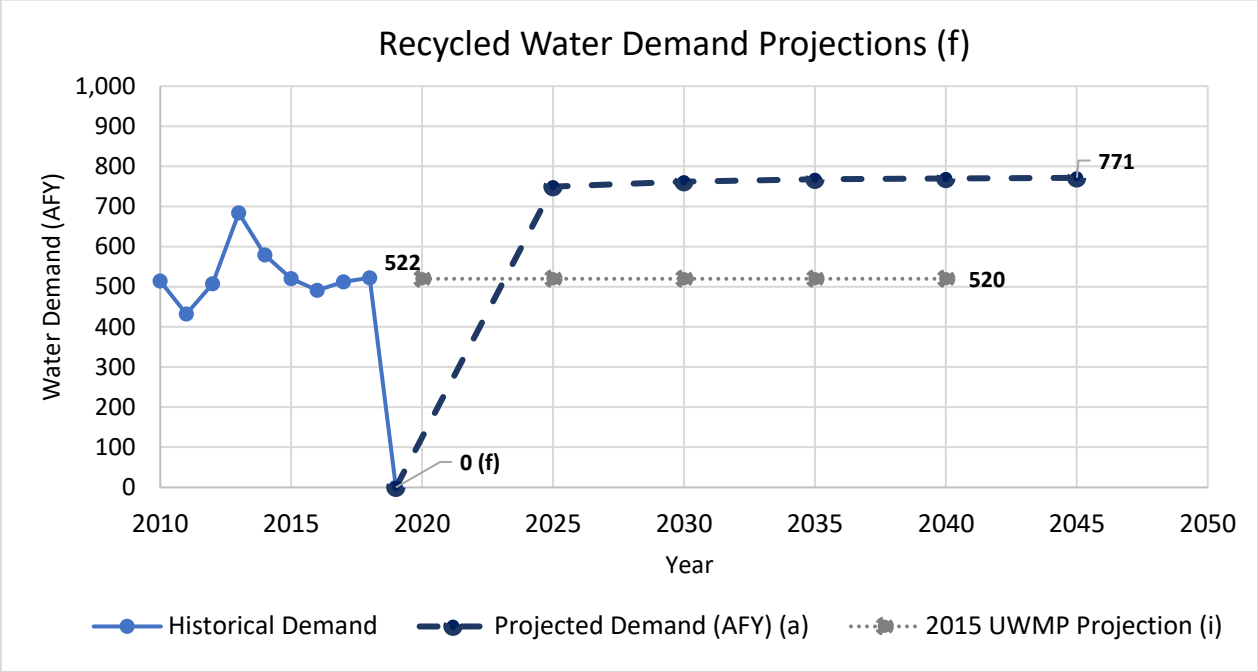


Table 4-6
Projected Water Demand
Marin Municipal Water District



Abbreviations:
ABAG = Association of Bay Area Governments
AFY = acre-feet per year
AWE = Alliance for Water Efficiency
UWMP = Urban Water Management Plan

Notes:
(a) Water demand projections are estimated based on partial rebound demand factors for residential and raw water sectors and pre-drought demand factors for all other sectors, based on recent historical use. Growth in accounts is based on ABAG 2018 projections, as identified in Table 4-1.
(b) Single-family residential includes irrigation.
(c) Water demand factors for new single family residential accounts are based on water use per dwelling unit for buildings constructed in 1994 and later.
(d) Multi-family residential includes duplexes and 3-10+ unit apartments.
(e) "Other" includes fireline and hydrant sectors.
(f) The recycled water system is supplemented with potable water to meet demands, as necessary. The recycled water plant was shut off in 2019 to allow for infrastructrure upgrades. Following the upgrades, potable make-up water to the system, if any, is expected to be de minimis.
(g) Estimates of potable and raw non-revenue water are based on the average percentage non-revenue water for 2017 through 2019, per Table 3-2.
(h) Passive water savings are based on the AWE Conservation Tracking Tool.
(i) 2015 UWMP projections per Reference 2 and include raw water demand.

Table 4-6
Projected Water Demand
Marin Municipal Water District

References:

1. ABAG, 2018. Association of Bay Area Governments, Plan Bay Area Projections 2040, released on November 2018.
2. Marin Municipal Water District, 2016. Urban Water Management Plan – 2015 Update, prepared by RMC Water and Environment, dated June 2016.

5. CONSERVATION PROGRAM PARTICIPATION

The following section evaluates historical participation in water conservation programs by District customers and the estimated water savings associated with that participation. This information is used to inform future program selection and implementation assumptions, and to support the demand management measure (DMM) reporting required in UWMPs under CWC § 10631.(e).[11]

For five water conservation programs selected by the District, additional analyses have been conducted, including: (1) a refined estimate of the actual water conservation savings achieved by District customers based on customer billing data (Section 5.3.2), and (2) program participation trends in relation to spatial distribution (Section 5.4), property characteristics (Section 5.5), and customer demographics (Section 5.6). The following five programs were included in the detailed analyses:

1. Advanced Metering Infrastructure (AMI) Leak Notifications Program
2. Rain Barrel Rebate Program
3. Residential High Efficiency Clothes Washer (HECW) Rebate Program
4. SFR Water Use Surveys/Audits Program
5. SFR Weather-Based Irrigation Controller (WBIC) Rebate Program

The goals of these more detailed analyses are to identify participation drivers and to help the District better understand which customers are participating in which programs. The District can accordingly use this information to inform the strategic design, selection, and marketing of future conservation programs and services.

5.1. Conservation Programs

The District currently provides a broad variety of conservation programs directly to customers. These programs are described in **Table 5-1** below.

Table 5-1
Description of Conservation Programs

Program	Description	Eligible Customer Class	Program Run Dates
CII Water Use Evaluation Program	CII customers are provided on site water use evaluations, recommendations to improve efficiency, and pre-qualified for applicable rebates.	CII	1995 - Current
AMI Leak Notifications Program	Customers with AMI meters receive notifications of water use patterns indicative of leaks. Rather than having to wait until their next water bill, customers are able to receive timely information and stop leaks much faster. Water Efficiency staff runs automated reports	SFR, CII, Ag. & Irr.	2018 - Current

[11] The information presented herein supports a portion of the required DMM analysis, focusing on device and education-focused programs. Additional details regarding customer billing rates and structure, conservation staffing levels, customer metering, etc. are required under CWC § 10631.(e), but not addressed herein.

Table 5-1
Description of Conservation Programs

Program	Description	Eligible Customer Class	Program Run Dates
	to monitor water use of AMI customers. AMI meters record water use in 15 minute intervals as compared to every other month as is typical for most residential meter reads.		
HET Rebate Program	**2007-2010**: Up to a $250 rebate when customers upgrade a tank-style 3.5 gpf or higher to a new, high-efficiency model. **2013-Current**: Up to $100 rebate to replace a 3.5 gpf or more per flush or a 1.6 gpf model year 2001 or older with an HET.	SFR	2007 - 2010 2013 - Current
HET Direct Install Program	Free HET and installation to replace existing 3.5 gpf toilets.	MFR, CII	2013 - 2015
Hot Water Recirculating System	Single family or duplex residential customers can apply for a rebate up to $50 towards the cost of a hot water recirculating system to create a looped system to recirculate cold water back to the water heater.	SFR	2014 - 2019
Irrigation Improvement Equipment Program	Commercial and multi-family customers can apply for a rebate up to $1,500 when they install qualifying irrigation equipment to improve outdoor water use efficiency.	Ag. & Irr.	2015 - 2017
Landscape Plan Review Program	MMWD has developed water conservation requirements for landscape professionals and homeowners when designing and installing landscapes and irrigation systems. Plan review requirements apply to all new construction and rehabilitated (renovations or changes made to sites with an existing irrigation system) landscape projects requiring a building permit, plan check, or design review.	SFR, CII	1986 - Current
Large Landscape WBIC Rebate Program	Commercial customers can apply for a rebate up to $30 per active irrigation station when they purchase and install a new weather based irrigation controller to replace an existing standard controller.	Ag. & Irr.	2013 - 2015
Laundry-to-Landscape System	Single family or duplex residential customers can apply for a rebate up to $50 towards the cost of a 3-way diverter valve and/or air vent. Products must be installed as part of a residential laundry to landscape system that uses discharge water from a single domestic clothes washer in a one or two family dwelling.	SFR	2015 - 2019
Organic Mulch Rebate Program	Single family or duplex residential customers can apply for a rebate up to $50 towards the cost of organic mulch. By applying mulch to their gardens, customers will be able to adjust their irrigation schedules as they	SFR	2014 - 2019

Table 5-1
Description of Conservation Programs

Program	Description	Eligible Customer Class	Program Run Dates
	realize mulched areas of their gardens can remain healthy with less water.		
Pool Cover Rebate Program	Single family or duplex residential customers can apply for a rebate up to $50 towards the cost of a pool cover. Covering a swimming pool when it is not in use is the most effective means of reducing evaporative water loss.	SFR	2014 - 2019
Rain Barrel Rebate Program	**2014-2019**: Single family or duplex residential customers can apply for a rebate up to $50 towards the cost of a rain barrel to collect rainwater that can be used to supplement landscape irrigation. **2020**: Residential and commercial customers with active potable water service can apply for a rebate up to $0.50 per gallon of storage when they install rain barrels and/or cisterns at their sites. Total rebates for rain barrels and cisterns may not exceed $1,000 per site.	SFR	2014 – 2019 2020 - Current
Residential HECW Rebate Program	MMWD customers can apply for a rebate towards the cost of installing a qualifying residential high-efficiency clothes washer that meets current water and energy efficiency requirements.	SFR	1998 - 2010 2013 – Current
SFR Turf Removal Program	MMWD customers participated in the state Save Our Water turf replacement program, which offered $2/sq ft of turf removed.	SFR	2015 - 2016
SFR Water Use Surveys/Audits Program	A free service for SFR customers that involves a visit to their property to review water use and identify ways to save water indoors and outside.	SFR	1995 - Current
SFR WBIC Rebate Program	Residential customers can apply for a rebate up to $20 per active irrigation station when they purchase and install a new weather based irrigation controller to replace an existing standard controller.	SFR	2013 - 2015
Tier 4 Exemption Program	An incentive program designed to help save water and lower customer's water bill. To qualify, customers must meet the District's current water conservation standards and pass a verification site visit. The customer's property then becomes exempt from Tier Four water rates for a two-year period. This means their water will be billed at no higher than Tier Three rates.	SFR	2004 - 2015
Time of Sale (Toilet Retrofit) Program	An ordinance-based program that required the installation of low flow plumbing (toilets no greater than 1.6 gpf and pressure reducing valves set at no greater than 50 psi unless required for irrigation) at	SFR	2002 - 2006

Table 5-1
Description of Conservation Programs

Program	Description	Eligible Customer Class	Program Run Dates
	the time of resale. Ordinance applied to SFR, multi-family and hotel/motel structures.		
ULFT Rebate Program	Offered a rebate of up to $75 or $100 when customers upgrade a tank-style 3.5 gpf or higher to a new, 1.6 gpf model.	SFR	1993 - 2007
WaterSense Smart Controller Rebate	Residential and commercial customers can apply for a rebate up to $100 towards the cost of a qualifying EPA WaterSense weather-based irrigation controller.	SFR, CII	2020-Current
Water Use Surveys/Audits Program (Excluding SFR Participants)	Consultation activities include a review, evaluation and report of indoor plumbing devices and/or a review and report of the landscape irrigation system.	MFR, CII, Ag. & Irr.	1995 - Current
Water Waste Report Program	The general public can report water waste situations to MMWD online or over the phone. These contacts are logged into a database and followed up on by field staff to research and notify properties about water waste situations.	SFR, CII	1998, 2000 - Current
Water-wise Community Garden Program	The Water-Wise Community Gardens program provided resources and rebates for school and community gardens to improve water efficiency. Implementation of a water-related project or improvement to the irrigation system could qualify for a rebate of up to $1,000 per site.	CII, Ag. & Irr.	2017

Abbreviations:
Ag. = agricultural
AMI = Advanced Metering Infrastructure
CII = commercial, industrial and institutional
EPA = Environmental Protection Agency
gpf = gallons per flush
HECW = high efficiency clothes washer
HET = high-efficiency toilet
Irr. = irrigation
MF = multi-family
MFR = multi-family residential
MMWD = Marin Municipal Water District
psi = pounds per square inch
SFR = single family residential
sq ft = square feet
ULFT = ultra low flow toilet
WBIC = Weather Based Irrigation Controller

In addition to programs offered by the District, several regional-based programs are offered through the SMSWP, including: (1) education and outreach to schools, (2) public outreach and educational workshops, (3) Qualified Water Efficient Landscaper (QWEL) Training, and (4) garden tours. Currently, the District implements its own school education and outreach programs separate from the SMSWP.

5.2. Historical Conservation Program Participation

As shown in **Table 5-2**, the District has implemented 22 different conservation programs offered directly to customers from 1986 through 2020. Of the programs implemented by the District, the ultra low flow toilet (ULFT) Rebate Program, Residential High Efficiency Clothes Washer (HECW) Rebate Program, and SFR Water

Use Surveys/Audits Program had the highest participation, with 27,269, 17,807, and 12,837 participants, respectively. Through the SFR Turf Removal Program, over 55,000 sq ft of turf has been removed.

Table 5-3 summarizes District participation in the regional SMSWP water conservation school education and outreach programs during the 2007-2008 through 2019-2020 school years. Over this period, over 74,000 students were reached through 20 different programs, including assemblies, presentations, workshops and other educational materials.

5.3. Estimated Savings from Past Programs

5.3.1. Estimated Water Savings Based on AWE Model

The AWE model[12] was used to estimate water savings associated with the implementation of all device or turf replacement and audit programs identified in **Table 5-2** for the period of 2010 to 2020. Water savings estimates were based on District-specific values calculated per Section 5.3.2, AWE model default values, values developed for the District in 2015, and other literature values, as needed. The specific assumptions used in this assessment are presented in **Appendix B**. The results of this analysis are presented in **Table 5-4**.

Based on the record of water conservation program participation within the District and application of the AWE Model, it is estimated that the District conservation programs included in this assessment resulted in a savings of between 1,441 AFY and 6,366 AFY between 2010 and 2020.[13] In addition, over this period, it is estimated that the District saved 8,352 AFY through passive savings. Thus, the total active and passive savings achieved by the District between 2010 and 2020 is estimated to be between 13,277 AFY and 14,718 AFY.

5.3.2. Estimated Water Savings for Selected Programs Based on Customer Billing Data

Water use savings associated with implementation of specific water conservation programs are typically estimated based on literature values, which may or may not accurately capture the specific ways customers in a specific area (i.e., the District) use water. Therefore, District customer billing data were analyzed using a modified *Difference in Difference Estimation Method* (Columbia Public Health, 2013) to assess the amount of water typically saved through implementation of the selected programs. As described further in **Appendix C**, a version of this method is used to compare the water use patterns in a participant group to that of a cohort group to isolate the impact (in terms of water savings) of participation in a specific water conservation program.

[12] Alliance for Water Efficiency, Water Conservation Tracking Tool Version 3, released in July 2016.

[13] Free ridership refers to customers who participate in a conservation program, but who would have taken the water saving action (e.g., replace a toilet) regardless of whether the conservation program incentive was available. The amount of free ridership is unknown, and thus a range of savings is shown, assuming 0% to 100% free ridership for programs, as appropriate.

Table 5-5 summarizes the average estimated water savings for each selected conservation program from 2010-2018.[14] The AMI Leak Notifications Program demonstrated the most savings at 29,023 gallons per account per year (gal/acct/yr), followed by the SFR WBIC Rebate Program at 17,258 gal/acct/yr.

Table 5-5
Average Estimated Water Savings Achieved by Selected Conservation Programs from 2010-2018

Conservation Program (a)	Number of Participants in Analysis	Estimated Savings due to Program (d) (gal/acct/yr)	Estimated MMWD-Specific Unit Savings (d)	Default AWE Model Unit Savings Factors
AMI Leak Notifications Program (b)	62	29,023	29,023 gal/event/yr	n/a (e)
Residential HECW Rebate Program (b)	1,031	4,281	4,276 gal/unit/yr	5,000 gal/unit/yr
SFR Water Use Surveys/Audits Program (b)	1,682	6,273	6,273 gal/survey/yr	12,373 gal/survey/yr
SFR WBIC Rebate Program (c)	108	17,258	17,258 gal/WBIC/yr	5,639 gal/WBIC/yr (f)

Abbreviations:
acct = account
AMI = Advanced Metering Infrastructure
AWE = Alliance for Water Efficiency
DSS = Decision Support System
gal = gallon
HECW = high efficiency clothes washer
MMWD = Marin Municipal Water District
n/a = not available
SFR = single family residential
sq ft = square feet
WBIC = Weather-Based Irrigation Controller
yr = year

Notes:
(a) This analysis was also performed for the Rain Barrel Rebate Program. However, due to the limited sample size the results were not considered robust and thus are not presented herein.
(b) Program participants included in this analysis are limited to those that: (1) have only participated in the specified program, (2) have only participated in the program in the specified year, and (3) have sufficient water use data within the study periods.
(c) All of the participants have participated in more than one conservation program, thus the analysis is not limited to those that only participated in this program.
(d) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts, as shown in **Tables 5-6a** through **5-6d**. Water savings comparison cohorts for SFR customers are stratified geographically based on Census Block Groups.
(e) Not available for either the AWE or DSS models.
(f) Default value not available in the AWE model. Water savings factor shown is per the District's 2015 DSS Model, and is based on a program that provides multiple types of landscape rebates and other equipment upgrades.

Tables 5-6a through **5-6d** summarize the detailed results of these analyses, including the number of participants included in the analysis for each year, the total amounts rebated, the change in water use by participants and their comparison cohort groups, and the estimated savings values by year and in total.

[14] This time period was selected so that at least two full years of water use billing data could be analyzed following the program participation year.

Table 5-5 also shows the default water savings factors included in the AWE model,[15] which are based on available literature values and other assumptions. Water savings for District customers for the Residential HECW Rebate Program are generally consistent with AWE model default values. However, based on analysis of District customers specifically, water savings for the SFR Water Use Surveys/Audits Program are lower than the default values, and therefore evaluation of potential savings for future programs would be significantly overestimated for District customers if default values are used. Conversely, savings for the SFR WBIC Rebate Program are higher than default DSS model values, resulting in a potential for under-estimation of program savings if the default values were used.

5.4. Spatial Trends in Program Participation

Given the large amount of program participation data for some programs, it can be difficult to ascertain whether participation in these programs has been evenly distributed across the service area, or if participation tends to be clustered in certain regions. In order to identify program participation density for conservation programs in the District service area, a geostatistical spatial analysis was performed.[16] This analysis identifies participation "hot spots," which are areas where a higher density of participation is observed than would be expected by randomly distributed participation. Similarly, "cold spots," or areas of lower than expected participation, are identified. Ineligible parcels (i.e., parcels with no sector use relevant to each respective conservation program) were excluded from each analysis, as well as very large rural SFR parcels (e.g., greater than 10 acres), to reduce skewing of density mapping. High density participation areas are identified in red and low density participation areas are identified in blue on **Figures 5-1a** through **5-1f.**

Figure 5-1a shows the results of the AMI Leak Notifications Program, which includes SFR, CII, and agriculture/irrigation accounts. The rebate and survey programs require a customer to opt-in to participate. Participation in the AMI Leak Notifications Program, however, occurs when a customer is notified once a leak is detected for an account based on AMI data. Areas of higher participation (high incidence of leaks) were focused in the southern portion of the service area in the Cities of Belvedere and Tiburon, with no distinct areas of low participation. **Figure 5-1b** shows the results of this analysis when focused on just the Cities of Belvedere and Tiburon. Within these areas, distinct areas of high participation (or rate of leaks) are identified, primarily in the southern portion of the area, and areas of low participation (or rate of leaks) are identified in the northern and southern portions of the area.

Figures 5-1c through **5-1f** show the results of the participation destiny analysis for the Residential HECW Rebate Program, the Rain Barrel Rebate Program, the SFR Water Use Surveys/Audits Program, and the SFR WBIC Rebates Program, all of which target residential accounts. Participation was similar between

[15] Default value not available in the SFR WBIC Rebate Program. Water savings factor shown is per the District's 2015 DSS Model, and is based on a program that provides multiple types of landscape rebates and other equipment upgrades.

[16] The ESRI ArcGIS 10.8 Optimized Hot Spot Analysis tool was used for spatial hot spot analysis of program participation. The hot spot analysis calculates a Getis Ord GI* statistic for each cell. This statistical z-score evaluates how the event (in this case, participation in the program) clusters spatially, by looking at the cell in the context of the neighboring cells. For the purposes of this study, hot and cold spots are identified as cells with a 90% or greater level of statistical confidence.

the Residential HECW Rebate and SFR Water Use Surveys/Audits Programs, with areas of high participation in the southern and central portions of the service area and low participation in the northwestern portion. The Residential HECW Rebate Program also had more areas of low participation along the western portion of the District. By contrast, the SFR WBIC Rebates Program had only one cluster of high participation towards the southern portion of the service area, while the Rain Barrel Rebate Program had one cluster of high participation in the northern portion of the service area. It should be noted that these programs only included 110 and 162 participants, respectively, and therefore produced less robust results than the other programs that were assessed.

Based on this information, the District could consider targeting outreach to the portions of its service area that have historically had lower program participation, particularly within the Residential HECW Rebate Program and SFR Water Use Surveys/Audits Program.

5.5. Building Stock Characteristics

Certain characteristics related to building age can influence, or at least be correlated with, water use. In general, older homes and businesses tend to have higher water using fixtures that were installed prior to passage of key changes to the Federal and California Plumbing, Energy, and Building Codes; these accounts present an opportunity for increasing water conservation. Homes and businesses with larger landscaped areas tend to use more water than those with smaller landscaped areas. Similarly, larger homes may have more occupants and therefore more water use.

In order to assess the distribution of housing stock and other key water use characteristics, service area-wide data were evaluated based on Marin County Assessor parcel data. These data included lot sizes and building construction date for residential program participants. Building construction date for parcels within the District based on Marin County Assessor data is shown on **Figure 5-2**. This figure shows parcels for all land use types for which building construction date is available (e.g., residential, commercial, open space, etc.).

Building stock characteristics of conservation program participants for each of the selected programs are summarized in **Table 5-7**.[17] The first chart shows the total number of participants by program by age of building construction, while the second chart shows the results after controlling for the relative number of parcels within each age category.

The average year of building construction for each program ranged from 1954 to 1987. The majority of program participants are in homes built prior to 1994, for all programs. When the results are normalized based on total building stock, CII participants in the AMI Leak Notifications Program and Residential HECW Rebate Program had the highest rates of participation for homes constructed prior to 1994.[18] Participation by SFR customers in homes constructed between 1994 and 2009 was notably higher than that of participants with pre 1994 or 2010 and new homes.

[17] Results for SFR, MFR, CII and Irr. participants are shown separately, given the diversity of building stock.

[18] The rebate and survey programs require a customer to opt-in to participate. Participation in the AMI Leak Notifications Program, however, occurs when a customer is notified once a leak is detected for an account based on AMI data.

Based on this analysis, the District appears to be successfully reaching buildings in most age ranges for most programs. However, there appears to be some potential to increase participation in: (1) the Rain Barrel Rebate Program in buildings constructed in 1994 and later, and (2) SFR WBIC Rebates and Water Use Surveys/Audits for customers with homes built prior to 1994 and 2010 and later.

5.6. Demographic Characteristics of Residential Conservation Program Participation

Residential conservation programs are generally open to all residents in the District service area. Although the programs are available to all residents, those with certain demographic characteristics can tend to participate at higher rates than others in some programs. The analyses described in the following sections were performed for the five selected programs in order to better understand trends in customer demographics among residential conservation program participants in the District – specifically, income, whether the home occupants rent or own the property, and household age.

5.6.1. Household Income Trends

Household income data were based on the estimated 2017 median household income by Census Block Group (Census, 2019).[19] The following sections discuss the breakdown of program participation in residential programs by income classification. These income levels are defined as follows: low income (<$94,850/year), moderate income ($94,850-$124,500), and high income (>$124,500), based on Marin County income designations for a three-person household (HCD, 2017). Given that these classifications reflect the median of all households in a given Census Block Group, this reflects the predominant income for that area (neighborhood), but does not mean that every participant or household in that area falls within the same income group.

Figure 5-3a shows the distribution of income groups across the service area and **Table 5-8a** shows the distribution of residential program participants by income level. The first chart in **Table 5-8a** shows the percentage of participants in each program that live in areas of each income level grouping. Across all programs, participation was highest in the high income category, ranging from 53% to 66%, and lowest in the low income category, with participation ranging from 0.78% to 19%.

The second chart on **Table 5-8a** shows participation rates controlled for the number of parcels within the service area within each income group. Customers in all three income groups appear to be well represented in the Rain Barrel Rebate Program and the Residential HECW Programs. The AMI Leak Notifications Program, SFR WBIC Rebate Program, and SFR Water Use Surveys/Audits Program showed very low participation by customers in low income areas and high participation by customers in high income areas.

[19] Census Block Group is the smallest geographical unit for which the United States Census Bureau publishes income data.

These results suggest that there are opportunities to increase program participation by lower income households in the SFR WBIC Rebate Program and Water Use Surveys/Audits Program.[20]

5.6.2. Homeownership Trends

In order to evaluate whether home ownership appears to be a driving factor in program participation, residential program participation was compared to the proportion of the population that live in renter-occupied homes, based on Census data. Rentership status was based on 2017 Census estimates of the population within a Census Block Group that live in a renter-occupied home versus an owner-occupied home (Census, 2019). Rentership is thus presented as the proportion of the population within a Census Block Group that lives in a renter-occupied home. A Census Block Group with a rentership of less than 25% indicates that the area consists primarily of owner-occupied homes, while a rentership population of greater than 75% indicates that the area is predominantly made up of those who rent their homes.

Figure 5-3b shows the distribution of renter-occupancy rate across the District. **Table 5-8b** shows the distribution of residential program participation by the percentage of the population that live in renter-occupied homes ("rentership").

The first chart in **Table 5-8b** shows the percentage of participants in each program that live in areas of each percent rentership grouping. Participation in conservation programs was higher in Census Block Groups with a lower percentage of rentership (high home ownership). Between 51% and 56% of participants across all conservation programs were in Census Block Groups that had less than or equal to 25% rentership, compared to between 0% and 1.0% of participants in the high rentership category (≥ 75% rentership).

The second chart in **Table 5-8b** shows participation rates controlled for the number of customers within the District that fall within each rentership classification. When the relative proportion of number of customers within each rentership group is controlled for, participants in the low rentership (high home ownership) category are 2.6% to 8.1% higher than the overall percentage of customers in the same category. Conversely, participants in the moderate to high rentership groups (≤50%-75% rentership) were underrepresented by 3.2% to 15%.

These results suggest that there are opportunities to increase participation across all programs in areas with higher levels of rentership.

5.6.3. Household Age Trends

Median household age is based on 2017 Census estimates of the median age of household members by Census Block Group (Census, 2019). Median age is broken up as follows: <35 years old, 35-45 years old, 45-55 years old, and >55 years old. Given that these classifications reflect the median age of all household

[20] While the AMI Leak Notifications Program also had lower levels of participation by low income households, given that participation in this program occurs when customers are notified of leaks using AMI data, it is not appropriate to specifically target selected customers for participation.

members in a given Census Block Group, this reflects the predominant age for that area but does not mean that every participant or household in that area falls within the same age group.

Figure 5-3c shows the distribution of median household age by Census Block Group across the service area and **Table 5-8c** shows the distribution of residential program participants by age group. The first chart in **Table 5-8c** shows the percentage of participants in each program that live in areas of each household age grouping. Across all programs, participation was highest for households whose median household member age was between 45-55 years, ranging from 51% to 64%. The lowest participation was in households with a median age of less than 35 years, comprising 0% to 1.2% of all participants.

The second chart in **Table 5-8c** shows participation rates controlled for the number of parcels within the service area within each median household age group. Compared to the overall distribution of customers, there was little difference among age groups for most conservation programs, with the exception of the AMI Leak Notifications Program,[21] which had a higher proportion of participants from households with a median age older than 55 years (19% higher) and a lower proportion of participants 35-45 years (12% lower), and the Rain Barrell Rebate Program, which had a higher proportion of participants from households with a median age between 45 and 55 years (6.3% higher).

These results suggest that, while there are some differences in participation rates across age groups, the District has been generally successful at reaching customers of all age groups in all programs.

5.7. Summary

Sections 5.4 through 5.6 above identify opportunities for the District to increase customer participation in each of the selected programs through targeted outreach to certain customer classes. The results of these analyses can be combined to identify specific customers by overlaying these results spatially. For example, one may identify SFR customers to target with the SFR WBIC Rebate Program by overlaying customers in areas: (1) outside of high participation as identified on **Figure 5-1f**, (2) within low income areas identified on **Figure 5-3a**, and (3) in areas with between 50% and 75% rentership as shown on **Figure 5-3b**. As show on **Figure 5-4,** by overlaying these key metrics, approximately 9,000 SFR customers are identified for potential targeting of SFR WBIC Rebate Program outreach materials.

[21] Participation in the AMI Leak Notifications Program occurs when a customer is notified once a leak is detected for an account based on AMI data, and is not driven by a customer choice to participate.

Table 5-2
Summary of Conservation Program Participation
Marin Municipal Water District

Program Name	End Use		Number of Program Participants																																			Pct. of Accounts (b)
	Sector (a)	Indoor/ Outdoor	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total	
AMI Leak Notifications Program (c)	SFR, CII, Ag. & Irr.	Both	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	690	1,187	**1,877**	**3.4%**
CII Water Use Evaluation Program	CII	Both	--	--	--	--	--	--	--	--	--	25	42	23	40	56	47	17	4	20	42	16	15	33	53	140	65	89	66	47	41	32	35	35	11	4	**998**	**24%**
HET Rebate Program	SFR	Indoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	612	839	1,624	51	--	--	214	1,169	1,226	772	591	427	308	**7,833**	**14%**
HET Direct Install Program (d)	MFR, CII	Indoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	42	124	68	--	--	--	--	**234**	**3.80%**
Hot Water Recirculating System	SFR	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	141	31	26	13	15	**236**	**0.43%**
Irrigation Improvement Equipment Program	Ag. & Irr.	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	30	12	22	--	--	**64**	**4.6%**
Landscape Plan Review Program	SFR, CII	Outdoor	3	6	29	24	28	39	30	21	32	31	36	38	66	29	27	47	46	40	56	50	74	50	42	45	30	50	76	89	72	88	91	104	114	120	**1,723**	**2.9%**
Large Landscape WBIC Rebate Program (c)	Ag. & Irr.	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5	6	--	--	--	--	**11**	**0.80%**
Laundry-to-Landscape System	SFR	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13	1	5	--	--	**19**	**0.035%**
Organic Mulch Rebate Program	SFR	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	87	782	203	107	98	80	**1,357**	**2.5%**
Pool Cover Rebate Program	SFR	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	142	43	10	13	14	**232**	**0.43%**
Rain Barrel Rebate Program (c)	SFR	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19	100	20	11	6	6	**162**	**0.30%**
Residential HECW Rebate Program (c)(e)	SFR	Indoor	--	--	--	--	--	--	--	--	--	--	--	--	720	967	826	942	1,472	1,366	1,344	1,248	1,688	1,537	1,620	1,654	252	--	--	133	675	615	439	187	57	65	**17,807**	**33%**
SFR Turf Removal Program (c)	SFR	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11	44	--	--	--	**55**	**0.10%**
SFR Water Use Surveys/Audits Program (c)	SFR	Both	--	--	--	--	--	--	--	--	--	127	234	380	246	281	470	634	465	319	46	329	83	264	755	892	699	1,102	862	849	1,033	838	498	712	466	253	**12,837**	**24%**
SFR WBIC Rebate Program (c)	SFR	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	66	42	--	--	--	--	**110**	**0.20%**
Tier 4 Exemption Program (c)	SFR	Both	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23	6	7	4	3	3	0	1	2	0	2	2	--	--	--	--	**53**	**0.10%**
Time of Sale (Toilet Retrofit) Program	SFR	Indoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	327	419	630	391	53	--	--	--	--	--	--	--	--	--	--	--	--	--	**1,820**	**3.4%**
ULFT Rebate Program	SFR	Indoor	--	--	--	--	--	--	--	4	3,552	3,425	3,877	5,112	2,779	2,629	2,078	942	2,580	15	56	174	45	1	--	--	--	--	--	--	--	--	--	--	--	--	--	**27,269**	**50%**
Water Use Surveys/Audits Program (Excluding SFR Participants)	MFR, CII, Ag. & Irr.	Both	--	--	--	--	--	--	--	--	--	49	10	37	26	9	1	6	2	4	2	3	228	362	558	317	463	311	504	504	364	415	128	125	71	22	**4,521**	**58%**
Water Waste Report Program	SFR, CII	Both	--	--	--	--	--	--	--	--	--	--	--	--	6	--	46	16	127	99	41	18	33	80	52	42	33	67	52	68	584	541	190	142	162	151	**2,550**	**4.4%**
Water-wise Community Garden Program	CII, Ag. & Irr.	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22	--	--	**22**	**0.40%**
Total Turf Removed (sq ft)																																						
SFR Turf Removal Program (Turf Removed)	SFR	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10,364	45,348	--	--	--	**55,712**	**--**
WBIC Stations Rebated																																						
SFR WBIC Rebate Program (Station Rebated) (f)	SFR	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	20	719	394	--	--	--	--	**1,133**	**--**
Large Landscape WBIC Rebate Program (Station Rebated) (f)	Ag. & Irr.	Outdoor	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	191	123	--	--	--	--	**314**	**--**

Table 5-2
Summary of Conservation Program Participation
Marin Municipal Water District

Abbreviations

Ag. & Irr. = Agricultural & Irrigation
CII = Commercial, Industrial, and Institutional
HECW = High Efficiency Clothes Washer
HET = High Efficiency Toilet
MFR = multi-family residential
Pct. = Percentage
SFR = Single-family residential
sq ft = Square feet
ULFT = Ultra Low Flow Toilet
WBIC = Weather-Based Irrigation Controller

Notes

(a) Each record provided in the sources below is assumed to be one participant. However, some customers may have participated multiple times, but program records do not include sufficient detail to identify this.
(a) Predominant sector for program participants.
(b) Participation is calculated as a percentage of total accounts of the predominant sector indicated.
(c) Indicated program will be included in detailed program analysis.
(d) Three participant records did not incude date and name; thus, they were not included herein.
(e) Only residential washer models are qualified for rebate (i.e. no coin op models).
(f) Number of WBIC rebates shown is based on the number of active valve stations.
(g) Colored shading is added for visualization purposes. Green shading represents higher participation values.

Table 5-3
Summary of Conservation School Education Program Participation
Marin Municipal Water District

Activity	Number of Students Reached by School Year (a)													
	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	Total
Assembly	1,175	2,967	5,942	5,138	6,955	6,962	7,418	6,161	6,890	6,127	6,579	8,122	3,690	**74,126**
BF Garden Registration	--	0	--	--	--	--	--	--	--	--	--	--	--	**0**
BF School Garden Registration	0	--	--	--	--	--	--	--	--	--	--	--	--	**0**
Bus Transportation Paid	--	--	92	75	50	--	218	242	--	--	--	--	--	**677**
Bus Transportation Pending	--	--	56	--	--	--	--	--	--	--	--	--	--	**56**
Event (Staffing)	--	--	90	824	172	120	85	610	330	830	1,250	250	--	**4,561**
Event (Support)	--	--	--	0	--	--	--	--	--	--	--	--	--	**0**
Field Trip (LHS)	--	1,151	--	--	--	--	--	--	--	--	--	--	--	**1,151**
Flyer/Material Distribution	--	--	4,951	2,324	1,344	1,052	--	--	--	--	--	--	--	**9,671**
Hands-on Student Activities	900	--	122	--	--	--	--	--	--	--	--	--	--	**1,022**
Other	--	--	1	--	--	--	--	--	--	--	1	--	--	**2**
Presentation (Classroom)	2,561	372	332	529	731	504	727	550	539	502	834	554	138	**8,873**
Presentation (Misc)	--	40	37	0	0	23	22	--	52	11	11	--	--	**196**
Presentation (Pre-Field Trip)	--	--	936	631	778	834	--	--	--	--	--	--	--	**3,179**
Restoration Field Trip	--	--	768	552	890	558	--	--	--	--	--	--	--	**2,768**
School Garden Grants	--	500	--	--	--	--	--	--	--	--	--	--	--	**500**
Student Projects	25	10	--	--	--	--	--	--	--	--	--	--	--	**35**
Teacher Workshop	1,500	0	--	--	--	--	--	--	--	--	--	--	--	**1,500**
Technical Garden Support	--	0	--	--	--	--	--	--	--	--	--	--	--	**0**
Water Walk Field Trip	--	--	--	149	190	169	285	443	456	338	481	130	66	**2,707**
Total	**6,161**	**5,040**	**13,327**	**10,222**	**11,110**	**10,222**	**8,755**	**8,006**	**8,267**	**7,808**	**9,156**	**9,056**	**3,894**	**111,024**

Table 5-3
Summary of Conservation School Education Program Participation
Marin Municipal Water District

Abbreviations

BF = Bay-Friendly
LHS = Lawrence Hall of Science
Misc = miscellaneous

Notes

(a) School education program participation is presented by number of students reached, per Marin Municipal Water District, 2020. School year is assumed to start in September and end in August.
(b) Colored shading is added for visualization purposes. Green shading represents higher participation values.

Source

Marin Municipal Water District, 2020. School Education.xlsx, provided by MMWD on 1 April 2020.

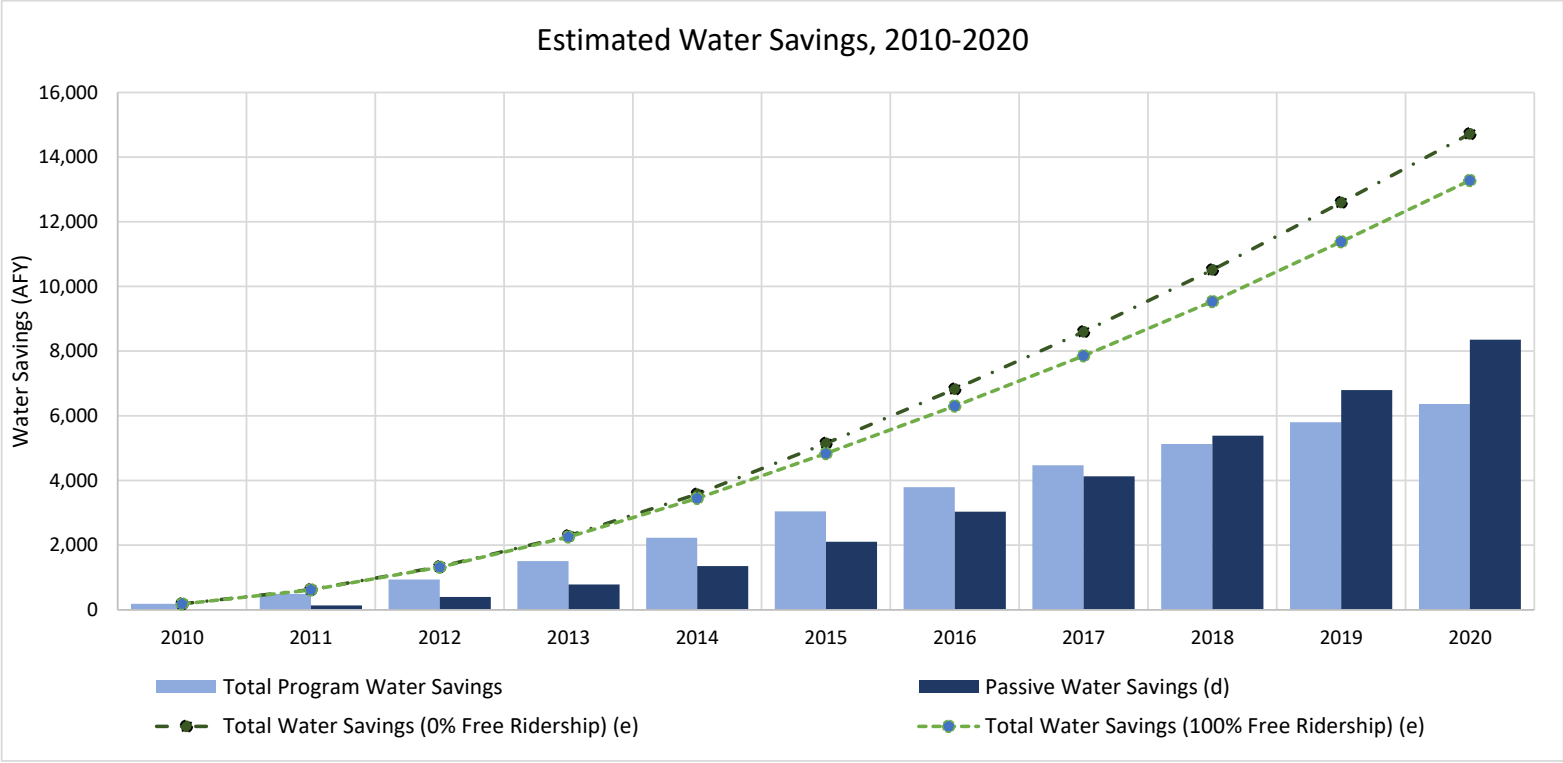
Table 5-4

Estimated Water Savings Achieved by Conservation Programs and Passive Savings

Marin Municipal Water District

Water Saving Type	End Use		Estimated Cumulative Water Savings (AFY) (b)										
	Sector (a)	Indoor/ Outdoor	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Conservation Programs (c)													
AMI Leak Notifications Program	SFR, CII, Ag. & Irr.	Both	0	0	0	0	0	0	0	0	61	229	396
CII Water Use Evaluation Program	CII	Both	19	59	110	165	220	268	307	343	370	389	401
HET Rebate Program	SFR	Indoor	1.5	3.0	4.4	12	59	148	263	397	553	719	880
HET Direct Install Program	MFR, CII	Indoor	1.8	3.5	5.1	19	74	174	270	363	453	540	625
Hot Water Recirculating System	SFR	Outdoor	0	0	0	0	0.06	1.0	2.1	3.3	4.7	6.1	7.5
Irrigation Improvement Equipment Program	Ag. & Irr.	Outdoor	0	0	0	0	0	0.52	1.2	2.4	3.5	4.6	5.7
Large Landscape WBIC Rebate Program	Ag. & Irr.	Outdoor	0	0	0	0	0	1.5	4.7	8.0	11	15	18
Laundry-to-Landscape System	SFR	Outdoor	0	0	0	0	0	0.21	0.44	0.76	1.1	1.4	1.7
Organic Mulch Rebate Program	SFR	Outdoor	0	0	0	0	0	0.04	0.07	0.12	0.17	0.22	0.27
Pool Cover Rebate Program	SFR	Outdoor	0	0	0	0	0.21	3.3	7.3	12	16	21	22
Rain Barrel Rebate Program	SFR	Outdoor	0	0	0	0	0	0.11	0.22	0.34	0.5	0.6	0.7
Residential HECW Rebate Program	SFR	Indoor	3.3	6.4	9.4	14	27	47	72	99	124	149	172
SFR Turf Removal Program	SFR	Outdoor	0	0	0	0	0	0.38	2.4	4.5	6.5	9	11
SFR Water Use Surveys/Audits Program	SFR	Both	27	90	173	272	390	508	607	703	787	850	891
SFR WBIC Rebate Program	SFR	Outdoor	0	0	0	0	3.7	10	15	21	27	33	39
Water Use Surveys/Audits Program (Excluding SFR Participants)	MFR, CII, Ag. & Irr.	Both	133	328	630	1,015	1,428	1,834	2,166	2,420	2,597	2,710	2,761
Water Waste Report Program	SFR, CII	Both	0.70	2.7	5.4	9.0	24	48	70	91	110	125	133
Water-wise Community Garden Program	CII, Ag. & Irr.	Outdoor	0	0	0	0	0	0	0	0.38	0.76	1.1	1.5
Total Program Water Savings			*185*	*493*	*937*	*1,506*	*2,226*	*3,043*	*3,790*	*4,468*	*5,126*	*5,801*	*6,366*
Passive Water Savings (d)			*0*	*135*	*398*	*785*	*1,351*	*2,106*	*3,035*	*4,128*	*5,384*	*6,794*	*8,352*
Total Water Savings (100% Free Ridership) (e)			**180**	**617**	**1,320**	**2,254**	**3,444**	**4,834**	**6,302**	**7,853**	**9,533**	**11,380**	**13,277**
Total Water Savings (0% Free Ridership) (e)			**185**	**628**	**1,336**	**2,290**	**3,577**	**5,149**	**6,824**	**8,596**	**10,510**	**12,595**	**14,718**

Table 5-4
Estimated Water Savings Achieved by Conservation Programs and Passive Savings
Marin Municipal Water District



Abbreviations

Ag. & Irr. = Agricultural & Irrigation
CII = Commercial, Industrial, and Institutional
HECW = High Efficiency Clothes Washer
HET = High Efficiency Toilet
MFR = multi-family residential
SFR = single-family residential
WBIC = weather-based irrigation controller

Table 5-4

Estimated Water Savings Achieved by Conservation Programs and Passive Savings

Marin Municipal Water District

Notes

(a) Predominant sector for program participants.

(b) Water savings are estimated per the AWE model.

(c) The water savings associated with the landscape plan review program and the tier 4 exemption program are estimated as a part of passive savings. Additional programs with participation prior to 2010 are not included herein.

(d) Passive water savings are water savings associated with the natural change out of water using fixtures and devices with higher efficiency ones, due to plumbing code and market changes. Passive savings are estimated for the whole service area.

(e) Free ridership refers to customers who participate in a conservation program, but who would have taken the water saving action (e.g., replace a toilet) regardless of whether the conservation program incentive was available. The amount of free ridership is unknown, and thus a range is shown. Free ridership is applied to device, hot water recirculation systems, turf replacement, and other irrigation equipment programs only.

Sources

1. Marin Municipal Water District, 2020. Program Participation Data, provided by Marin Municipal Water District on 1 April 2020 and 16 June 2020.

Table 5-6a
Estimated Water Savings Achieved by the AMI Leak Notifications Program
Marin Municipal Water District

Year	Number of Participants (a)	Average Water Use Reduction (b)		Estimated Savings due to Program (d) (gal/acct/yr)
		Participant Group (gal/yr)	Cohort Group (c) (gal/yr)	
2018	62	15,291	-13,732	29,023
Total	**62**	**--**	**--**	**--**
Avg (e)	**--**	**15,291**	**-13,732**	**29,023**

Abbreviations:

avg = average
gal/acct/yr = gallons per account per year
gal/yr = gallons per year
MFR = multi-family residential
SFR = single family residential
-- = not applicable

Notes:

(a) Program participants included in this analysis are limited to those that: (1) have only participated in the specified program, (2) have only participated in the program in the specified year, and (3) have sufficient water use data within the study periods.
(b) A negative value indicates that average water use increased following program participation.
(c) Customers included in the comparison cohort groups are limited to those that: (1) have not participated in any water efficiency program based on available data and (2) have sufficient water use data within the study periods.
(d) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts. Water savings comparison cohorts for SFR and MFR customers are stratified geographically based on Census Block Groups. Cohorts for participants in other sectors are stratified by sector only.
(e) The estimated savings are the weighted average based on the number of participants. Water use reduction averages are not weighted.

Sources:

1. Marin Municipal Water District, 2020. Customer Billing History, provided by Marin Municipal Water District on 9 July 2020.

Table 5-6b
Estimated Water Savings Achieved by the Residential HECW Rebate Program
Marin Municipal Water District

Year	Number of Participants (a)	Total HECW Rebated (unit)	Total Rebate Amount ($)	Average Water Use Reduction (b)		Estimated Savings due to Program (d) (gal/acct/yr)	Estimated Unit Savings (gal/yr/unit)
				Participant Group (gal/yr)	Cohort Group (c) (gal/yr)		
2013	68	68	$3,400	11,985	6,905	5,080	5,080
2014	354	355	$17,750	16,344	11,441	4,904	4,890
2015	315	315	$28,150	11,402	8,680	2,723	2,723
2016	186	186	$27,900	5,852	2,356	3,496	3,496
2017	84	84	$12,600	2,545	-4,824	7,369	7,369
2018	24	24	$3,600	2,068	-6,486	8,553	8,553
Total	**1,031**	**1,032**	**$93,400**	--	--	--	--
Avg (e)	--	--	--	**8,366**	**3,012**	**4,281**	**4,276**

Abbreviations:

avg = average
gal/acct/yr = gallons per account per year
gal/yr = gallons per year
gal/yr/unit = gallons per year per unit device rebated
HECW = high efficiency clothes washer
MFR = multi-family residential
SFR = single family residential
-- = not applicable

Notes:

(a) Program participants included in this analysis are limited to those that: (1) have only participated in the specified program, (2) have only participated in the program in the specified year, and (3) have sufficient water use data within the study periods.
(b) A negative value indicates that average water use increased following program participation.
(c) Customers included in the comparison cohort groups are limited to those that: (1) have not participated in any water efficiency program based on available data and (2) have sufficient water use data within the study periods.
(d) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts. Water savings comparison cohorts for SFR and MFR customers are stratified geographically based on Census Block Groups. Cohorts for participants in other sectors are stratified by sector only.
(e) The estimated savings are the weighted averages based on the number of participants. Water use reduction averages are not weighted.

Sources:

1. Marin Municipal Water District, 2020. Customer Billing History, provided by Marin Municipal Water District on 9 July 2020.

Table 5-6c
Estimated Water Savings Achieved by the SFR Water Use Surveys/Audits Program
Marin Municipal Water District

Year	Number of Participants (a)	Average Water Use Reduction (b)		Estimated Savings due to Program (d) (gal/acct/yr)
		Participant Group (gal/yr)	Cohort Group (c) (gal/yr)	
2013	311	14,784	7,320	7,464
2014	346	18,632	11,006	7,627
2015	299	16,028	8,114	7,914
2016	210	8,473	1,782	6,690
2017	311	-4,120	-5,694	1,574
2018	205	379	-6,112	6,491
Total	**1,682**	**--**	**--**	**--**
Avg (e)	**--**	**9,029**	**2,736**	**6,273 (f)**

Abbreviations:

avg = average
gal/acct/yr = gallons per account per year
gal/yr = gallons per year
MFR = multi-family residential
MMWD = Marin Municipal Water District
SFR = single family residential
-- = not applicable

Notes:

(a) Program participants included in this analysis are limited to those that: (1) have only participated in the specified program, (2) have only participated in the program in the specified year, and (3) have sufficient water use data within the study periods. It is noted that participants was not limited to SFR customers.
(b) A negative value indicates that average water use increased following program participation.
(c) Customers included in the comparison cohort groups are limited to those that: (1) have not participated in any water efficiency program based on available data and (2) have sufficient water use data within the study periods.
(d) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts. Water savings comparison cohorts for SFR and MFR customers are stratified geographically based on Census Block Groups. Cohorts for participants in other sectors are stratified by sector only.
(e) The estimated savings are the weighted average based on the number of participants. Water use reduction averages are not weighted.
(f) MMWD often promoted rebates to SFR customers during the water use survey. As such, it is likely that many customers also participated in rebate programs, which eliminated them from the participant group. The participants who did not follow up with the rebate programs might have different water use habits than those who did. Thus, the estimated savings presented here is different than the expected value.

Sources:

1. Marin Municipal Water District, 2020. Customer Billing History, provided by Marin Municipal Water District on 9 July 2020.

Table 5-6d
Estimated Water Savings Achieved by the SFR WBIC Rebate Program
Marin Municipal Water District

Year	Number of Participants (a)	Total WBIC Rebated (unit)	Total WBIC Station (station)	Total Rebate Amount ($)	Average Water Use Reduction (b)		Estimated Savings due to Program (d) (gal/acct/yr)	Estimated Unit Savings	
					Participant Group (gal/yr)	Cohort Group (c) (gal/yr)		(gal/yr/WBIC)	(gal/yr/station)
2014	66	66	719	$12,937	27,226	11,131	16,095	16,095	1,477
2015	42	42	394	$7,676	27,387	8,303	19,084	19,084	2,034
Total	**108**	**108**	**1,113**	**$20,613**	--	--	--	--	--
Avg (e)	--	--	--	--	**27,307**	**9,717**	**17,258**	**17,258**	**1,694**

Abbreviations:

avg = average
gal/acct/yr = gallons per account per year
gal/yr = gallons per year
gal/yr/WBIC = gallons per year per WBIC rebated
gal/yr/station = gallons per year per WBIC station
SFR = single family residential
WBIC = weather-based irrigation controller
-- = not applicable

Notes:

(a) Program participants included in this analysis are limited to those that have sufficient water use data within the study periods. All the participants have participated in more than one conservation program, thus the analysis is not limited to those that only participated in this program.
(b) A negative value indicates that average water use increased following program participation.
(c) Customers included in the comparison cohort groups are limited to those that: (1) have not participated in any water efficiency program based on available data and (2) have sufficient water use data within the study periods.
(d) Estimated annual water savings associated with the program are calculated as the incremental amount of water saved by the program participants over that of the comparison cohort accounts. Water savings comparison cohorts for SFR customers are stratified geographically based on Census Block Groups.
(e) The estimated savings are the weighted averages based on the number of participants. Water use reduction averages are not weighted.

Sources:

1. Marin Municipal Water District, 2020. Customer Billing History, provided by Marin Municipal Water District on 9 July 2020.

Table 5-7
Building Stock Characteristics by Program Participants
Marin Municipal Water District

Water Efficiency Program (a)	Sector (b)	Avg Year Built	Avg Lot Size (sq ft)	Avg Lot Size (ac)	Year of Construction		
					pre-1994	1994-2009	2010 and Later
AMI Leak Notifications Program	SFR	1987	24,291	0.56	64%	33%	2.7%
	CII	1957	479,819	11	100%	0%	0%
	Irrig.	1973	953,284	22	93%	7.5%	0%
Rain Barrel Rebate Program	SFR	1971	11,669	0.27	91%	9.0%	0%
Residential HECW Rebate Program	SFR	1975	13,834	0.32	84%	15%	0.67%
	MFR	1979	47,317	1.1	89%	11%	0.24%
	CII	1954	118,839	2.7	95%	1.3%	3.9%
SFR Water Use Surveys/Audits Program	SFR	1977	19,155	0.44	81%	18%	0.99%
SFR WBIC Rebate Program	SFR	1978	20,113	0.46	81%	19%	0%

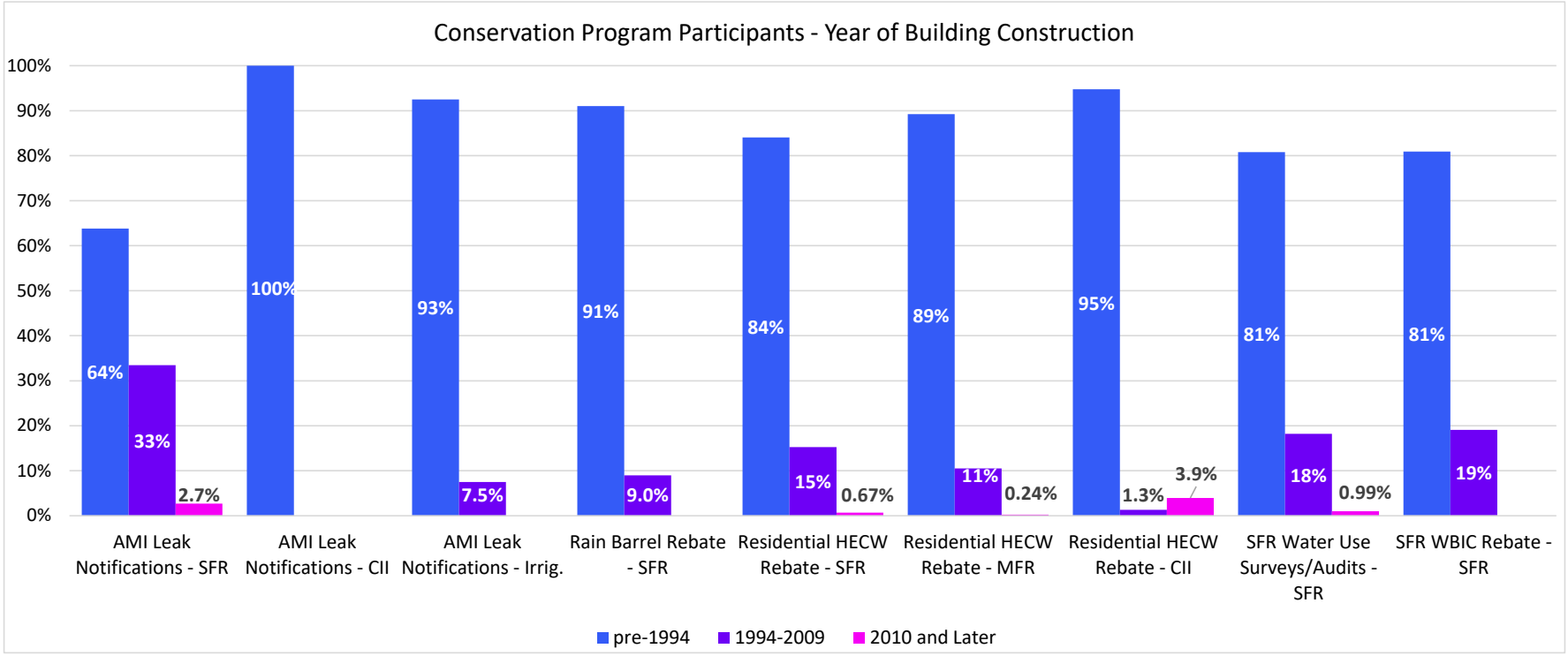


Table 5-7
Building Stock Characteristics by Program Participants
Marin Municipal Water District

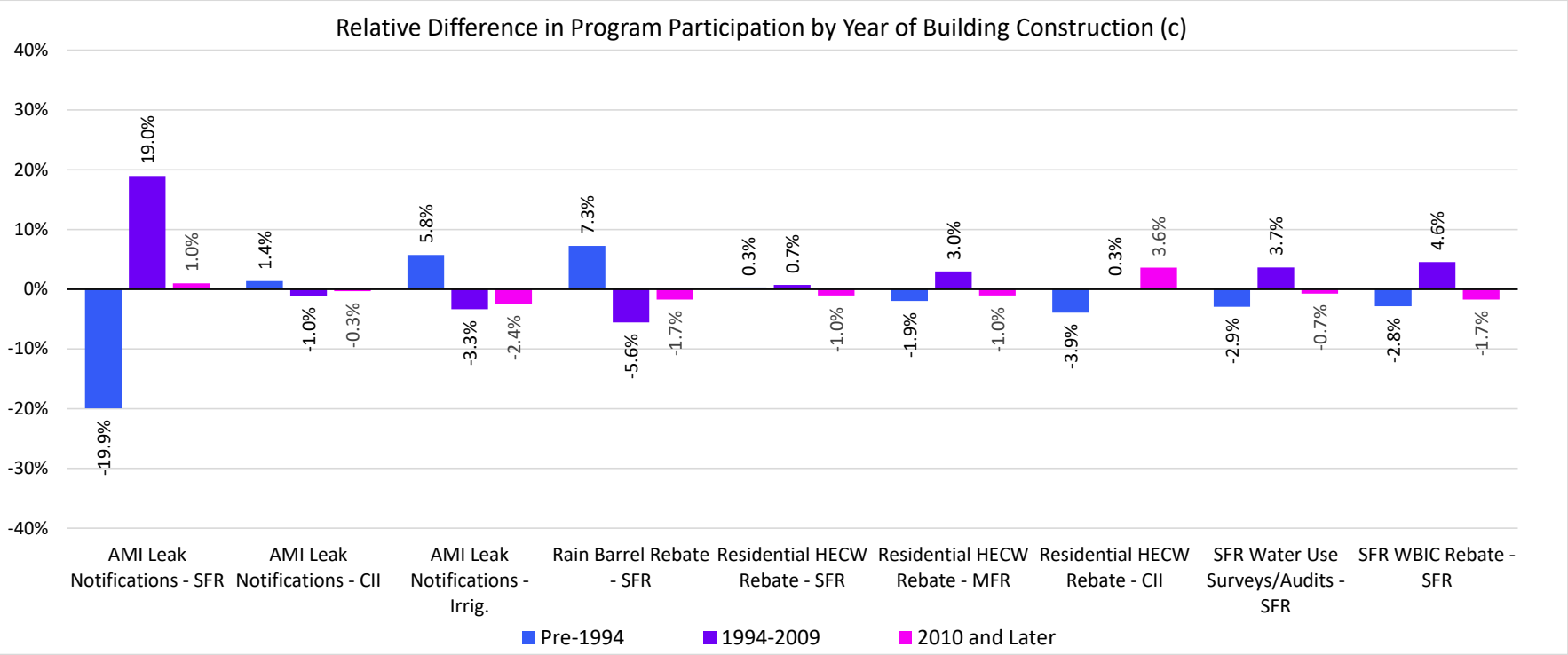


Table 5-7
Building Stock Characteristics by Program Participants
Marin Municipal Water District

Abbreviations:

ac = acre
avg = average
CII = commercial, industrial, and institutional
Irrig. = Irrigation
HECW = High Rfficiency Clothes Washer
MFR = multi-family residential
SFR = single family residential
sq ft = square feet

Notes:

(a) Program participants included in this analysis are limited to those for which relevant parcel data are available. The analysis is also limited to sectors with more than 50 participants in a given program.
(b) Program participants in the business / industrial and institutional sectors are grouped as "CII", and participants in the agricultural / irrigation sector are presented as "Irrig." in this analysis.
(c) Relative difference is calculated as the percentage of program participation by year of construction minus the overall percentage of residential customers by year of construction within the service area.

Sources:

1. Marin County, 2020. Sonoma county Assessor Parcel Data, provided via Marin Municipal Water District, 13 February 2020.

Table 5-8a
Residential Customer Program Participation by Median Household Income
Marin Municipal Water District

Median Household Income (a)		Percentage of Residential Customers in MMWD (b)	Percentage of Participating Residential Customers (b)				
			AMI Leak Notifications Program	Rain Barrel Rebate Program	Residential HECW Rebate Program	SFR Water Use Surveys/Audits Program	SFR WBIC Rebate Program
Low Income	<$94,850	20%	0.78%	19%	18%	15%	13%
Moderate Income	$94,850 - $124,500	26%	33%	28%	26%	25%	23%
High Income	>$124,500	54%	66%	53%	57%	59%	65%

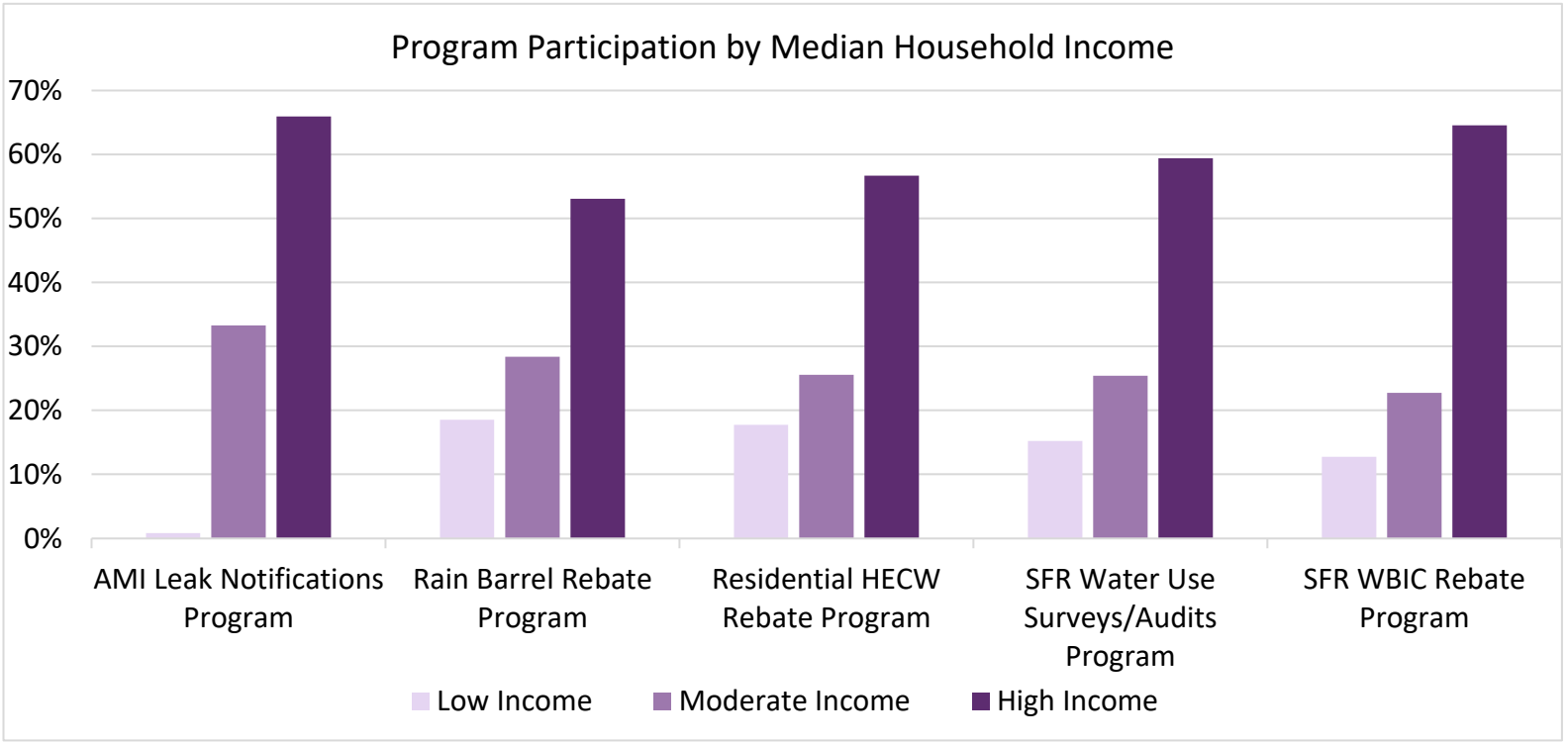
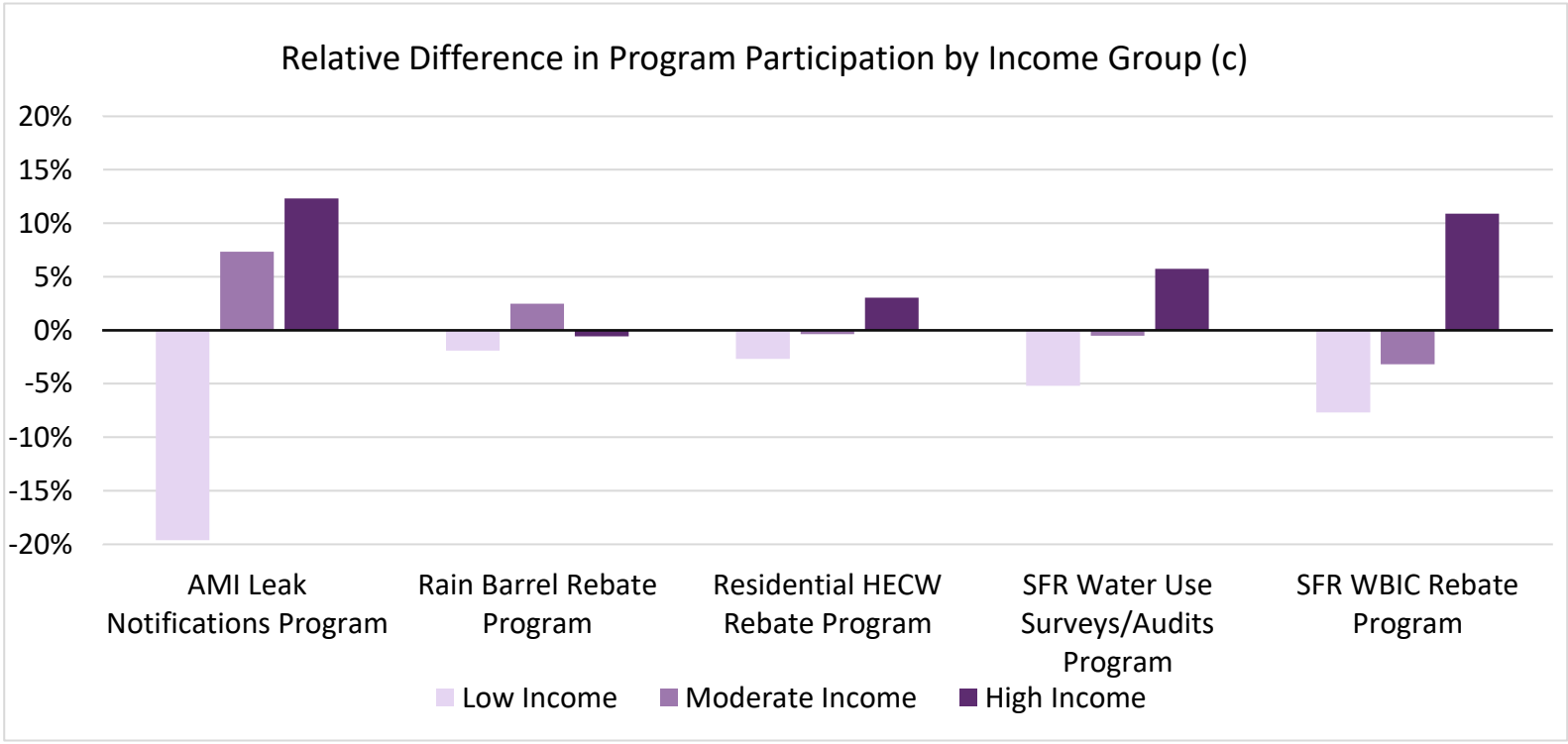


Table 5-8a
Residential Customer Program Participation by Median Household Income
Marin Municipal Water District



Abbreviations:

AMI = Advanced Metering Infrastructure
HECW = High Efficiency Clothes Washer
HUD = United States Department of Housing and Urban Development
MMWD = Marin Municipal Water District
SFR = single family residential
WBIC = weather-based irrigation controller

Table 5-8a
Residential Customer Program Participation by Median Household Income
Marin Municipal Water District

Notes:
(a) Household income is based on estimated 2017 median household income by Census Block Group, per Census (2019). Income level groupings are based on California Department of Housing and Community Development (HCD) income levels for Marin County for a 3-person household in 2017 (HCD, 2017). The average persons per household is 2.4 for Marin County, based on Census data.
(b) Residential customers include both single-family and multi-family customers. Participants included in this analysis are limited to those for which location data are available.
(c) Relative difference is calculated as the percentage of program participation by income group minus the overall percentage of residential customers by income group within the service area.

References:
1. Census, 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau, downloaded on 14 January 2020.
2. HCD, 2017. Memorandum: State Income Limits for 2017, California Department of Housing and Community Development, dated June 9, 2017.

Table 5-8b
Residential Customer Program Participation by Percentage of Renters
Marin Municipal Water District

Percentage of Renters (a)		Percentage of Residential Customers in MMWD (b)	Percentage of Participating Residential Customers (b)				
			AMI Leak Notifications Program	Rain Barrel Rebate Program	Residential HECW Rebate Program	SFR Water Use Surveys/Audits Program	SFR WBIC Rebate Program
Low Rentership	≤25%	48%	51%	56%	52%	53%	55%
Low to Moderate Rentership	25.1%-50%	34%	48%	34%	34%	34%	36%
Moderate to High Rentership	50.1%-75%	16%	1.1%	9.3%	13%	12%	8.2%
High Rentership	≥75%	2.0%	0.11%	0.62%	1.0%	0.84%	0%

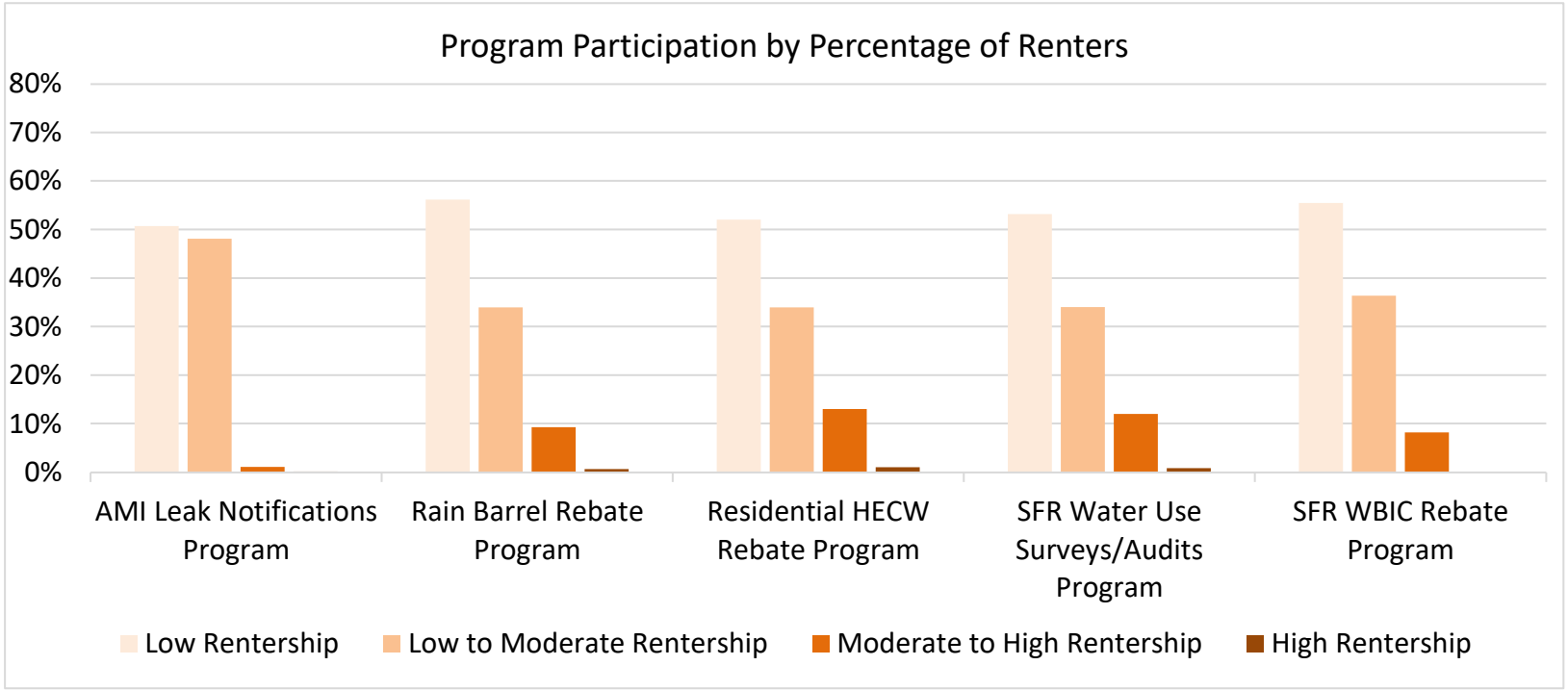
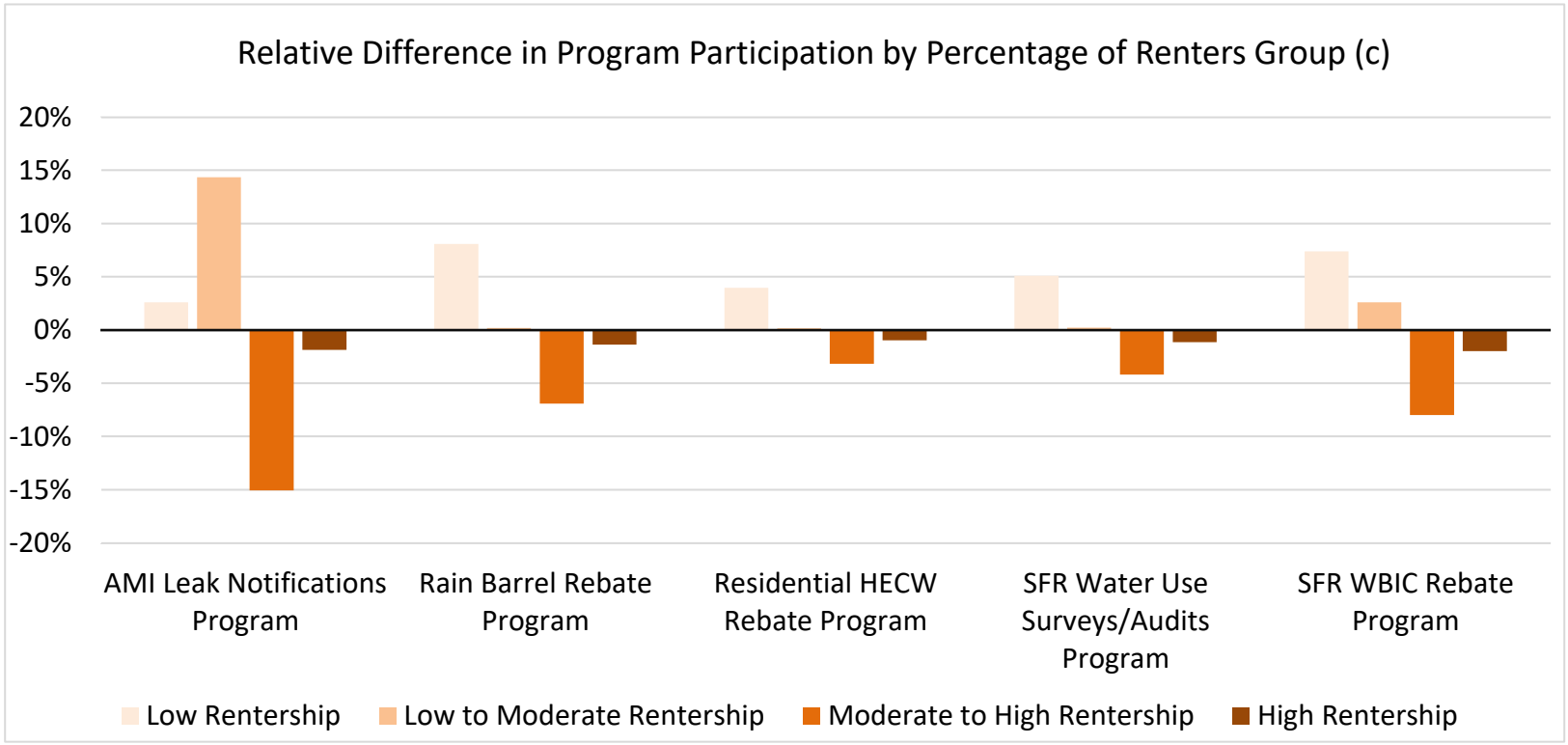


Table 5-8b
Residential Customer Program Participation by Percentage of Renters
Marin Municipal Water District



Abbreviations:

AMI = Advanced Metering Infrastructure
HECW = High Efficiency Clothes Washer
MMWD = Marin Municipal Water District
SFR = single family residential
WBIC = weather-based irrigation controller

Table 5-8b
Residential Customer Program Participation by Percentage of Renters
Marin Municipal Water District

Notes:

(a) Percent rentership reflects the proportion of population within a given Census Block Group that lives in renter-occupied homes. Low rentership indicates an area consists predominantly of owner-occupied homes; high rentership indicates an area consists predominantly of renter-occupied homes. Rentership is based on estimated percentage of rentership by Census Block Group, per Census (2019).

(b) Residential customers include both single-family and multi-family customers. Participants included in this analysis are limited to those for which location data are available.

(c) Relative difference is calculated as the percentage of program participation by percent of renters group minus the overall percentage of residential customers by percent of renters group within the service area.

References:

1. Census, 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau, downloaded on 14 January 2020.

Table 5-8c
Residential Customer Program Participation by Median Household Age
Marin Municipal Water District

Median Household Age (a)	Percentage of Residential Customers in MMWD (b)	Percentage of Participating Residential Customers (b)				
		AMI Leak Notifications Program	Rain Barrel Rebate Program	Residential HECW Rebate Program	SFR Water Use Surveys/Audits Program	SFR WBIC Rebate Program
<35 Years	1.6%	0.11%	1.2%	0.97%	0.92%	0%
35-45 Years	27%	15%	23%	27%	23%	30%
45-55 Years	57%	51%	64%	58%	58%	55%
>55 Years	14%	34%	12%	14%	17%	15%

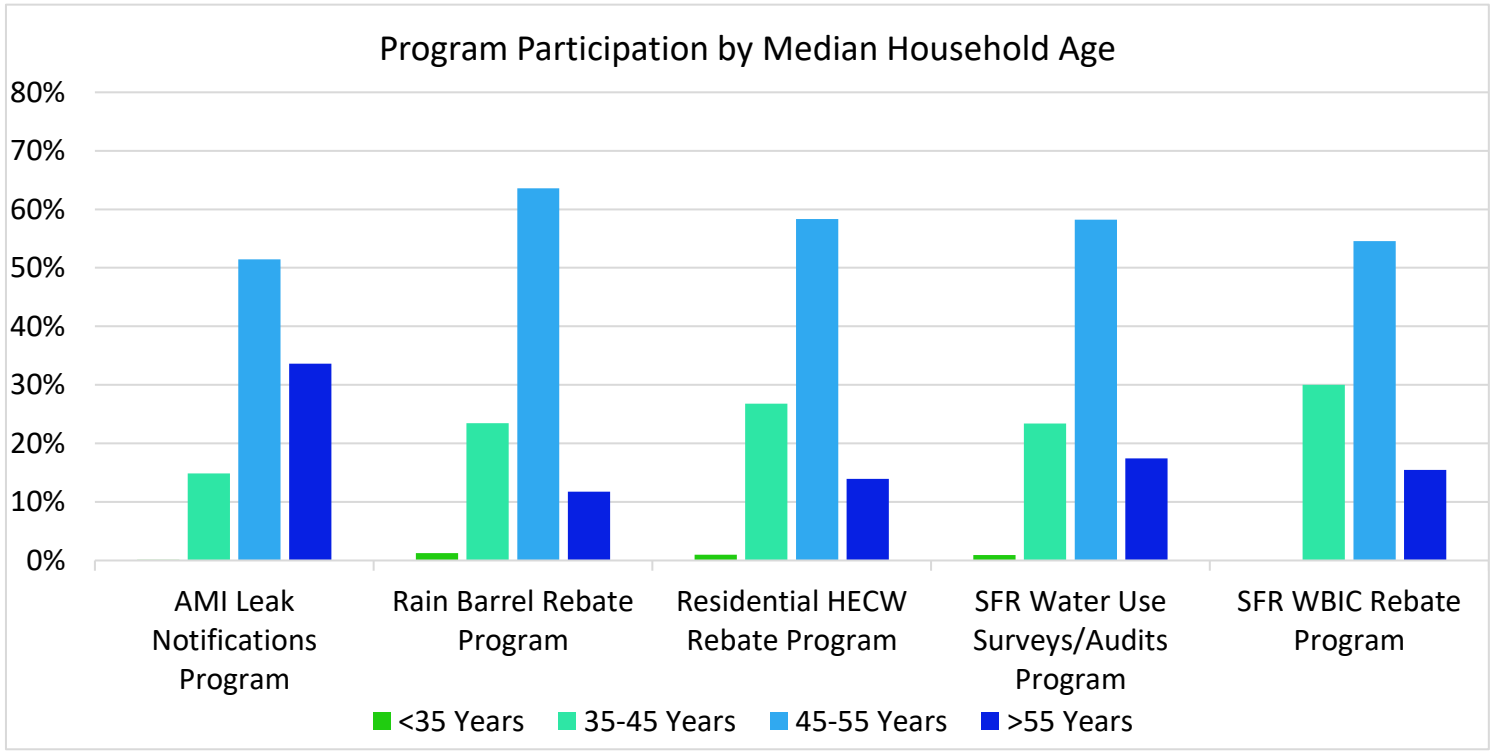
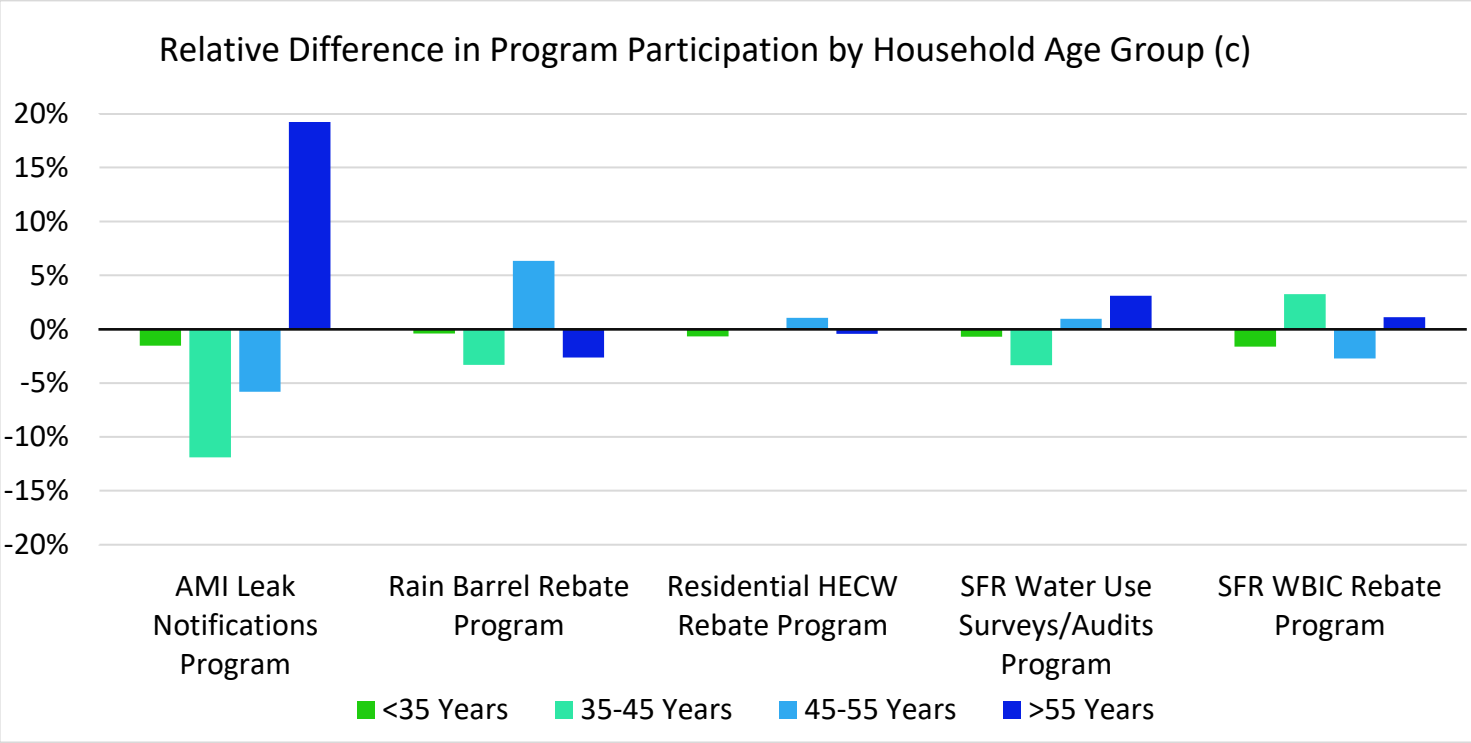


Table 5-8c
Residential Customer Program Participation by Median Household Age
Marin Municipal Water District



Abbreviations:

AMI = Advanced Metering Infrastructure
HECW = High Efficiency Clothes Washer
MMWD = Marin Municipal Water District
SFR = single family residential
WBIC = weather-based irrigation controller

Table 5-8c
Residential Customer Program Participation by Median Household Age
Marin Municipal Water District

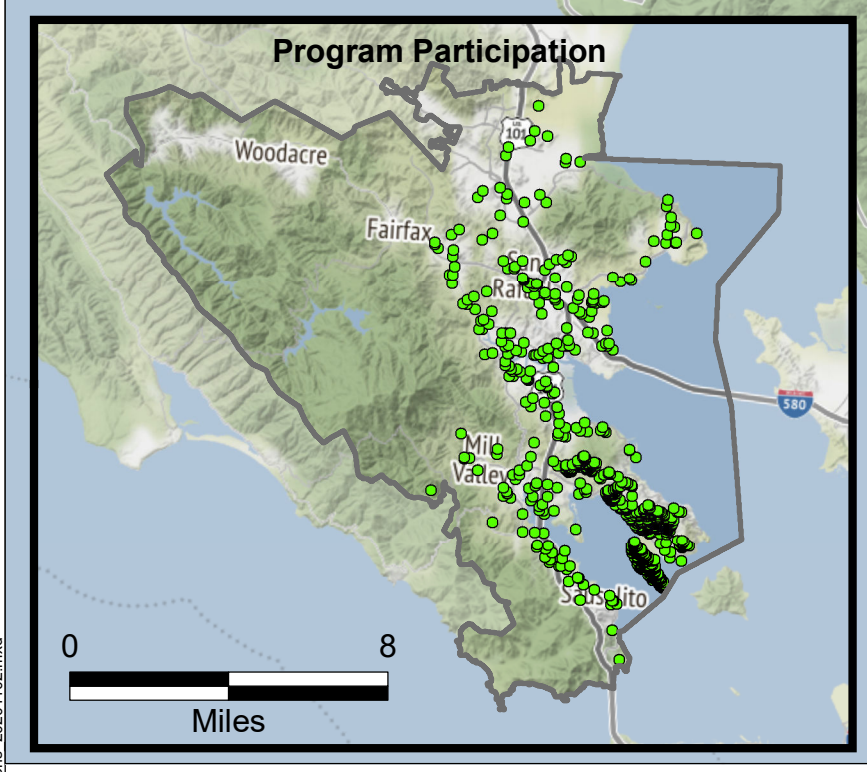
Notes:

(a) Median household age is based on the estimated median age of household members by Census Block Group, per Census (2019).
(b) Residential customers include both single-family and multi-family customers. Participants included in this analysis are limited to those for which location data are available.
(c) Relative difference is calculated as the percentage of program participation by household age group minus the overall percentage of residential customers by household age group within the service area.

References:

1. Census, 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau, downloaded on 14 January 2020.

Participation Density
AMI Leak Notifications Program
2018 - 2020
1,877 Participants Analyzed



Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program Participation

- AMI Leak Notifications
- Service Area

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.

Sources

1. Water use efficiency program data provided by Marin Municipal Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

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0 1.5 3

Miles

Participation Density for AMI Leak Notifications Program

Marin Municipal Water District
December 2020
C00004.00

Figure 5-1a

eki environment & water

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Participation Density
AMI Leak Notifications Program
2018 - 2019
932 Participants Analyzed

Ring Mountain Open Space Preserve
Horse Hill Open Space Preserve
Strawberry
Tiburon Uplands Nature Preserve
Saint Hilary's Open Space Preserve
Angel Island State Park
Sausalito
Belvedere

Program Participation

0 1.5 3
Miles

Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program Participation

- AMI Leak Notifications Program
- Service Area

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.

Sources

1. Water use efficiency program data provided by Marin Municipal Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

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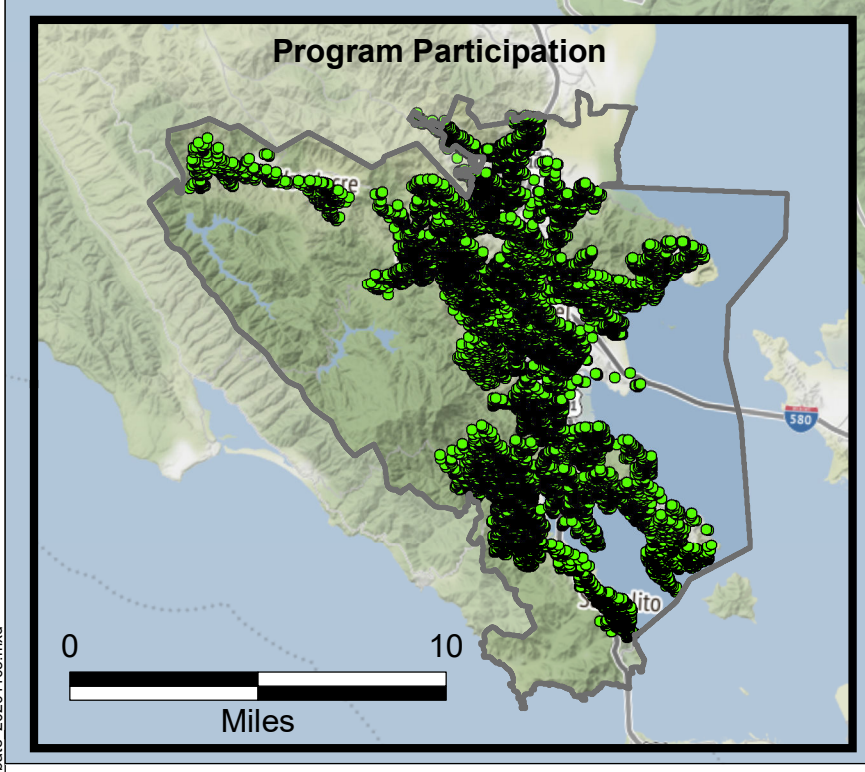
Participation Density for AMI Leak Notifications Program - Belvedere and Tiburon

Marin Municipal Water District
December 2020
C00004.00
Figure 5-1b

eki environment & water

Path: X:\C00004_SonomaMarin\Map\2020112_MMWD\Fig5-1b_MMWD_HotSpot_AMI_Leak_Notifications_Zoom_20201103.mxd

Participation Density
Residential HECW Rebate Program
1998 - 2019
17,311 Participants Analyzed



Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program Participation

- Residential HECW Rebate Program
- Service Area Boundary

Abbreviation

CII = commercial, industrial, and institutional
HECW = high efficiency clothes washer
MFR = multi-family residential
SFR = single family residential

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.
4. The HECW Rebate Program is open to SFR, MFR, and CII customers, but only residential washers are rebated.

Sources

1. Water use efficiency program data provided by Marin Municipal Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

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Miles

Participation Density for Residential HECW Rebate Program

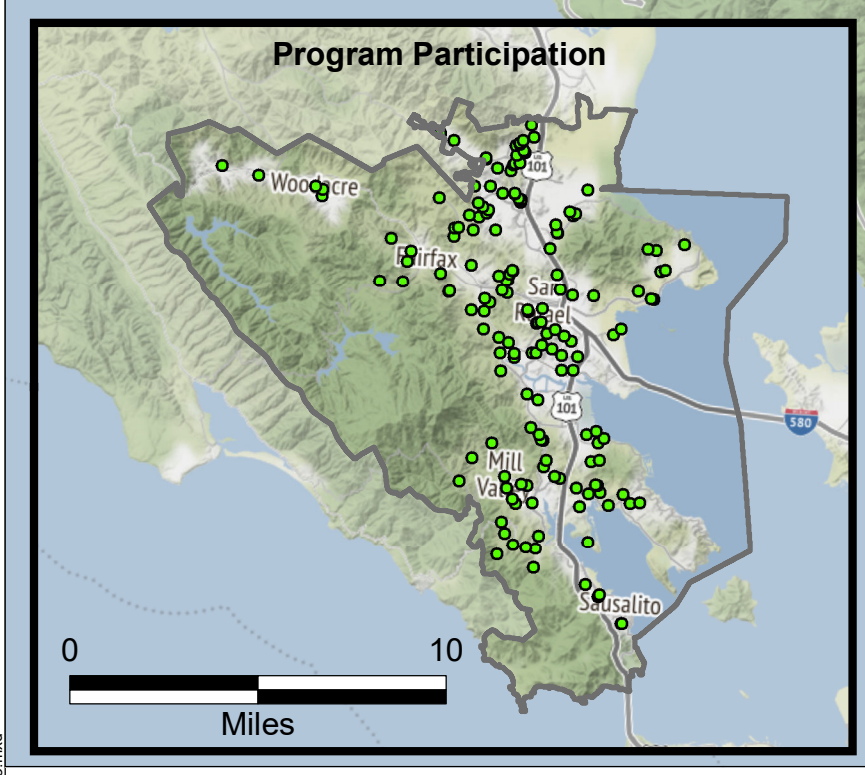
Marin Municipal Water District
December 2020
C00004.00

Figure 5-1c

eki environment & water

Path: X:\C00004 SonomaMarin\Map\2020\12 MMWD\Fig5-1c MMWD HotSpot RES CII HECW Rebate 20201103.mxd

Participation Density
Rain Barrel Rebate Program
2014-2020
162 Participants Analyzed



Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program

- Rain Barrel Rebate
- Service Area

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.

Sources

1. Water use efficiency program data provided by Marin Municipal Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

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Miles

Participation Density for Rain Barrel Rebate Program

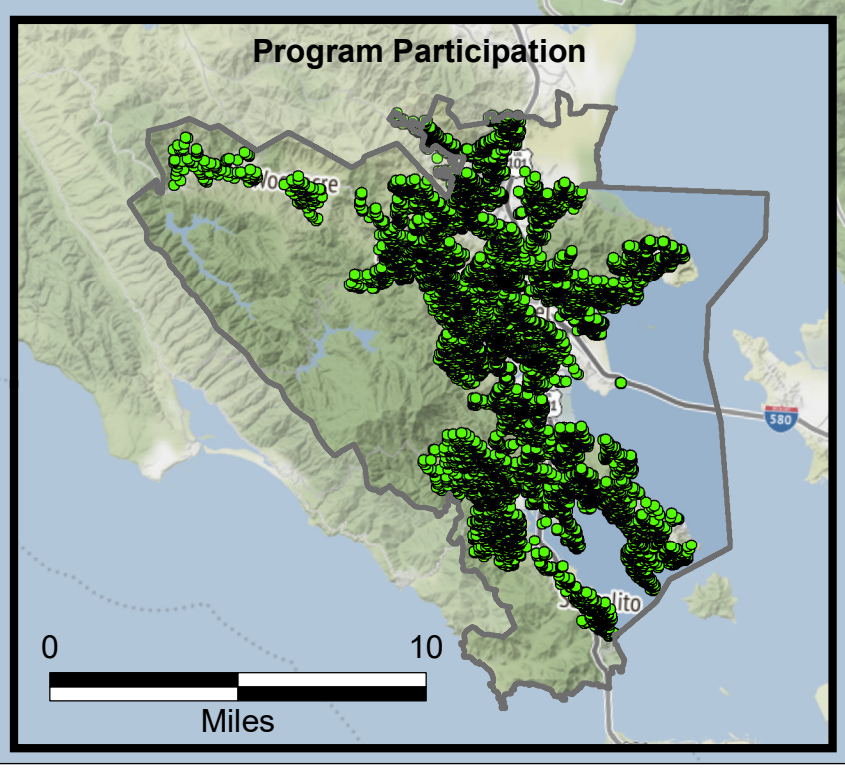
Marin Municipal Water District
December 2020
C00004.00

Figure 5-1d

eki environment & water

Path: X:\C00004 SonomaMarin\Map\2020\12 MMWD\Fig5-1d MMWD HotSpot RainBarrel 20201103.mxd

Participation Density
SFR Water Use Surveys/Audits Program
1995 - 2020
12,833 Participants Analyzed



Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program Participation

- SFR Water Use Surveys/Audits Program
- Service Area Boundary

Abbreviation

SFR = single family residential

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.

Sources

1. Water use efficiency program data provided by Marin Municipal Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

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Miles

Participation Density for SFR Water Use Surveys/Audits Program

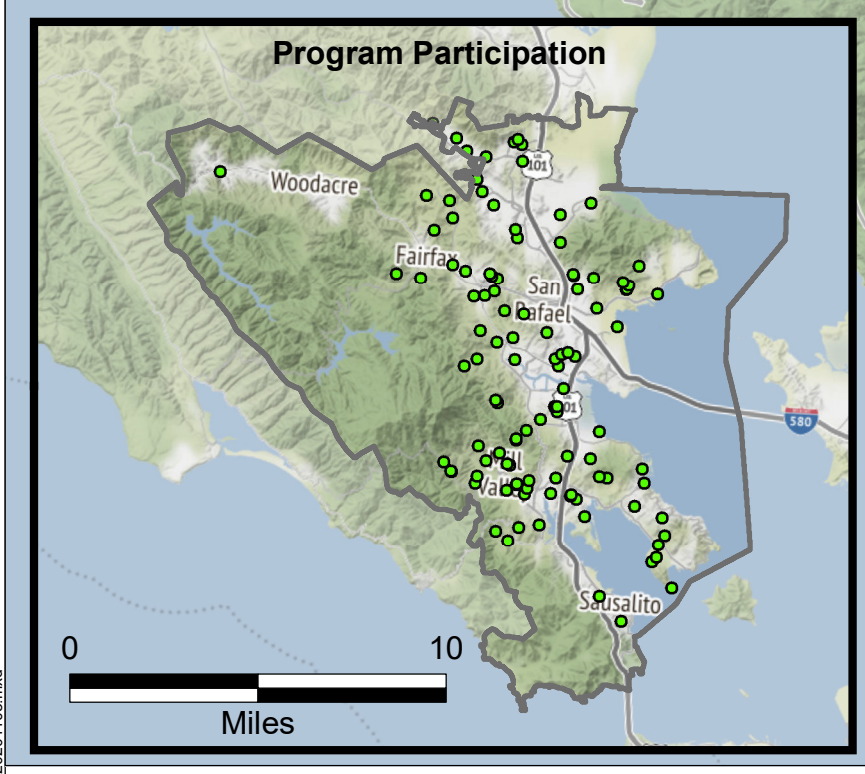
Marin Municipal Water District
December 2020
C00004.00

Figure 5-1e

eki environment & water

Path: X:\C00004_SonomaMarin\Map\20201\2_MMWD\Fig5-1e_MMWD_HotSpot_SFR_WaterUseSurveys_20201103.mxd

Participation Density
SFR WBIC Rebates Program
2013-2015
110 Participants Analyzed



Legend

Participation Hot and Cold Spots

- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Program

- SFR WBIC Rebates
- Service Area

Abbreviation

SFR = single family residential
WBIC = Weather-Based Irrigation Controller

Notes

1. All locations are approximate.
2. Program participation hot and cold spots were evaluated using the Esri ArcGIS 10.8.0 Optimized Hot Spot Analysis tool, which calculates a Getis-Ord GI* statistic. This statistic is a measure of the spatial distribution of incidents (participation) relative to a random, equally-spaced distribution.
3. Participants included in this analysis are limited to those for which detailed participation records and location data are available.

Sources

1. Water use efficiency program data provided by Marin Municipal Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

N
0 1.5 3
Miles

Participation Density for SFR WBIC Rebates Program

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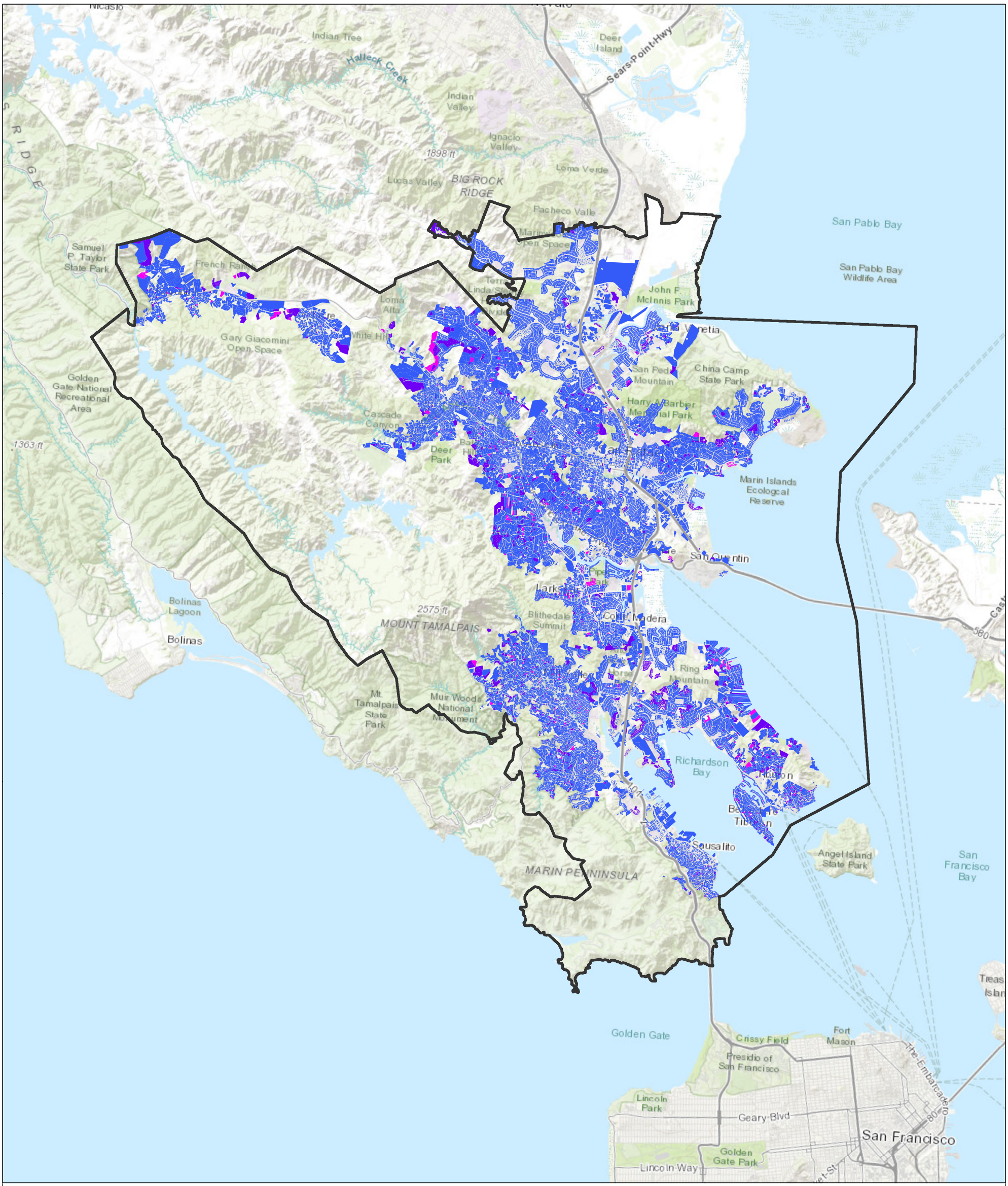
December 2020
C00004.00

Figure 5-1f

Path: X:\C00004 SonomaMarin\Map\2020\12 MMWD\Fig5-1f MMWD HotSpot SFR WBIC Rebate 20201103.mxd



Legend

Service Area Boundary

Year Built

- <1994 (54,743 parcels)
- 1994 - 2009 (3,355 parcels)
- 2010 and newer (826 parcels)

N

0 2 4

Miles

Age of Building Stock

Notes

1. All locations are approximate.
2. Construction date for Marin County parcels is based on year primary building was constructed, per Reference 1.

Sources

1. Marin County, 2020. ConservationJan2020.gdb, provided by Marin Municipal Water District, 13 February 2020.
2. Basemap provided by ESRI.

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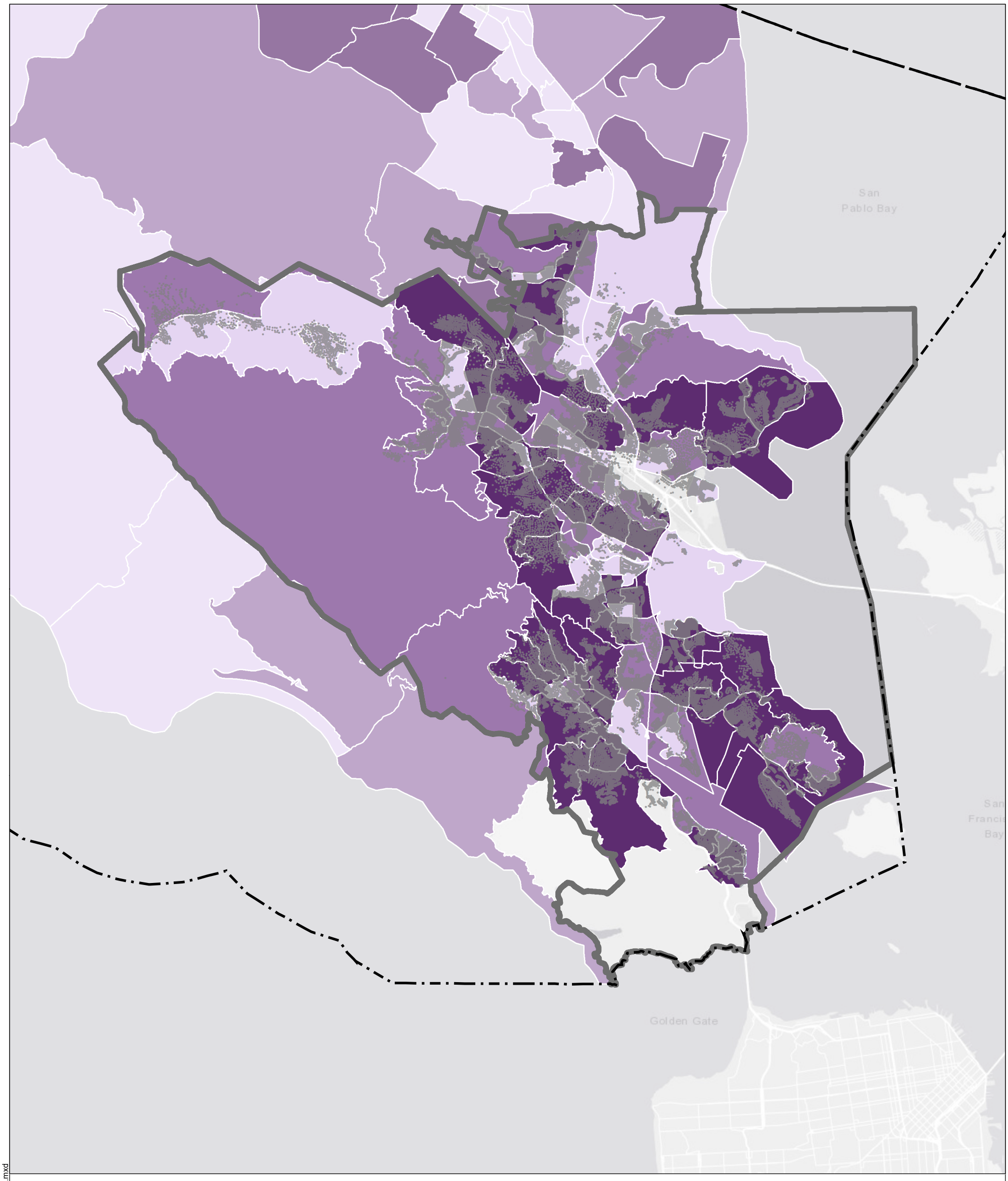
Figure 5-2

Path: X:\C00004 SonomaMarin\Map\2020\12 MMWDFig5-2 MMWD BldgStock 20201030.mxd



Legend

- County Boundary
- Service Area Boundary
- Residential Customers

Median Household Income

- <$94,850 (Low)
- $94,850 - $124,500 (Medium)
- >$124,500 (High)

Sources

1. Census, 2019. 2013-2017 American Community Survey (ACS) 5- ear estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau.
2. HCD, 2017. Memorandum: State Income Limits for 2017, California Department of Housing and Community Development, dated June 9, 2017.
3. Basemap provided by ESRI.

N

0 2 4

Miles

Abbreviations

HUD = Housing and Community Development

Notes

1. All locations are approximate.
2. Household income is based on estimated 2017 median household income by Census Block Group, per Census (2019). Income level groupings are based on California Department of Housing and Community Development (HCD) income levels for Marin County for a 3-person household in 2017 (HCD, 2017). The average persons per household is 2.4 for Marin County.

Median Household Income

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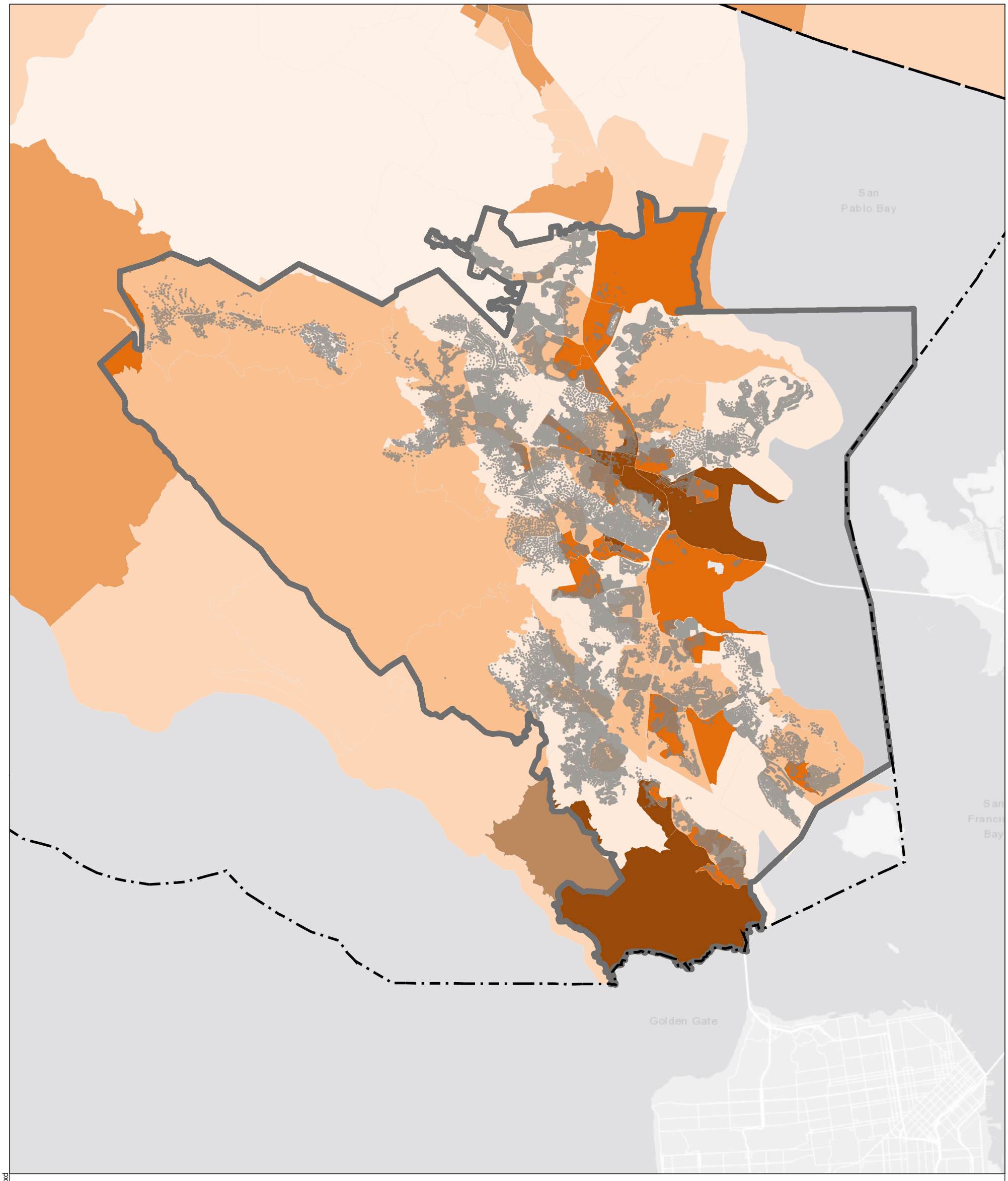
C00004.00

Figure 5-3a

Path: X:\C00004_SonomaMarin\Map\2020\12_MMWD\Fig5-3a_MMWD_HouseholdIncome_20201105.mxd



Legend

- County Boundary
- Service Area Boundary
- Residential Customers

Percentage of Renters

- ≤25%
- 25.1% - 50%
- 50.1% - 75%
- ≥75%

N

0 2 4

Miles

Notes

1. All locations are approximate.
2. Percentage of renter-occupied housing units is based on the estimated 2017 number of renter-occupied housing units by Census Block Group, per Census (2019).

Sources

1. Census 2019. 2013-2017 American Community Survey (ACS) 5-year estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau.
2. Basemap provided by ESRI.

Percentage of Renters

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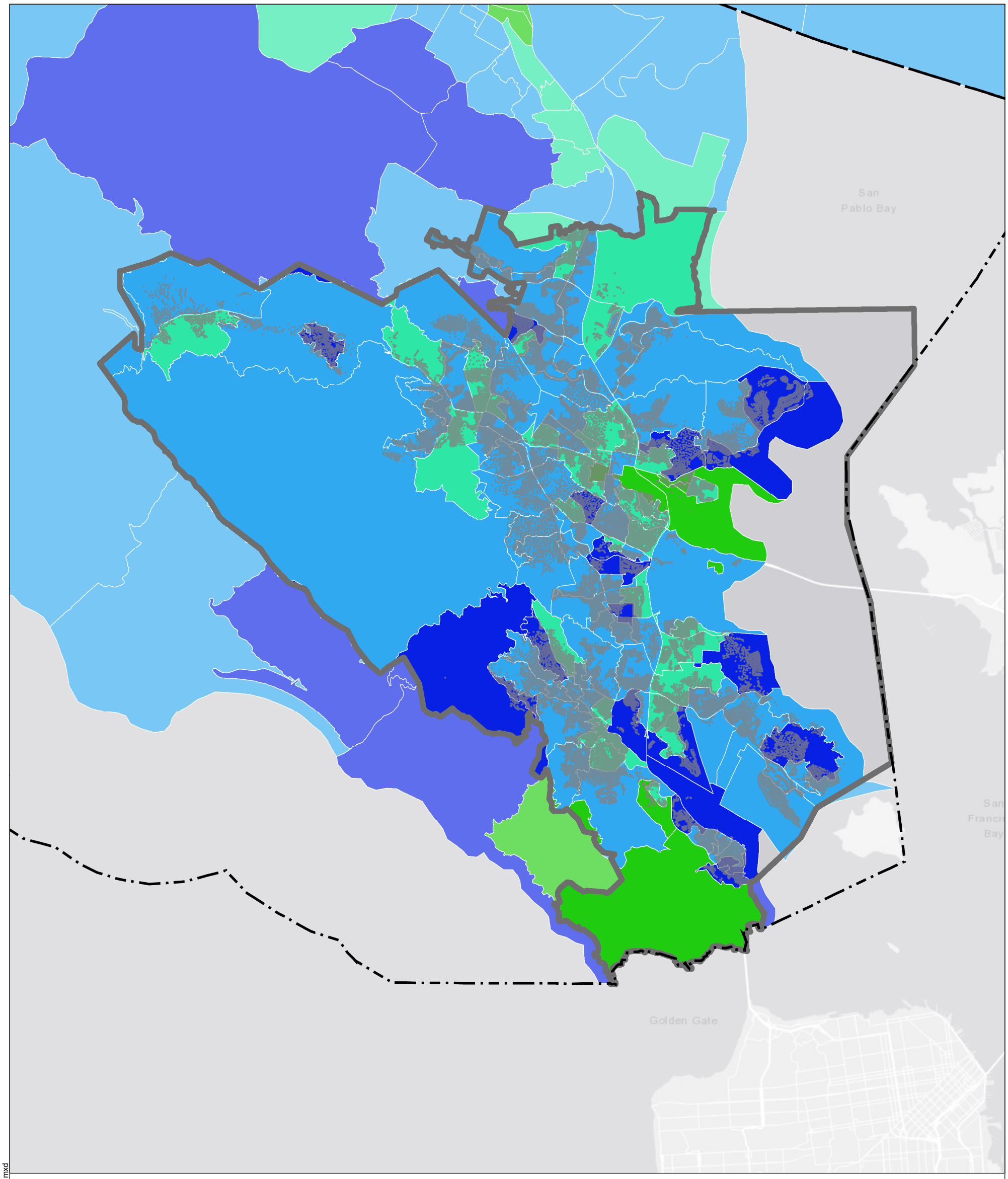
C00004.00
Figure 5-3b

Path: X:\C00004_SonomaMarin\Map\2020\12_MMWD\Fig5-3b_MMWD_PercentRenters_20201105.mxd



Legend

- County Boundary
- Service Area Boundary
- Residential Customers

Median Household Age

- <35 Years
- 35 - 45 Years
- 45 - 55 Years
- >55 Years

N

0 2 4

Miles

Notes

1. All locations are approximate.
2. Household age is based on estimated 2017 median age of household members by Census Block Group, per Census (2019).

Sources

1. Census, 2019. 2013-2017 American Community Survey (ACS) 5- ear estimates. TIGER/Line Shapefiles by Block Group, https://www.census.gov/geo/maps-data/data/tiger-data.html, United States Census Bureau.
2. Basemap provided by ESRI.

Median Household Age

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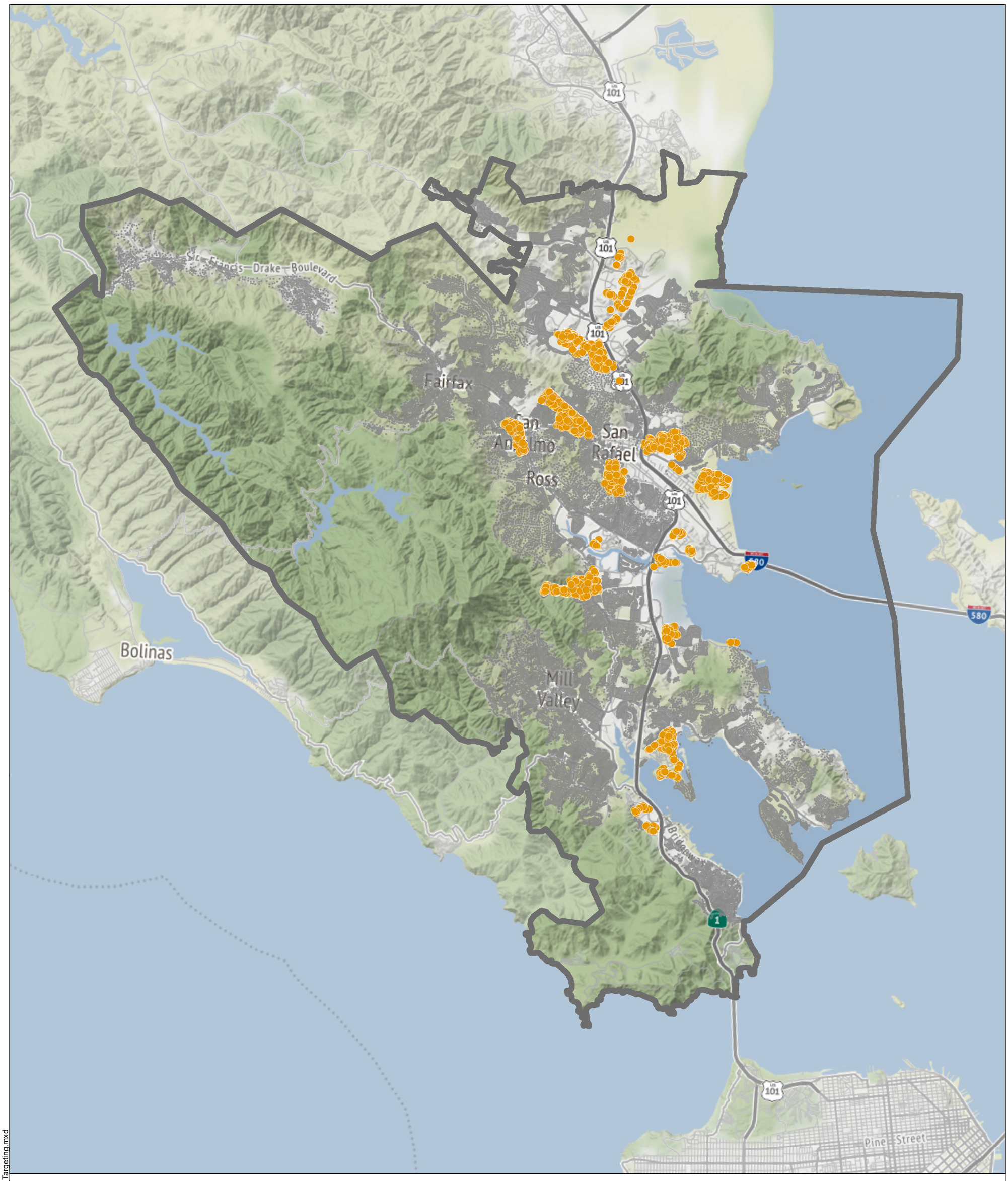
C00004.00
Figure 5-3c

Path: X:\C00004_SonomaMarin\Map\2020\12_MMWD\Fig5-3c_MMWD_HouseholdIncome_20201208.mxd



Legend

- All SFR Customers
- SFR Customers to Potentially Target with Outreach (8,891 customers)

Abbreviation

SFR = single family residential
WBIC = Weather-Based Irrigation Controller

Notes

1. All locations are approximate.
2. SFR customers to potentially target with outreach for the SFR WBIC Rebate Program are identified as those (1) outside areas of high participation, (2) within low income household areas, and (3) within areas of 50-75% rentership.

Sources

1. Water use efficiency program data provided by Marin Municipal Water District on April 2020.
2. Basemaps provided by ESRI and Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

N

0 2 4

Miles

SFR Customers to Potentially Target with SFR WBIC Rebate Program Outreach

Marin Municipal Water District
December 2020
C00004.00

Figure 5-4

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Path: X:\C00004_SonomaMarinMap\2020\12_MMWD\Fig5-4_MMWD_HotSpot_SFR_WBIC_Rebate_Targeting.mxd

6. CONSERVATION PROGRAM UPDATE

The following section evaluates current and potential conservation programs for both the District and the SMSWP. The purpose of this section is to compile programs that are prioritized by both the District and by all Water Contractors in the SMSWP collectively in order to calculate the potential water savings and economic feasibility of those programs. Section 6.1 discusses the methodology used to prioritize conservation programs. Section 6.2 describes the programs given high priority for implementation by all nine Water Contractors collectively, and Section 6.3 describes programs given high priority by the District. Section 6.4 analyzes the potential water savings and cost-benefit for those programs selected by the District as both individual programs and in three implementation scenarios. By assessing the feasibility of these programs, the District can make more informed decisions regarding program selection and implementation.

6.1. Methodology for Screening of Potential Water Conservation Programs

In order to evaluate the potential for new conservation programs, a comprehensive list of over 100 conservation programs was developed (**Appendix D**). Each of the nine Water Contractors were first asked to review and identify any additional programs to add to this list. Following receipt of feedback from the Water Contractors, each Water Contractor was asked to review the list and identify:

- Priority (on a scale of 1 to 5, with 5 being the highest priority) as a program to be implemented regionally through the SMSWP;
- Priority (on a scale of 1 to 5, with 5 being the highest priority) as a program to be implemented locally through their agency;
- Preference for the program to be implemented either regionally or locally; and
- Whether each program is currently or has previously been implemented by their agency.

The list of water conservation programs is organized into four categories, specifically: (1) retailer actions and water rates, (2) public outreach and education, (3) device-based and financial incentive programs, and (4) policies and regulations. The results of the water conservation program prioritization and screening are summarized for all Water Contractors combined, representing overall regional priorities and preferences (**Table 6-1**), and for each individual Water Contractor, representing each agencies local priorities and preferences. **Table 6-1** shows the average prioritization ranking for all Water Contractors for each program for regional and local implementation as well as the percentage of Water Contractors that prefer each program to be implemented at the local level or the regional level.[22] The results presented in **Table 6-1** are discussed below for each water conservation program category. **Table 6-2** provides the results of this screening for the Marin Municipal Water District, including priorities and preferences for each water conservation program, and identifies the target sector, whether the program addresses indoor or outdoor water use, and the primary end use.

[22] Water Contractors were asked to provide a preference for local or regional implementation for all programs they ranked a priority score of 3 or above. Thus, the percentages of Water Contractors shown in **Table 6-1** does not sum to 100%.

6.2. Screening of Regional Conservation Measures

6.2.1. Retailer Actions and Water Rate Based Conservation Programs

Of the 15 retailer action and water rate based conservation programs included in the screening list, the Water Contractors identified the following ten programs as high priority (average score of three or higher) to implement at the local level:

1. Install Advanced Metering Infrastructure (AMI) for High Water Users and Large Landscape Accounts
2. Install AMI in New Development
3. Customer Water Loss Reduction (AMI Leak Notifications)
4. Install AMI for Existing Accounts
5. Tiered Water Rates (Conservation Pricing)
6. Water Budgeting/Monitoring for Large Landscape Accounts
7. Water Budget Based Billing for Only Irrigation Customers
8. Modification to or Implementation of Tiered Rate Conservation Pricing
9. Establish Separate Pricing Structure for Irrigation Accounts
10. Rate Structure Evaluation
11. Increase Enforcement of State Water Waste Regulations

By their nature as water retailer actions, these programs do not lend themselves to regional implementation. However, in some cases, such as the "Increase Enforcement of State Water Waste Regulations" program, there may be an opportunity to coordinate across the region at a policy or education level. For example, SB-407[23] requires older plumbing fixtures to be replaced with new, more efficient fixtures that meet current water efficiency standards; this requirement is supposed to be enforced at time of sale. If this or similar policies are being enforced differently across Water Contractor jurisdictions, it could result in confusion among customers. Thus, even for retailer action-based programs, there may be opportunity for the Water Contractors to coordinate these efforts and share staff education resources.

6.2.2. Public Outreach and Education Based Conservation Programs

Of the 11 public outreach and education-based water conservation programs included in the screening, the Water Contractors identified the following six programs as high priority (average score of three or higher), with a preference for regional implementation through SMSWP:

1. Qualified Water Efficient Landscaper (QWEL) Training
2. Public Outreach through Print & Electronic Media – Focused on Outdoor Irrigation
3. Educational Workshops
4. School Education Programs
5. Public Outreach through Print & Electronic Media – Focused on Indoor Conservation
6. Garden tour

[23] SB 407: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920100SB407

All of these programs are currently being implemented by the SMSWP. In addition to these programs, the Water Contractors also indicated that water use surveys or audits for single-family residential and CII customers were a high priority; however, the Water Contractors generally expressed a preference for these programs to be implemented locally.

6.2.3. Device and Financial Incentive Based Conservation Programs

Of the 61 device- and financial incentive- based water conservation programs included in the screening list, the Water Contractors identified the following 11 programs as high priority (average score of three or higher) to implement at either the regional or local level:

1. Landscape Conversion or Turf Removal – multi-family residential (MFR) and CII
2. Landscape Conversion or Turf Removal – single family residential (SFR)
3. High Efficiency Faucet Aerator / Showerhead Giveaway – Residential Customers
4. Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates – Large Landscape
5. Drip Irrigation Incentive for SFR
6. High Efficiency Faucet Aerator / Showerhead Giveaway – CII Customers
7. Drip Irrigation Incentive for MFR and CII
8. High Efficiency Clothes Washer Rebate – Residential
9. Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates – SFR
10. Restaurant Spray Nozzle Rebates
11. Incentivize Irrigation Equipment Upgrades – SFR

The above list includes four programs that focus on indoor water use ("High Efficiency Faucet Aerator / Showerhead Giveaway – Residential Customers", "High Efficiency Faucet Aerator / Showerhead Giveaway – CII Customers", "High Efficiency Clothes Washer Rebate – Residential," and "Restaurant Spray Nozzle Rebates"). The remaining preferred programs all focus on outdoor water use, including turf removal and methods to increase irrigation efficiency.

Of these preferred programs, the Water Contractors expressed a preference for two of the programs to be administered at a regional level rather than local level, specifically the "High Efficiency Clothes Washer Rebate – Residential" and the "Restaurant Spray Nozzle Rebates".

6.2.4. Policy and Regulation Based Conservation Programs

Of the 29 policy- and regulation- based water conservation programs included in the screening list, the Water Contractors identified the following six programs as high priority (average score of three or higher) to implement at the local level:

1. Water Waste Ordinance
2. Require Submetering of Landscaping for New MFR and Commercial Developments
3. Require Water Efficiency Plan Reviews for New CII Development
4. Require High Efficiency Clothes Washers in New Development
5. Require Weather Adjusting Smart Irrigation Controllers, Rain Sensors, and/or Soil Moisture Sensors in New Development
6. Demand Offset/Water Neutral Policy for Large New Developments

Nearly all of the highest priority programs focus on ensuring efficiency in new developments, and target both indoor and outdoor water use. The Water Contractors expressed that the program "Require Irrigation Designers / Installers be Certified (QWEL)" is a high priority at the local level but were split equally as to whether they would prefer this program to be implemented at a local or regional level. Further, given the shift in state policy regarding recycled water use (i.e., that non-potable use of recycled water use will no longer be counted towards water conservation), some Water Contractors were conflicted as to how recycled water should be considered in policies regarding new development, in particular with respect to the program "Demand Offset/Water Neutral Policy for Large New Development."

6.2.5. Regional Program Screening Findings

With some exceptions, the Water Contractors expressed a strong preference for water conservation programs to be implemented locally rather than regionally through the SMSWP, with the exception of programs that are already implemented regionally by the SMSWP. However, as listed above, there was general consensus among Water Contractors about which water conservation programs are a high priority, and thus important for the region. Given this consensus, while there is not an apparent desire to implement programs regionally, there may be opportunity for further coordination and collaboration on these programs, such as sharing of educational resources, training of staff (e.g., building permit and plan review staff), and collaboration on creating similar program structure and requirements (such as for financial incentive-based programs) across the region.

6.3. Screening of Local Conservation Measures

Table 6-2 shows the results of this screening for the Marin Municipal Water District, and lists the programs considered by the District to be medium or high priority to consider for the future. **Table 6-2** also identifies the target sector, whether the program addresses indoor or outdoor water use, and the primary targeted end use.

- **Retailer Actions and Water Rate Based Conservation Programs.** Eleven retailer action and water rate based conservation programs were identified as medium or high priority for potential future implementation, all of which are currently implemented locally by the District. Four programs target outdoor water use and seven target both indoor and outdoor water use.

- **Public Outreach and Education Based Conservation Programs.** The District ranked seven public outreach and education-based water conservation programs as medium to medium-high priority for potential future implementation, all of which are currently implemented by the District. Two programs target indoor water use, two target outdoor use, and three target both. Three were given a preference for local implementation, three were given regional preference, and one was given no preference.

- **Device and Financial Incentive Based Conservation Programs.** Twenty-five device and financial incentive based programs were ranked as medium to high priority for potential future implementation, eleven of which would be new programs for the District. Eight programs target indoor water use, fifteen target outdoor use, and two target both. Eighteen were given a

preference for local implementation and three were given no preference. The potential new programs are identified as follows, in general order of priority:

  - Drip Irrigation Incentive for SFR
  - Incentivize Irrigation Equipment Upgrades - SFR
  - Landscape Conversion or Turf Removal - MFR and CII
  - Landscape Conversion or Turf Removal -SFR
  - Soil Moisture Sensor Rebate
  - Water Savings Incentive Program for CII
  - Incentivize Gray Water Systems for New CII Development
  - Incentivize Replacement of Inefficient Commercial and Industrial Equipment
  - Rain Sensor Rebate
  - Rotating Sprinkler Nozzle Giveaway
  - Rotating Sprinkler Nozzle Rebate

- **Policy and Regulation Based Conservation Programs.** Fourteen policy and regulation based programs were identified as highest priority for potential future implementation, nine of which are currently implemented by the District and five of which would be new programs. Three programs target indoor water use, eight target outdoor use, and three target both. All programs were given a preference for local implantation, except for "Waste Water Ordinance" (no preference). The potential new programs identified are as follows, in general order of priority:

  - Require Submetering of Landscaping for New MFR and Commercial Developments
  - Demand Offset/Water Neutral Policy for Large New Developments
  - Prohibit Once through Cooling Systems
  - Require <1.0 gal/flush Toilets in New Development
  - Require Rain Barrels in New Development

6.4. Evaluation of Future Water Conservation Programs

Based on the conservation screening process described in Sections 6.2 and 6.3 above, a suite of conservation programs to be considered for future implementation were evaluated. These programs were evaluated both individually and as components in three water conservation program scenarios, as shown in **Table 6-3a**. The three program scenarios represent three potential approaches or strategies for the District's future conservation programs, specifically:

- **Scenario A** represents a focus on programs that target outdoor water savings,
- **Scenario B** represents a more "business as usual" approach based on programs ranked most highly by the District, and
- **Scenario C** represents a focus on the programs that all nine Water Contractors collectively identified as highest priority.

Table 6-3a also identifies the customer sectors each program would target as well as whether the program focuses on indoor or outdoor water use, or both.

The benefits and costs associated with implementation of these programs were evaluated using the AWE model, using a series of assumptions documented in **Appendix B**.[24] Key assumptions and considerations related to the methodology used by the AWE model and in this analysis are provided below:

- Financial assumptions related to both costs to the utility and customer water rates were provided by the District.
- Financial assumptions related to energy costs to the customer were assumed based on typical PG&E rates (PG&E, 2020; PG&E and Marin Clean Energy, 2020).
- Water savings assumptions were based on a combination of District-specific water savings estimates per Section 5.3.2, AWE model default assumptions, assumptions developed for the District as a part of the 2015 conservation modeling, and water savings factors developed based on other published literature sources.
- Assumed rate of program implementation was based on historical participation levels by District customers in similar programs.
- For purposes of near-term conservation program analysis, it is assumed that all programs are active from 2021 through 2025; water savings projections beyond this period reflect cumulative savings achieved over time from implementation during this five-year period.
- Benefit-costs ratios are particularly sensitive to the assumed nominal rate of increase of the utility water cost.
- Lost revenue due to reduced water sales is not included as a cost.
- Additional program-specific considerations are provided as notes in the attached tables.

Table 6-3b presents a comparison of individual water conservation measures, and identifies the following information for each program:

- **Net present value of costs and benefits** – represents the present value over the 25-year period discounted to current 2020 dollars.
- **Benefit to cost ratio** – calculated as present value of costs divided by the present value of benefits.
- **Water Utility Costs** – costs that the District as a water utility will incur to operate the program including administrative costs.
- **Customer Costs** – costs customers will incur to implement a program in the Water Contractor's service area.
- **Utility Benefits** – the avoided cost to the District to produce the volume of water saved.
- **Customer Benefits** – the savings from reduced water/sewer utility bills and energy savings resulting from reduced use of hot water.
- **Total Water Utility Costs** – includes costs to the District for program implementation from 2021-2025.

[24] Alliance for Water Efficiency, Water Conservation Tracking Tool Version 3, released in July 2016.

- **Water Savings in 2025** – one-year estimated water savings in 2025.
- **Water Utility Cost of Water Saved for individual programs** – cost of water saved dividing by the lifetime water savings of that program.
- **Water Utility Cost of Water Saved for program scenarios** – weighted average of Water Utility Cost of Water Saved for the individual programs by the cumulative water savings through 2045.

This analysis estimates active program savings based on the AWE model, and does not include additional savings anticipated from passive savings (i.e., water savings associated with the natural replacement of less efficient water using fixtures and appliances due to both market shifts and increasing efficiency mandated by the building code and other regulatory requirements). Based on this analysis, and the assumptions presented in **Appendix B**, the benefit-cost ratios for the District range from 0.52 to 116.

Table 6-3c presents the results of the analysis of the three conservation program scenarios identified in **Table 6-3a**, and includes a summary of costs and benefits to the District and customers, estimated cumulative water savings through 2045 (based on assumed program implementation from 2021-2025), and the estimated cost of water saved to the District. Based on this, the approach of focusing water conservation measures on those ranked highest by the District (i.e., Scenario B) has a greater benefit to cost ratio than that of Scenarios A or C. The projected water savings associated with implementation of Scenario B is 584 AF by 2025 and 2,205 by 2045, at a cost of approximately $332/AF. The high benefit-cost ratio in this scenario is driven primarily by the CII Water Savings Incentive Program, which has a guaranteed rate of water savings per agency cost.

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Marin Municipal Water District

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
RETAILER ACTIONS AND WATER RATES						
Install AMI for High Water Users and Large Landscape Accounts	2.5	4.7	11%	67%	No	✗
Install AMI in New Development	2.4	4.7	0%	67%	No	✗
Customer Water Loss Reduction (AMI Leak Detection)	2.4	4.4	0%	89%	No	✗
Install AMI for Existing Accounts	2.4	4.0	0%	86%	No	✗
Tiered Water Rates (Conservation Pricing)	2.0	3.6	0%	88%	No	✗
Water Budgeting/Monitoring for Large Landscape Accounts	2.5	3.4	0%	83%	No	✗
Water Budget Based Billing for Only Irrigation Customers	2.1	3.4	0%	86%	No	✗
Modification to or Implementation of Tiered Rate Conservation Pricing	2.0	3.4	0%	88%	No	✗
Establish Separate Pricing Structure for Irrigation Accounts	2.0	3.2	0%	83%	No	✗
Rate Structure Evaluation	2.4	3.1	0%	78%	No	✗
Increase Enforcement of State Water Waste Regulations	2.6	3.0	0%	86%	No	✗
Water Budget Based Billing for All Customers	2.3	2.4	0%	50%	No	✗
Increase Enforcement of Indoor Fixture Retrofit at Time of Sale	1.9	2.2	17%	67%	No	✗
Increase Enforcement of Customer Pressure Reducing Valve (PRV) Requirement	1.6	1.9	0%	40%	No	✗
Regional UHET and/or Urinal Bulk Purchase Program	1.9	1.7	75%	0%	No	✗
Average by Program Type	2.2	3.3				
PUBLIC OUTREACH AND EDUCATION						
QWEL Training (Qualified Water Efficient Landscaper)	4.3	2.0	89%	0%	Yes	✓
Public Outreach through Print & Electronic Media - Focused on Outdoor Irrigation	4.0	3.9	67%	0%	Yes	✓
Educational Workshops	4.0	3.2	63%	0%	Yes	✓
School Education Programs	4.0	3.1	78%	0%	Yes	✓

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Marin Municipal Water District

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
Water Use Surveys/Audits - SFR	3.5	3.9	22%	44%	No	✗
Public Outreach through Print & Electronic Media - Focused on Indoor Conservation	3.6	3.3	57%	0%	Yes	✓
Garden tour	3.6	1.9	86%	0%	Yes	✓
Water Use Surveys/Audits - CII	3.0	3.4	38%	38%	No	✗
Water Use Surveys/Audits - MFR	2.8	3.3	29%	43%	No	✗
Promote Green Building and Certification	3.1	2.2	33%	17%	No	✗
Provide Support with Smart Irrigation Controller Setup	2.9	2.3	60%	0%	No	✗
Average by Program Type	3.5	3.0				
DEVICE-BASED AND FINANCIAL INCENTIVE PROGRAMS						
Landscape Conversion or Turf Removal - MFR and CII	3.9	4.6	11%	78%	No	✗
Landscape Conversion or Turf Removal -SFR	3.9	4.6	22%	67%	No	✗
High Efficiency Faucet Aerator / Showerhead Giveaway - Residential Customers	3.0	3.9	11%	44%	No	✗
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - Large Landscape	3.1	3.6	38%	38%	No	✗
Drip Irrigation Incentive for SFR	2.4	3.6	25%	50%	No	✗
High Efficiency Faucet Aerator / Showerhead Giveaway - CII Customers	2.9	3.4	14%	57%	No	✗
Drip Irrigation Incentive for MFR and CII	2.4	3.4	25%	50%	No	✗
High Efficiency Clothes Washer Rebate - Residential	3.3	3.3	44%	11%	Yes	✓
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - SFR	2.9	3.2	14%	57%	No	✗
Restaurant Spray Nozzle Rebates	3.1	2.8	50%	0%	No	✗
Incentivize Irrigation Equipment Upgrades - SFR	2.1	3.0	17%	50%	No	✗
Indoor Fixture Program For Schools	2.9	2.9	14%	71%	No	✗
Rotating Sprinkler Nozzle Rebate	2.9	2.9	40%	20%	No	✗

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Marin Municipal Water District

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
High Efficiency Clothes Washer Rebate Program - CII	2.8	2.8	29%	29%	No	✗
Direct Install of Efficient Indoor Fixtures - Low Income Residential	2.8	2.6	60%	0%	No	✗
Indoor Fixture Program For Hotels & Motels	2.8	2.2	29%	43%	No	✗
Mulch rebate	2.6	2.7	33%	50%	No	✗
Rain Sensor Rebate	2.5	2.6	33%	50%	No	✗
Incentivize Submetering for Existing Customers - CII	2.4	2.6	25%	25%	No	✗
Incentivize Submetering for Existing Customers - MFR	2.4	2.6	25%	25%	No	✗
Incentivize Gray Water Retrofit for Existing SFR Customers	2.3	2.6	20%	60%	No	✗
Toilet Flapper Giveaway - SFR customers	2.1	2.6	40%	40%	No	✗
Rotating Sprinkler Nozzle Giveaway	2.5	2.1	60%	0%	No	✗
Incentivize Replacement of Inefficient Commercial and Industrial Equipment	2.4	2.4	33%	33%	No	✗
Soil Moisture Sensor Rebate	2.4	2.4	60%	20%	No	✗
High Efficiency Urinal (<0.25 gal/flush) Rebates - CII	2.4	2.4	25%	0%	No	✗
Incentivize Gray Water Systems for New CII Development	2.3	2.4	50%	25%	No	✗
Incentivize Irrigation Equipment Upgrades - Large Landscapes	1.9	2.4	20%	40%	No	✗
Direct Install of Efficient Indoor Fixtures - Residential	2.4	2.2	50%	0%	No	✗
High Efficiency Clothes Washer Install - Low Income Residential Customers	2.4	2.2	50%	0%	No	✗
Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - Large Landscape	2.4	2.0	80%	0%	No	✗
Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - SFR	2.4	2.0	60%	20%	No	✗
Incentivize Artificial Turf for Sports Fields	2.3	2.3	75%	0%	No	✗
UHET <1.0 gal/flush Rebate - Residential	2.1	2.3	50%	17%	No	✗
Water Savings Incentive Program for CII	2.1	2.2	40%	40%	No	✗

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Marin Municipal Water District

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
Hot Water on Demand Pump System Rebate	2.0	2.2	60%	20%	No	✗
UHET Direct Installation - CII	2.1	1.8	40%	0%	No	✗
Plumber Initiated UHET and / or Urinal Retrofit Program	2.1	1.8	67%	0%	No	✗
Direct Install of Efficient Indoor Fixtures - Government Buildings	2.1	1.6	50%	0%	No	✗
Rain Barrel Rebate	1.9	2.1	40%	40%	No	✗
Incentivize Replacement of Pressure Reducing Valves (PRVs) with 60-70 psi PRVs	2.0	2.0	33%	33%	No	✗
Thermostatic Shut-Off Valve Showerheads/Tub Spouts Rebates	2.0	1.9	50%	0%	No	✗
Dipper Well Rebates	2.0	1.8	50%	0%	No	✗
Rain Sensor Giveaway	2.0	1.7	75%	0%	No	✗
Rebates for Conductivity Controllers on Cooling Towers	2.0	1.6	75%	0%	No	✗
Rainwater Catchment System Rebate for Large Landscapes	1.9	2.0	50%	25%	No	✗
Nonresidential Incentive for Self-closing or Metering Faucets	1.9	1.9	33%	33%	No	✗
Efficient (EnergyStar) Dishwasher Rebates	1.9	1.8	50%	0%	No	✗
Rain Barrel Giveaway	1.9	1.7	75%	0%	No	✗
UHET Direct Installation - Residential	1.9	1.7	50%	0%	No	✗
Autoclave (Steam-Sterilizer) Retrofit Rebates	1.9	1.7	67%	0%	No	✗
Connectionless Food Steamer Rebates	1.9	1.7	67%	0%	No	✗
Dry Vacuum Pumps	1.9	1.6	33%	0%	No	✗
Incentivize Cooling Tower Upgrades	1.9	1.6	50%	0%	No	✗
UHET <1.0 gal/flush Rebate - CII	1.8	1.8	60%	20%	No	✗
Soil Moisture Sensor Giveaway	1.8	1.7	67%	0%	No	✗
Direct Install of Efficient Indoor Fixtures - Commercial and Industrial	1.8	1.7	67%	0%	No	✗

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Marin Municipal Water District

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
Swimming Pool and Hot Tub Cover Rebates	1.3	1.7	50%	25%	No	✗
Urinal Direct Installation - CII	1.5	1.4	50%	0%	No	✗
Tier 4 Exemption	1.3	1.4	25%	25%	No	✗
Incentivize Submetering of Cooling Towers for Existing Customers	1.3	1.4	50%	0%	No	✗
Average by Program Type	2.3	2.3				
POLICIES AND REGULATIONS						
Water Waste Ordinance	2.9	4.3	0%	63%	No	✗
Require Submetering of Landscaping for New MFR and Commercial Developments	2.8	4.0	0%	63%	No	✗
Require Water Efficiency Plan Reviews for New CII Development	2.5	3.7	14%	57%	No	✗
Require High Efficiency Clothes Washers in New Development	2.8	3.3	17%	67%	No	✗
Require Weather Adjusting Smart Irrigation Controllers, Rain Sensors, and/or Soil Moisture Sensors in New Development	2.4	3.1	0%	80%	No	✗
Require Irrigation Designers / Installers be Certified (QWEL)	3.0	2.9	40%	40%	No	✗
Demand Offset/Water Neutral Policy for Large New Developments	2.4	3.0	0%	83%	No	✗
Require Efficient (EnergyStar) Dishwashers in New Development	2.8	2.9	20%	60%	No	✗
Require <0.25 gal/flush Urinals in New Development	2.3	2.8	0%	67%	No	✗
Water Conserving Landscape and Irrigation Codes, More Stringent than MWELO	1.6	2.8	0%	67%	No	✗
Require Swimming Pool and Hot Tub Covers	2.0	2.7	40%	20%	No	✗
Require Submetering by Unit for New Commercial Developments	2.3	2.6	0%	50%	No	✗
Require Submetering of Landscaping for Existing MFR and Commercial Customers	2.4	2.4	0%	67%	No	✗
Require Hot Water on Demand / Structured Plumbing in New Residential Development	2.3	2.4	25%	50%	No	✗
Require Submetering by Unit for Existing Commercial Customers	2.1	2.4	0%	25%	No	✗

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Marin Municipal Water District

Conservation Measure/Program	Prioritization (a)		Preference (b)		Current SMSWP Program	
	Regional	Local	Regional Program	Local Program		
Require Submetering for New MFR Developments	1.9	2.4	0%	50%	No	✗
Require Plumbing for Recycled Water in New MFR Development	2.0	2.3	0%	60%	No	✗
Require <1.0 gal/flush Toilets in New Development	2.0	2.3	0%	80%	No	✗
Require Submetering for New Mobile Home Park Developments	2.0	2.3	0%	40%	No	✗
Prohibit Once through Cooling Systems	2.0	2.2	0%	50%	No	✗
Require Plumbing for Recycled Water in New CII Development	1.9	2.2	0%	60%	No	✗
Require On-Site Water Reuse Systems (Grey Water or Black Water) for Large CII Developments	1.8	2.1	25%	50%	No	✗
Require Plumbing for Gray Water in New SFR Development	1.6	2.1	0%	75%	No	✗
Require Submetering of Cooling Towers for New Development	2.0	1.9	0%	33%	No	✗
Require Submetering of Existing MFR (and Mobile Home Park) Customers	1.9	1.9	0%	50%	No	✗
Restrict Landscape Irrigation to Designated Days/Times	1.6	1.8	33%	0%	No	✗
Require Rain Barrels in New Development	1.5	1.8	0%	67%	No	✗
Require Submetering of Cooling Towers for Existing Customers	1.8	1.6	0%	50%	No	✗
Require Cooling Tower Retrofits	1.5	1.4	0%	33%	No	✗
Average by Program Type	2.1	2.5				

Table 6-1
Regional Prioritization of Conservation Measures and Programs
Marin Municipal Water District

Abbreviations:

AMI = advanced metering infrastructure
CII = commercial, industrial, institutional
MFR = multi-family residential
MWELO = Model Water Efficient Landscape Ordinance
PRV = pressure reducing valve
SFR = single-family residential
SMSWP = Sonoma-Marin Saving Water Partnership
UHET = ultra high efficiency toilet

Notes:

(a) Each Water Contractor was asked to rank each conservation program or measure in terms of priority as a regionally-administered program, and as a locally-administered program, where 5 indicated highest priority and 1 indicated the lowest priority. Results are presented as an average of the responses of all nine Water Contractors.

(b) For each program a Water Contractor ranked as "3" or above, the Water Contractor was asked to indicate whether they would prefer the program to be administered regionally or locally. The results are presented as a percentage of the number of Water Contractors. Results of contractors who expressed "no preference" are not shown, and thus the total may not sum to 100% for a given measure.

Table 6-2
Prioritization of Conservation Measures and Programs
Marin Municipal Water District

Conservation Measure/Program	Prioritization (a)	Sector	Indoor	Outdoor	Primary End Use	Preference (b)	Local Program
RETAILER ACTIONS AND WATER RATES							
Establish Separate Pricing Structure for Irrigation Accounts	5	IRR		X	Irrigation	Locally	Yes, currently
Install AMI for High Water Users and Large Landscape Accounts	5	All		X	Water Loss	Locally	Yes, currently
Install AMI in New Development	5	All	X	X	Water Loss	Locally	Yes, currently
Modification to or Implementation of Tiered Rate Conservation Pricing	5	All	X	X	All	Locally	Yes, currently
Tiered Water Rates (Conservation Pricing)	5	All	X	X	All	Locally	Yes, currently
Water Budget Based Billing for Only Irrigation Customers	5	CII, IRR		X	Irrigation	Locally	Yes, currently
Customer Water Loss Reduction (AMI Leak Detection)	4	All	X	X	Water Loss	Locally	Yes, currently
Install AMI for Existing Accounts	4	All	X	X	Water Loss	Locally	Yes, currently
Water Budgeting/Monitoring for Large Landscape Accounts	4	IRR	X	X	Irrigation	Locally	Yes, currently
Increase Enforcement of State Water Waste Regulations	3	All		X	Irrigation	Locally	Yes, currently
Rate Structure Evaluation	3	All	X	X	All	Locally	Yes, currently
PUBLIC OUTREACH AND EDUCATION							
Water Use Surveys/Audits - CII	4	CII	X	X	All	Locally	Yes, currently
Water Use Surveys/Audits - MFR	4	MFR	X		All Indoor	Locally	Yes, currently
Water Use Surveys/Audits - SFR	4	SFR	X	X	All	Locally	Yes, currently
Educational Workshops	3	SFR		X	All Outdoor	No preference	Yes, currently
Public Outreach through Print & Electronic Media - Focused on Indoor Conservation	3	All		X	All Indoor	Regionally	Yes, currently
Public Outreach through Print & Electronic Media - Focused on Outdoor Irrigation	3	All	X		Irrigation	Regionally	Yes, currently
School Education Programs	3	SFR, MFR	X	X	All	Regionally	Yes, currently
DEVICE-BASED AND FINANCIAL INCENTIVE PROGRAMS							
High Efficiency Faucet Aerator / Showerhead Giveaway - CII Customers	5	CII	X		Faucet, Showerhead	Locally	Yes, currently
High Efficiency Faucet Aerator / Showerhead Giveaway - Residential Customers	5	SFR, MFR	X		Faucet, Showerhead	Locally	Yes, currently
Drip Irrigation Incentive for MFR and CII	4	MFR, CII		X	Irrigation	Locally	Yes, previously
Drip Irrigation Incentive for SFR	4	SFR		X	Irrigation	Locally	No

Table 6-2
Prioritization of Conservation Measures and Programs
Marin Municipal Water District

Conservation Measure/Program	Prioritization (a)	Sector	Indoor	Outdoor	Primary End Use	Preference (b)	Local Program
Incentivize Irrigation Equipment Upgrades - Large Landscapes	4	MFR, CII, IRR		X	Irrigation	Locally	Yes, previously
Incentivize Irrigation Equipment Upgrades - SFR	4	SFR		X	Irrigation	Locally	No
Landscape Conversion or Turf Removal - MFR and CII	4	MFR, CII		X	Irrigation	Locally	No
Landscape Conversion or Turf Removal -SFR	4	SFR		X	Irrigation	Locally	No
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - Large Landscape	4	MFR, CII		X	Irrigation	Locally	Yes, currently
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - SFR	4	SFR		X	Irrigation	Locally	Yes, currently
Soil Moisture Sensor Rebate	4	All		X	Irrigation	Locally	No
Water Savings Incentive Program for CII	4	CII	X		All Indoor	Locally	No
High Efficiency Clothes Washer Rebate - Residential	3	SFR, MFR	X		Clothes Washer	No preference	Yes, currently
High Efficiency Clothes Washer Rebate Program - CII	3	CII	X		Clothes Washer	Locally	Yes, currently
Incentivize Gray Water Retrofit for Existing SFR Customers	3	SFR		X	Irrigation / Gray Water	Locally	Yes, currently
Incentivize Gray Water Systems for New CII Development	3	CII	X	X	Irrigation / Gray Water	Locally	No
Incentivize Replacement of Inefficient Commercial and Industrial Equipment	3	CII	X		CII Equipment	Locally	No
Indoor Fixture Program For Hotels & Motels	3	CII	X		All Indoor	Locally	Yes, previously
Indoor Fixture Program For Schools	3	CII	X		All Indoor	Locally	Yes, previously
Rain Barrel Rebate	3	SFR		X	Irrigation	Locally	Yes, previously
Rain Sensor Rebate	3	All		X	Irrigation	Locally	No
Rainwater Catchment System Rebate for Large Landscapes	3	MFR, CII		X	Irrigation	Locally	Yes, previously
Rotating Sprinkler Nozzle Giveaway	3	All		X	Irrigation	No preference	No
Rotating Sprinkler Nozzle Rebate	3	All		X	Irrigation	No preference	No
Tier 4 Exemption	3	SFR	X	X	toilet, Faucet, Showerhead, clothes washer, irrigation	Locally	Yes, currently
POLICIES AND REGULATIONS							
Require <0.25 gal/flush Urinals in New Development	5	CII	X		Urinal	Locally	Yes, currently
Require High Efficiency Clothes Washers in New Development	5	SFR, MFR	X		Clothes Washer	Locally	Yes, currently

Table 6-2
Prioritization of Conservation Measures and Programs
Marin Municipal Water District

Conservation Measure/Program	Prioritization (a)	Sector	Indoor	Outdoor	Primary End Use	Preference (b)	Local Program
Require On-Site Water Reuse Systems (Grey Water or Black Water) for Large CII Developments	5	CII		X	Irrigation / Recycled Water	Locally	Yes, currently
Require Plumbing for Gray Water in New SFR Development	5	SFR		X	Irrigation / Gray Water	Locally	Yes, currently
Require Swimming Pool and Hot Tub Covers	5	SFR, MFR		X	Pool/Hot Tub	Locally	Yes, currently
Require Water Efficiency Plan Reviews for New CII Development	5	CII	X	X	All Indoor	Locally	Yes, currently
Require Weather Adjusting Smart Irrigation Controllers, Rain Sensors, and/or Soil Moisture Sensors in New Development	5	All		X	Irrigation	Locally	Yes, currently
Water Conserving Landscape and Irrigation Codes, More Stringent than MWELO	5	All		X	Irrigation	Locally	Yes, currently
Water Waste Ordinance	5	All		X	All Outdoor	No preference	Yes, currently
Require Submetering of Landscaping for New MFR and Commercial Developments	4	CII		X	Irrigation	Locally	No
Demand Offset/Water Neutral Policy for Large New Developments	3	All	X	X	All	Locally	No
Prohibit Once through Cooling Systems	3	CII	X	X	CII Equipment	Locally	No
Require <1.0 gal/flush Toilets in New Development	3	All	X		Toilet	Locally	No
Require Rain Barrels in New Development	3	SFR		X	Irrigation	Locally	No

Abbreviations:
AMI = advanced metering infrastructure
CII = commercial, industrial, institutional
COM = commercial
IRR = irrigation account
MFR = multi-family residential
MWELO = Model Water Efficient Landscape Ordinance
PRV = pressure reducing valve
SFR = single-family residential
SMSWP = Sonoma-Marin Saving Water Partnership
UHET = ultra high efficiency toilet

Notes:

(a) Each Water Contractor was asked to rank each conservation program or measure in terms of priority as a locally-administered program, where 5 indicated highest priority and 1 indicated the lowest priority.

(b) For each program a Water Contractor ranked as "3" or above, the Water Contractor was asked to indicate whether they would prefer the program to be administered regionally or locally. N/A indicates no preference given for programs given a ranking lower than three for both local and regional priority.

Table 6-3a
Conservation Program Scenarios
Marin Municipal Water District

Program	Sector	Indoor/ Outdoor	Program Scenario (a)		
			A) Outdoor Programs	B) Highly-Ranked Local Programs	C) Highly-Ranked Regional Programs
High Efficiency Clothes Washer Rebate - Residential	SFR, MFR	Indoor			X
High Efficiency Faucet Aerator / Showerhead Giveaway - Residential Customers	SFR, MFR	Indoor		X	X
Incentivize Irrigation Equipment Upgrades - Large Landscapes	MFR, CII, IRR	Outdoor	X	X	
Incentivize Irrigation Equipment Upgrades - SFR	SFR	Outdoor	X	X	
Landscape Conversion or Turf Removal - MFR and CII	MFR, CII	Outdoor	X	X	X
Landscape Conversion or Turf Removal -SFR	SFR	Outdoor	X	X	X
Restaurant Spray Nozzle Rebates	CII	Indoor			X
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - Large Landscape	MFR, CII	Outdoor	X	X	X
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - SFR	SFR	Outdoor	X	X	
Soil Moisture Sensor Rebate	All	Outdoor	X	X	
Water Savings Incentive Program for CII	CII	Indoor		X	
Water Use Surveys/Audits - CII	CII	Both	X		X
Water Use Surveys/Audits - MFR	MFR	Indoor		X	
Water Use Surveys/Audits - SFR	SFR	Both	X		X

Abbreviations

CII = Commercial, Industrial, and Institutional
MFR = multi-family residential
SFR = Single-family residential

Table 6-3a
Conservation Program Scenarios
Marin Municipal Water District

Notes

(a) Program scenarios represent three potential approaches to program selection. Scenario A represents a focus on outdoor water savings, Scenario B represents a more "business as usual" approach based on programs ranked most highly by Marin Municipal Water District, and Scenario C represents a focus on the programs all nine Water Contractors collectively identified as highest priority.

Table 6-3b
Costs and Savings of Potential Conservation Programs
Marin Municipal Water District

Program (a)	Sector	Indoor/ Outdoor	Note	Net Present Value of Benefits		Net Present Value of Cost		Benefit to Cost Ratio		Water Utility Costs 2021-2025 (b)	Water Savings in 2025 (AFY)	Water Utility Cost of Water Saved ($/AF)
				Water Utility	Customers	Water Utility	Customers	Water Utility	Customers			
High Efficiency Clothes Washer Rebate - Residential	SFR, MFR	Indoor	(c)	$433,978	$1,579,895	$323,234	$1,037,663	1.3	1.5	$295,425	18	$1,369
High Efficiency Faucet Aerator / Showerhead Giveaway - Residential Customers	SFR, MFR	Indoor		$530,195	$1,215,639	$155,152	$248,641	3.4	4.9	$141,804	56	$500
Incentivize Irrigation Equipment Upgrades - Large Landscapes	MFR, CII, IRR	Outdoor	(d)	$234,582	$650,198	$149,349	$57,442	1.6	11	$136,500	12	$1,137
Incentivize Irrigation Equipment Upgrades - SFR	SFR	Outdoor		$64,542	$145,132	$65,785	$50,604	1.0	2.9	$60,125	3.2	$1,820
Landscape Conversion or Turf Removal - MFR and CII	MFR, CII	Outdoor	(e)	$310,238	$774,891	$594,324	$457,172	0.52	1.7	$543,192	15	$3,421
Landscape Conversion or Turf Removal - SFR	SFR	Outdoor	(e)	$103,413	$232,537	$198,108	$152,391	0.52	1.5	$181,064	5.1	$3,421
Restaurant Spray Nozzle Rebates	CII	Indoor		$318,529	$1,218,458	$17,780	$13,677	18	89	$16,250	34	$95
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - Large Landscape	MFR, CII	Outdoor		$179,392	$497,227	$35,916	$18,662	5.0	27	$32,826	8.9	$358
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - SFR	SFR	Outdoor	(c)	$197,545	$444,206	$50,167	$34,895	3.9	13	$45,851	10	$454
Soil Moisture Sensor Rebate	All	Outdoor		$363,376	$784,437	$52,628	$60,724	6.9	13	$48,100	7.9	$284
Water Savings Incentive Program for CII	CII	Indoor		$2,964,596	$7,257,526	$25,584	$29,520	116	246	$23,383	92	$16
Water Use Surveys/Audits - CII	CII	Both		$388,829	$993,499	$470,477	$588,096	0.83	1.7	$430,000	41	$2,051
Water Use Surveys/Audits - MFR	MFR	Indoor		$388,829	$640,597	$470,477	$588,096	0.83	1.1	$430,000	41	$2,051
Water Use Surveys/Audits - SFR	SFR	Both		$874,527	$2,334,034	$842,200	$199,953	1.04	11.7	$769,743	93	$1,632

Abbreviations

AFY = acre-feet per year
CII = Commercial, Industrial, and Institutional
MFR = multi-family residential
MMWD = Marin Municipal Water District
SFR = Single-family residential
sq ft = square feet
WBIC = weather-based irrigation controller
$/AF = dollars per acre-foot

Table 6-3b
Costs and Savings of Potential Conservation Programs
Marin Municipal Water District

Notes
(a) Estimated water savings, benefits, and costs are calculated using the AWE model. Assumptions used are presented in Appendix B.
(b) For purposes of near-term conservation program analysis, it is assumed that all programs are active from 2021 through 2025.
(c) Program savings are based on MMWD-specific estimates, which are derived from participant water savings based on their water bills.
(d) Cost-effectiveness of this program is largely driven by the cost and type of equipment replaced. If the program was focused on certain equipment types, its cost-effectiveness would likely be increased.
(e) Evaluation of this program assumed a rebate amount of $1/square foot plus administrative cost. It is noted that a lower rebate would result in a benefit-cost ratio of greater than 1.

Table 6-3c
Comparison of Program Scenarios – Costs and Savings
Marin Municipal Water District

Scenario (a)	Present Value of Benefits		Present Value of Cost		Benefit to Cost Ratio		Cumulative Water Savings (AF)					Water Utility Cost of Water Saved ($/AF) (b)
	Water Utility	Customers	Water Utility	Customers	Water Utility	Customers	2025	2030	2035	2040	2045	
A) Outdoor Programs	$2,406,206	$6,081,271	$1,864,629	$1,162,765	1.3	5.2	603	1,047	1,164	1,203	1,219	$1,529
B) Highly-Ranked Local Programs	$4,637,641	$11,226,903	$732,689	$652,879	6.3	17	584	1,389	1,966	2,189	2,205	$332
C) Highly-Ranked Regional Programs	$2,828,862	$8,071,289	$2,042,867	$2,259,082	1.4	3.6	829	1,364	1,450	1,469	1,469	$1,390

Abbreviations
AF = acre-feet
$/AF = dollars per acre-foot

Notes
(a) For purposes of near-term conservation program analysis, it is assumed that all programs are active from 2021 through 2025. Cumulative water savings achieved beyond 2025 reflect the ongoing benefit of program implementation.
(b) The water utility cost is based on the cumulative savings achieved through 2045 cumulative water savings.

7. CONCLUSION

This report presents the results of demand analysis and projections, developed consistent with CWC § 10631(d)(4)(A), which requires that "Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area." The assumptions used as the bases for demand projections were developed in close coordination with the District and reflect a land-use based approach consistent with the District's community planning, using the best available information. It should be noted that all demand and conservation projections have limitations and should be considered estimates that require revisiting as factors that affect demands arise, such as significant economic or population shifts, extreme hydrological conditions, etc.

The methodology used to develop demand projections herein is also consistent with the CWC §10635(b)(4), requirement to consider climate change on projected demands.[25] California experienced a historic drought between 2011-2017. In 2014, Governor Brown issued Executive Order B-26-14 declaring a Drought State of Emergency and requested all Californians to voluntarily reduce water use by 20%. In 2015, the State Water Resources Control Board implemented emergency conservation regulations that, among other things, required water agencies to reduce their water use and prohibited certain types of water uses. As a result, the District experienced an overall decrease in demands during the historic drought, most significantly during 2014. The demand factors evaluated herein consider both the 2011-2013 period, in which customers increased their water use (in part due to the drought conditions, prior to the imposed restrictions), as well as the observed rebound in demand following the drought (2017-2019). Thus, the periods used to develop the demand projections reflect conditions representative of the hotter, drier weather expected as a result of climate change.

[25] CWC §10635(b)(4) requires that suppliers consider plausible changes on projected supplies and demands under climate change conditions specific to their five-year drought risk assessments. Section 4.5 of the draft 2020 UWMP Guidebook more generally recommends that consideration of climate change be incorporated into all demand projections.

8. REFERENCES

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Appendix A

California Water Code Revisions per AB-1668, SB-606, and SB-664, Redlines prepared by DWR

SB-664 Water: urban water management planning. (2015-2016)

As Amends the Law Today **As Amends the Law on Nov 20, 2015**

SECTION 1. *Section 10632.5 is added to the Water Code, to read:*

10632.5. *(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.*

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

AB-1668 Water management planning. (2017-2018)

As Amends the Law Today | **As Amends the Law on Nov 08, 2018**

SECTION 1. Section 531.10 of the Water Code is amended to read:

531.10. (a) (1) An agricultural water supplier shall submit an annual report to the department that summarizes aggregated farm-gate delivery data, on a monthly or bimonthly basis, using best professional practices. The annual report for the prior year shall be submitted to the department by April 1 of each year. The annual report shall be organized by basin, as defined in Section 10721, within the service area of the agricultural water supplier, if applicable.

(2) The report, and any amendments to the report, submitted to the department pursuant to this subdivision shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(3) The department shall post all reports on its Internet Web site in a manner that allows for comparisons across water suppliers. The department shall make the reports available for public viewing in a timely manner after it receives them.

(b) Nothing in this article shall be construed to require the implementation of water measurement programs or practices that are not locally cost effective.

(c) It is the intent of the Legislature that the requirements of this section shall complement and not affect the scope of authority granted to the department or the board by provisions of law other than this article.

SEC. 2. Section 1120 of the Water Code is amended to read:

1120. This chapter applies to any decision or order issued under this part or Section 275, Part 2 (commencing with Section 1200), Part 2 (commencing with Section 10500) of Division 6, Part 2.55 (commencing with Section 10608) of Division 6, or Chapter 11 (commencing with Section 10735) of Part 2.74 of Division 6, Article 7 (commencing with Section 13550) of Chapter 7 of Division 7, or the public trust doctrine.

SEC. 3. *Section 1846.5 is added to the Water Code, to read:*

1846.5. *(a) An urban retail water supplier who commits any of the violations identified in subdivision (b) may be liable in an amount not to exceed the following, as applicable:*

(1) If the violation occurs in a critically dry year immediately preceded by two or more consecutive below normal, dry, or critically dry years or during a period for which the Governor has issued a proclamation of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, ten thousand dollars ($10,000) for each day in which the violation occurs.

(2) For all violations other than those described in paragraph (1), one thousand dollars ($1,000) for each day in which the violation occurs.

(b) Liability pursuant to this section may be imposed for any of the following violations:

(1) Violation of an order issued under Chapter 9 (commencing with Section 10609) of Part 2.55 of Division 6.

(2) Violation of a regulation issued under Chapter 9 (commencing with Section 10609) of Part 2.55 of Division 6, if the violation occurs after November 1, 2027.

(c) Civil liability may be imposed by the superior court. The Attorney General, upon the request of the board, shall petition the superior court to impose, assess, and recover those sums.

(d) Civil liability may be imposed administratively by the board pursuant to Section 1055.

SEC. 4. Section 10608.12 of the Water Code is amended to read:

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "CII water use" means water used by commercial water users, industrial water users, institutional water users, and large landscape water users.

(e) "Commercial water user" means a water user that provides or distributes a product or service.

(f) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(g) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(h) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(i) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(j) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(k) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(l) "Large landscape" means a nonresidential landscape as described in the performance measures for CII water use adopted pursuant to Section 10609.10.

(m) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(n) "Performance measures" means actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users. Performance measures may include, but are not limited to, educating CII water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not include process water.

(o) "Potable reuse" means direct potable reuse, indirect potable reuse for groundwater recharge, and reservoir water augmentation as those terms are defined in Section 13561.

(p) "Process water" means water used by industrial water users for producing a product or product content or water used for research and development. Process water includes, but is not limited to, continuous manufacturing processes, and water used for testing, cleaning, and maintaining equipment. Water used to cool machinery or buildings used in the manufacturing process or necessary to maintain product quality or chemical characteristics for product manufacturing or control rooms, data centers, laboratories, clean rooms, and other industrial facility units that are integral to the manufacturing or research and development process is process water. Water used in the manufacturing process that is necessary for complying with local, state, and federal health and safety laws, and is not incidental water, is process water. Process water does not mean incidental water uses.

(q) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050.

(r) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(s) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(t) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(u) "Urban water use objective" means an estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, as described in Section 10609.20.

(v) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(w) "Urban wholesale water ~~supplier"~~ *supplier,"* means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

SEC. 5. Section 10608.20 of the Water Code is amended to read:

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's ~~2017~~ *2016* report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its ~~internet website,~~ *Internet Web site,* and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

(2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

SEC. 6. Section 10608.48 of the Water Code is amended to read:

10608.48. (a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement both of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier’s pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The department shall require information about the implementation of efficient water management practices to be reported using a standardized form developed pursuant to Section 10608.52.

(f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

SEC. 7. *Chapter 9 (commencing with Section 10609) is added to Part 2.55 of Division 6 of the Water Code, to read:*

CHAPTER 9. Urban Water Use Objectives and Water Use Reporting

10609. *(a) The Legislature finds and declares that this chapter establishes a method to estimate the aggregate amount of water that would have been delivered the previous year by an urban retail water supplier if all that water had been used efficiently. This estimated aggregate water use is the urban retail water supplier's urban water use objective. The method is based on water use efficiency standards and local service area characteristics for that year. By comparing the amount of water actually used in the previous year with the urban water use objective, local urban water suppliers will be in a better position to help eliminate unnecessary use of water; that is, water used in excess of that needed to accomplish the intended beneficial use.*

(b) The Legislature further finds and declares all of the following:

(1) This chapter establishes standards and practices for the following water uses:

(A) Indoor residential use.

(B) Outdoor residential use.

(C) CII water use.

(D) Water losses.

(E) Other unique local uses and situations that can have a material effect on an urban water supplier's total water use.

(2) This chapter further does all of the following:

(A) Establishes a method to calculate each urban water use objective.

(B) Considers recycled water quality in establishing efficient irrigation standards.

(C) Requires the department to provide or otherwise identify data regarding the unique local conditions to support the calculation of an urban water use objective.

(D) Provides for the use of alternative sources of data if alternative sources are shown to be as accurate as, or more accurate than, the data provided by the department.

(E) Requires annual reporting of the previous year's water use with the urban water use objective.

(F) Provides a bonus incentive for the amount of potable recycled water used the previous year when comparing the previous year's water use with the urban water use objective, of up to 10 percent of the urban water use objective.

(3) This chapter requires the department and the board to solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter.

(4) This chapter preserves the Legislature's authority over long-term water use efficiency target setting and ensures appropriate legislative oversight of the implementation of this chapter by doing all of the following:

(A) Requiring the Legislative Analyst to conduct a review of the implementation of this act, including compliance with the adopted standards and regulations, accuracy of the data, use of alternate data, and other issues the Legislative Analyst deems appropriate.

(B) Stating legislative intent that the director of the department and the chairperson of the board appear before the appropriate Senate and Assembly policy committees to report on progress in implementing this chapter.

(C) Providing one-time-only authority to the department and board to adopt water use efficiency standards, except as explicitly provided in this chapter. Authorization to update the standards shall require separate legislation.

(c) It is the intent of the Legislature that the following principles apply to the development and implementation of long-term standards and urban water use objectives:

(1) Local urban retail water suppliers should have primary responsibility for meeting standards-based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.

(2) Long-term standards and urban water use objectives should advance the state's goals to mitigate and adapt to climate change.

(3) Long-term standards and urban water use objectives should acknowledge the shade, air quality, and heat-island reduction benefits provided to communities by trees through the support of water-efficient irrigation practices that keep trees healthy.

(4) The state should identify opportunities for streamlined reporting, eliminate redundant data submissions, and incentivize open access to data collected by urban and agricultural water suppliers.

10609.2. *(a) The board, in coordination with the department, shall adopt long-term standards for the efficient use of water pursuant to this chapter on or before June 30, 2022.*

(b) Standards shall be adopted for all of the following:

(1) Outdoor residential water use.

(2) Outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.

(3) A volume for water loss.

(c) When adopting the standards under this section, the board shall consider the policies of this chapter and the proposed efficiency standards' effects on local wastewater management, developed and natural parklands, and urban tree health. The standards and potential effects shall be identified by May 30, 2022. The board shall allow for public comment on potential effects identified by the board under this subdivision.

(d) The long-term standards shall be set at a level designed so that the water use objectives, together with other demands excluded from the long-term standards such as CII indoor water use and CII outdoor water use not connected to a dedicated landscape meter, would exceed the statewide conservation targets required pursuant to Chapter 3 (commencing with Section 10608.16).

(e) The board, in coordination with the department, shall adopt by regulation variances recommended by the department pursuant to Section 10609.14 and guidelines and methodologies pertaining to the calculation of an urban retail water supplier's urban water use objective recommended by the department pursuant to Section 10609.16.

10609.4. *(a) (1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily.*

(2) Beginning January 1, 2025, and until January 1, 2030, the standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b).

(b) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and may jointly recommend to the Legislature a standard for indoor residential water use that more appropriately reflects best practices for indoor residential water use than the standard described in subdivision (a). A report on the results of the studies and investigations shall be made to the chairpersons of the relevant policy committees of each house of the Legislature by January 1, 2021, and shall include information necessary to support the recommended standard, if there is one. The studies and investigations shall also include an analysis of the benefits and impacts of how the changing standard for indoor residential water use will impact water and wastewater management, including potable water usage, wastewater, recycling and reuse systems, infrastructure, operations, and supplies.

(2) The studies, investigations, and report described in paragraph (1) shall include collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, and water, wastewater, and recycled water agencies.

10609.6. *(a) (1) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor residential use for adoption by the board in accordance with this chapter.*

(2) (A) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(B) The standards shall apply to irrigable lands.

(C) The standards shall include provisions for swimming pools, spas, and other water features. Ornamental water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, shall be analyzed separately from swimming pools and spas.

(b) The department shall, by January 1, 2021, provide each urban retail water supplier with data regarding the area of residential irrigable lands in a manner that can reasonably be applied to the standards adopted pursuant to this section.

(c) The department shall not recommend standards pursuant to this section until it has conducted pilot projects or studies, or some combination of the two, to ensure that the data provided to local agencies are reasonably accurate for the data's intended uses, taking into consideration California's diverse landscapes and community characteristics.

10609.8. *(a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor irrigation of landscape areas with dedicated irrigation meters or other means of calculating outdoor irrigation use in connection with CII water use for adoption by the board in accordance with this chapter.*

(b) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).

(c) The standards shall include an exclusion for water for commercial agricultural use meeting the definition of subdivision (b) of Section 51201 of the Government Code.

10609.9. *For purposes of Sections 10609.6 and 10609.8, "principles of the model water efficient landscape ordinance" means those provisions of the model water efficient landscape ordinance applicable to the establishment or determination of the amount of water necessary to efficiently irrigate both new and existing landscapes. These provisions include, but are not limited to, all of the following:*

(a) Evapotranspiration adjustment factors, as applicable.

(b) Landscape area.

(c) Maximum applied water allowance.

(d) Reference evapotranspiration.

(e) Special landscape areas, including provisions governing evapotranspiration adjustment factors for different types of water used for irrigating the landscape.

10609.10. *(a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, performance measures for CII water use for adoption by the board in accordance with this chapter.*

(b) Prior to recommending performance measures for CII water use, the department shall solicit broad public participation from stakeholders and other interested persons relating to all of the following:

(1) Recommendations for a CII water use classification system for California that address significant uses of water.

(2) Recommendations for setting minimum size thresholds for converting mixed CII meters to dedicated irrigation meters, and evaluation of, and recommendations for, technologies that could be used in lieu of requiring dedicated irrigation meters.

(3) Recommendations for CII water use best management practices, which may include, but are not limited to, water audits and water management plans for those CII customers that exceed a recommended size, volume of water use, or other threshold.

(c) Recommendations of appropriate performance measures for CII water use shall be consistent with the October 21, 2013, report to the Legislature by the Commercial, Industrial, and Institutional Task Force entitled "Water Use Best Management Practices," including the technical and financial feasibility recommendations provided in that report, and shall support the economic productivity of California's commercial, industrial, and institutional sectors.

(d) (1) The board, in coordination with the department, shall adopt performance measures for CII water use on or before June 30, 2022.

(2) Each urban retail water supplier shall implement the performance measures adopted by the board pursuant to paragraph (1).

10609.12. *The standards for water loss for urban retail water suppliers shall be the standards adopted by the board pursuant to subdivision (i) of Section 10608.34.*

10609.14. *(a) The department, in coordination with the board, shall conduct necessary studies and investigations and, no later than October 1, 2021, recommend for adoption by the board in accordance with this chapter appropriate variances for unique uses that can have a material effect on an urban retail water supplier's urban water use objective.*

(b) Appropriate variances may include, but are not limited to, allowances for the following:

(1) Significant use of evaporative coolers.

(2) Significant populations of horses and other livestock.

(3) Significant fluctuations in seasonal populations.

(4) Significant landscaped areas irrigated with recycled water having high levels of total dissolved solids.

(5) Significant use of water for soil compaction and dust control.

(6) Significant use of water to supplement ponds and lakes to sustain wildlife.

(7) Significant use of water to irrigate vegetation for fire protection.

(8) Significant use of water for commercial or noncommercial agricultural use.

(c) The department, in recommending variances for adoption by the board, shall also recommend a threshold of significance for each recommended variance.

(d) Before including any specific variance in calculating an urban retail water supplier's water use objective, the urban retail water supplier shall request and receive approval by the board for the inclusion of that variance.

(e) The board shall post on its Internet Web site all of the following:

(1) A list of all urban retail water suppliers with approved variances.

(2) The specific variance or variances approved for each urban retail water supplier.

(3) The data supporting approval of each variance.

10609.15. *To help streamline water data reporting, the department and the board shall do all of the following:*

(a) Identify urban water reporting requirements shared by both agencies, and post on each agency's Internet Web site how the data is used for planning, regulatory, or other purposes.

(b) Analyze opportunities for more efficient publication of urban water reporting requirements within each agency, and analyze how each agency can integrate various data sets in a publicly accessible location, identify priority actions, and implement priority actions identified in the analysis.

(c) Make appropriate data pertaining to the urban water reporting requirements that are collected by either agency available to the public according to the principles and requirements of the Open and Transparent Water Data Act (Part 4.9 (commencing with Section 12400)).

10609.16. *The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, guidelines and methodologies for the board to adopt that identify how an urban retail water supplier calculates its urban water use objective. The guidelines and methodologies shall address, as necessary, all of the following:*

(a) Determining the irrigable lands within the urban retail water supplier's service area.

(b) Updating and revising methodologies described pursuant to subparagraph (A) of paragraph (1) of subdivision (h) of Section 10608.20, as appropriate, including methodologies for calculating the population in an urban retail water supplier's service area.

(c) Using landscape area data provided by the department or alternative data.

(d) Incorporating precipitation data and climate data into estimates of a urban retail water supplier's outdoor irrigation budget for its urban water use objective.

(e) Estimating changes in outdoor landscape area and population, and calculating the urban water use objective, for years when updated landscape imagery is not available from the department.

(f) Determining acceptable levels of accuracy for the supporting data, the urban water use objective, and compliance with the urban water use objective.

10609.18. *The department and the board shall solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter. The board shall hold at least one public meeting before taking any action on any standard or variance recommended by the department.*

SEC. 8. *Chapter 10 (commencing with Section 10609.40) is added to Part 2.55 of Division 6 of the Water Code, to read:*

CHAPTER 10. Countywide Drought and Water Shortage Contingency Plans

10609.40. *The Legislature finds and declares both of the following:*

(a) Small water suppliers and rural communities are often not covered by established water shortage planning requirements. Currently, most counties do not address water shortages or do so minimally in their general plan or the local hazard mitigation plan.

(b) The state should provide guidance to improve drought planning for small water suppliers and rural communities.

10609.42. *(a) No later than January 1, 2020, the department, in consultation with the board and other relevant state and local agencies and stakeholders, shall use available data to identify small water suppliers and rural communities that may be at risk of drought and water shortage vulnerability. The department shall notify counties and groundwater sustainability agencies of those suppliers or communities that may be at risk within its jurisdiction, and may make the information publicly accessible on its Internet Web site.*

(b) The department shall, in consultation with the board, by January 1, 2020, propose to the Governor and the Legislature recommendations and guidance relating to the development and implementation of countywide drought and water shortage contingency plans to address the planning needs of small water suppliers and rural communities. The department shall recommend how these plans can be included in county local hazard

mitigation plans or otherwise integrated with complementary existing planning processes. The guidance from the department shall outline goals of the countywide drought and water shortage contingency plans and recommend components including, but not limited to, all of the following:

(1) Assessment of drought vulnerability.

(2) Actions to reduce drought vulnerability.

(3) Response, financing, and local communication and outreach planning efforts that may be implemented in times of drought.

(4) Data needs and reporting.

(5) Roles and responsibilities of interested parties and coordination with other relevant water management planning efforts.

(c) In formulating the proposal, the department shall utilize a public process involving state agencies, cities, counties, small communities, small water suppliers, and other stakeholders.

SEC. 9. Section 10801 of the Water Code is amended to read:

10801. The Legislature finds and declares all of the following:

(a) The waters of the state are a limited and renewable resource.

(b) The California Constitution requires that water in the state be used in a reasonable and beneficial manner.

(c) The efficient use of agricultural water supplies is of great statewide concern.

(d) There is a great amount of reuse of delivered water, both inside and outside the water service areas of agricultural water suppliers.

(e) Significant noncrop beneficial uses are associated with agricultural water use, including the preservation and enhancement of fish and wildlife resources.

(f) Significant opportunities exist in some areas, through improved irrigation water management, to conserve water or to reduce the quantity of highly saline or toxic drainage water.

(g) Changes in water management practices should be carefully planned and implemented to minimize adverse effects on other beneficial uses currently being served.

(h) Agricultural water suppliers that receive water from the federal Central Valley Project are required by federal law to prepare and implement water conservation plans.

(i) Agricultural water users applying for a permit to appropriate water from the board are required to prepare and implement water conservation plans.

SEC. 10. Section 10802 of the Water Code is amended to read:

10802. The Legislature finds and declares that all of the following are the policies of the state:

(a) The efficient use of water shall be pursued actively to protect both the people of the state and the state's water resources.

(b) The efficient use of agricultural water supplies shall be an important criterion in public decisions with regard to water.

(c) Agricultural water suppliers shall be required to prepare water management plans to achieve greater efficiency in the use of water.

SEC. 11. Section 10814 of the Water Code is amended to read:

10814. "Person" has the same meaning as defined in Section 10614.

SEC. 12. Section 10817 of the Water Code is amended to read:

10817. "Water use efficiency" means the efficient management of water resources for beneficial uses, preventing waste, or accomplishing additional benefits with the same amount of water.

SEC. 13. Section 10820 of the Water Code is amended to read:

10820. (a) (1) Except as provided in paragraph (2), an agricultural water supplier shall prepare and adopt an agricultural water management plan in the manner set forth in this chapter on or before December 31, 2012, and shall update that plan on December 31, 2015.

(2) (A) The agricultural water management plan shall be updated on or before April 1, 2021, and thereafter on or before April 1 in the years ending in six and one. The plan shall satisfy the requirements of Section 10826.

(B) An agricultural water supplier shall submit its plan to the department no later than 30 days after the adoption of the plan. The plan shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) (1) The department shall review each plan that is due pursuant to paragraph (2) of subdivision (a). The department may coordinate its review with the Department of Food and Agriculture and the board.

(2) The department shall notify an agricultural water supplier that it is not in compliance with this part if the department determines that actions are required to comply with the requirements of this part or if a supplier fails to update a plan as provided in paragraph (2) of subdivision (a). The department shall identify the specific deficiencies and the supplier shall have 120 days to remedy an identified deficiency. The department may provide additional time to remedy a deficiency if it finds that a supplier is making substantial progress toward remedying the deficiency. An agricultural water supplier that fails to submit corrective actions or a completed plan shall not be in compliance with this part.

(3) If the department has not received a plan or the department has determined that the plan submitted does not comply with the requirements of this part, and a revised plan has not been submitted, the department may undertake the following actions:

(A) Contract with a state academic institution or qualified entity to prepare or complete an agricultural water management plan on behalf of the supplier. The costs and expenses related to preparation or completion of a plan, including the costs of the contract and contract administration, shall be recoverable by the department from the supplier.

(B) If a supplier does not provide data necessary for the preparation or completion of a plan to the department or the contracting entity as determined by the department in accordance with subparagraph (A), the department may assess a fine of one thousand dollars ($1,000) per day, not to exceed twenty-five thousand dollars ($25,000), until data is made available.

(4) (A) A plan prepared or completed pursuant to paragraph (3) shall be deemed the adopted plan for the supplier.

(B) Any action to challenge or invalidate the adequacy of the plan prepared or completed pursuant to paragraph (3) shall be brought against the supplier for whom the plan was prepared.

(c) Every supplier that becomes an agricultural water supplier after December 31, 2012, shall prepare and adopt an agricultural water management plan within one year after the date it has become an agricultural water supplier.

(d) A water supplier that indirectly provides water to customers for agricultural purposes shall not prepare a plan pursuant to this part without the consent of each agricultural water supplier that directly provides that water to its customers.

SEC. 14. Section 10825 of the Water Code is amended to read:

10825. (a) It is the intent of the Legislature in enacting this part to allow levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

(b) This part does not require the implementation of water use efficiency programs or practices that are not locally cost effective.

SEC. 15. Section 10826 of the Water Code is amended to read:

10826. An agricultural water management plan shall be adopted in accordance with this chapter. The plan shall do all of the following:

(a) Describe the agricultural water supplier and the service area, including all of the following:

(1) Size of the service area.

(2) Location of the service area and its water management facilities.

(3) Terrain and soils.

(4) Climate.

(5) Operating rules and regulations.

(6) Water delivery measurements or calculations.

(7) Water rate schedules and billing.

(8) Water shortage allocation policies.

(b) Describe the quantity and quality of water resources of the agricultural water supplier, including all of the following:

(1) Surface water supply.

(2) Groundwater supply.

(3) Other water supplies, including recycled water.

(4) Source water quality monitoring practices.

(5) Water uses within the agricultural water supplier's service area, including all of the following:

(A) Agricultural.

(B) Environmental.

(C) Recreational.

(D) Municipal and industrial.

(E) Groundwater recharge, including estimated flows from deep percolation from irrigation and seepage.

(c) Include an annual water budget based on the quantification of all inflow and outflow components for the service area of the agricultural water supplier. Components of inflow shall include surface inflow, groundwater pumping in the service area, and effective precipitation. Components of outflow shall include surface outflow, deep percolation, and evapotranspiration. An agricultural water supplier shall report the annual water budget on a water-year basis. The department shall provide tools and resources to assist agricultural water suppliers in developing and quantifying components necessary to develop a water budget.

(d) Include an analysis, based on available information, of the effect of climate change on future water supplies.

(e) Describe previous water management activities.

(f) Identify water management objectives based on the water budget to improve water system efficiency or to meet other water management objectives. The agricultural water supplier shall identify, prioritize, and implement actions to reduce water loss, improve water system management, and meet other water management objectives identified in the plan.

(g) Include in the plan information regarding efficient water management practices required pursuant to Section 10608.48.

(h) Quantify the efficiency of agricultural water use within the service area of the agricultural water supplier using the appropriate method or methods from among the four water use efficiency quantification methods developed by the department in the May 8, 2012, report to the Legislature entitled "A Proposed Methodology for

Quantifying the Efficiency of Agricultural Water Use." The agricultural water supplier shall account for all water uses, including crop water use, agronomic water use, environmental water use, and recoverable surface flows.

SEC. 16. *Section 10826.2 is added to the Water Code, to read:*

10826.2. *As part of its agricultural water management plan, each agricultural water supplier shall develop a drought plan for periods of limited water supply describing the actions of the agricultural water supplier for drought preparedness and management of water supplies and allocations during drought conditions. The drought plan shall contain both of the following:*

(a) Resilience planning, including all of the following:

(1) Data, indicators, and information needed to determine the water supply availability and levels of drought severity.

(2) Analyses and identification of potential vulnerability to drought.

(3) A description of the opportunities and constraints for improving drought resilience planning, including all of the following:

(A) The availability of new technology or information.

(B) The ability of the agricultural water supplier to obtain or use additional water supplies during drought conditions.

(C) A description of other actions planned for implementation to improve drought resilience.

(b) Drought response planning, including all of the following:

(1) Policies and a process for declaring a water shortage and for implementing water shortage allocations and related response actions.

(2) Methods and procedures for the enforcement or appeal of, or exemption from, triggered shortage response actions.

(3) Methods and procedures for monitoring and evaluation of the effectiveness of the drought plan.

(4) Communication protocols and procedures to inform and coordinate customers, the public, interested parties, and local, regional, and state government.

(5) A description of the potential impacts on the revenues, financial condition, and planned expenditures of the agricultural water supplier during drought conditions that reduce water allocations, and proposed measures to overcome those impacts, including reserve-level policies.

SEC. 17. Section 10843 of the Water Code is amended to read:

10843. (a) An agricultural water supplier shall submit to the entities identified in subdivision (b) a copy of its plan no later than 30 days after review of the plan pursuant to subdivision (b) of Section 10820.

(b) An agricultural water supplier shall submit a copy of its plan to each of the following entities:

(1) The department.

(2) Any city, county, or city and county within which the agricultural water supplier provides water supplies.

(3) Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.

(4) The California State Library.

SEC. 18. Section 10845 of the Water Code is amended to read:

10845. (a) The department shall prepare and submit to the Legislature, on or before April 30, 2022, and thereafter in the years ending in seven and years ending in two, a report summarizing the status of the plans adopted pursuant to this part.

(b) The report prepared by the department shall identify the outstanding elements of any plan adopted pursuant to this part. The report shall include an evaluation of the effectiveness of this part in promoting efficient agricultural water management practices and recommendations relating to proposed changes to this part, as appropriate.

(c) The department shall provide a copy of the report to each agricultural water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearing designed to consider the effectiveness of plans submitted pursuant to this part.

(d) This section does not authorize the department, in preparing the report, to approve, disapprove, or critique individual plans submitted pursuant to this part.

SEC. 19. Section 10910 of the Water Code is amended to read:

10910. (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system whose service area includes the project site and any water system adjacent to the project site that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined in Section 10912, that may supply water for the project. If the city or county is not able to identify any public water system that may supply water for the project, the city or county shall prepare the water assessment required by this part after consulting with any entity serving domestic water supplies whose service area includes the project site, the local agency formation commission, and any public water system adjacent to the project site.

(c) (1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system’s total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system’s existing and planned future uses, including agricultural and manufacturing uses.

(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

(d) (1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts.

(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:

(A) Written contracts or other proof of entitlement to an identified water supply.

(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.

(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.

(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.

(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contractholders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.

(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment:

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2) (A) A description of any groundwater basin or basins from which the proposed project will be supplied.

(B) For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree.

(C) For a basin that has not been adjudicated that is a basin designated as high- or medium-priority pursuant to Section 10722.4, information regarding the following:

(i) Whether the department has identified the basin as being subject to critical conditions of overdraft pursuant to Section 12924.

(ii) If a groundwater sustainability agency has adopted a groundwater sustainability plan or has an approved alternative, a copy of that alternative or plan.

(D) For a basin that has not been adjudicated that is a basin designated as low- or very low priority pursuant to Section 10722.4, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water supply assessment shall not be required to include the information required by this paragraph if the public water system

determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by subparagraph (D) of paragraph (4) of subdivision (b) of Section 10631.

(g) (1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.

(2) Prior to the expiration of the 90-day period, if the public water system intends to request an extension of time to prepare and adopt the assessment, the public water system shall meet with the city or county to request an extension of time, which shall not exceed 30 days, to prepare and adopt the assessment.

(3) If the public water system fails to request an extension of time, or fails to submit the assessment notwithstanding the extension of time granted pursuant to paragraph (2), the city or county may seek a writ of mandamus to compel the governing body of the public water system to comply with the requirements of this part relating to the submission of the water supply assessment.

(h) Notwithstanding any other provision of this part, if a project has been the subject of a water supply assessment that complies with the requirements of this part, no additional water supply assessment shall be required for subsequent projects that were part of a larger project for which a water supply assessment was completed and that has complied with the requirements of this part and for which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has concluded that its water supplies are sufficient to meet the projected water demand associated with the proposed project, in addition to the existing and planned future uses, including, but not limited to, agricultural and industrial uses, unless one or more of the following changes occurs:

(1) Changes in the project that result in a substantial increase in water demand for the project.

(2) Changes in the circumstances or conditions substantially affecting the ability of the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), to provide a sufficient supply of water for the project.

(3) Significant new information becomes available that was not known and could not have been known at the time when the assessment was prepared.

(i) For the purposes of this section, hauled water is not considered as a source of water.

SEC. 20. *This act shall become operative only if Senate Bill 606 of the 2017–18 Regular Session is enacted and becomes effective.*

SB-606 Water management planning. (2017-2018)

As Amends the Law Today | **As Amends the Law on Nov 08, 2018**

SECTION 1. Section 350 of the Water Code is amended to read:

350. The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.

SEC. 2. Section 377 of the Water Code is amended to read:

377. (a) From and after the publication or posting of any ordinance or resolution pursuant to Section 376, a violation of a requirement of a water conservation program adopted pursuant to Section 376 is a misdemeanor. A person convicted under this subdivision shall be punished by imprisonment in the county jail for not more than 30 days, or by a fine not exceeding one thousand dollars ($1,000), or by both.

(b) A court or public entity may hold a person civilly liable in an amount not to exceed ten thousand dollars ($10,000) for a violation of any of the following:

(1) An ordinance or resolution adopted pursuant to Section 376.

(2) A regulation adopted by the board under Section 1058.5 or Chapter 9 (commencing with Section 10609) of Part 2.55 of Division 6, unless the board regulation provides that it cannot be enforced under this section or provides for a lesser applicable maximum penalty.

(c) Commencing on the 31st day after the public entity notified a person of a violation described in subdivision (b), the person additionally may be civilly liable in an amount not to exceed ten thousand dollars ($10,000) plus five hundred dollars ($500) for each additional day on which the violation continues.

(d) Remedies prescribed in this section are cumulative and not alternative, except that no liability shall be recoverable under this section for any violation of paragraph (2) of subdivision (b) if the board has filed a complaint pursuant to Section 1846 alleging the same violation.

(e) A public entity may administratively impose the civil liability described in subdivisions (b) and (c) after providing notice and an opportunity for a hearing. The public entity shall initiate a proceeding under this subdivision by a complaint issued pursuant to Section 377.5. The public entity shall issue the complaint at least 30 days before the hearing on the complaint and the complaint shall state the basis for the proposed civil liability order.

(f) (1) In determining the amount of civil liability to assess, a court or public entity shall take into consideration all relevant circumstances, including, but not limited to, the nature and persistence of the violation, the extent of the harm caused by the violation, the length of time over which the violation occurs, and any corrective action taken by the violator.

(2) The civil liability calculated pursuant to paragraph (1) for the first violation of subdivision (b) by a residential water user shall not exceed one thousand dollars ($1,000) except in extraordinary situations where the court or public entity finds all of the following:

(A) The residential user had actual notice of the requirement found to be violated.

(B) The conduct was intentional.

(C) The amount of water involved was substantial.

(g) Civil liability imposed pursuant to this section shall be paid to the public entity and expended solely for the purposes of this chapter.

(h) An order setting administrative civil liability shall become effective and final upon issuance of the order and payment shall be made. Judicial review of any final order shall be pursuant to Section 1094.5 of the Code of Civil Procedure.

(i) In addition to the remedies prescribed in this section, a public entity may enforce water use limitations established by an ordinance or resolution adopted pursuant to this chapter, or as otherwise authorized by law, by a volumetric penalty in an amount established by the public entity.

SEC. 3. Section 1058.5 of the Water Code is amended to read:

1058.5. (a) This section applies to any emergency regulation adopted by the board for which the board makes both of the following findings:

(1) The emergency regulation is adopted to prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation, to require curtailment of diversions when water is not available under the diverter's priority of right, or in furtherance of any of the foregoing, to require reporting of diversion or use or the preparation of monitoring reports.

(2) The emergency regulation is adopted in response to conditions which exist, or are threatened, in a critically dry year immediately preceded by two or more consecutive below normal, dry, or critically dry years or during a period for which the Governor has issued a proclamation of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions.

(b) Notwithstanding Sections 11346.1 and 11349.6 of the Government Code, any findings of emergency adopted by the board, in connection with the adoption of an emergency regulation under this section, are not subject to review by the Office of Administrative Law.

(c) An emergency regulation adopted by the board under this section may remain in effect for up to one year, as determined by the board, and is deemed repealed immediately upon a finding by the board that due to changed conditions it is no longer necessary for the regulation to remain in effect. An emergency regulation adopted by the board under this section may be renewed if the board determines that the conditions specified in paragraph (2) of subdivision (a) are still in effect.

(d) In addition to any other applicable civil or criminal penalties, any person or entity ~~that~~ *who* violates a regulation adopted by the board pursuant to this section is guilty of an infraction punishable by a fine of up to five hundred dollars ($500) for each day in which the violation occurs.

(e) (1) Notwithstanding subdivision (b) of Section 1551 or subdivision (e) of Section 1848, a civil liability imposed under Chapter 12 (commencing with Section 1825) of Part 2 of Division 2 by the board or a court for a violation of an emergency conservation regulation adopted pursuant to this section shall be deposited, and separately accounted for, in the Water Rights Fund. Funds deposited in accordance with this subdivision shall be available, upon appropriation, for water conservation activities and programs.

(2) For purposes of this subdivision, an "emergency conservation regulation" means an emergency regulation that requires an end user of water, a water retailer, or a water wholesaler to conserve water or report to the board on water conservation. Water conservation includes restrictions or limitations on particular uses of water or a reduction in the amount of water used or served, but does not include curtailment of diversions when water is not available under the diverter's priority of right or reporting requirements related to curtailments.

SEC. 4. Section 1120 of the Water Code is amended to read:

1120. This chapter applies to any decision or order issued under this part or Section 275, Part 2 (commencing with Section 1200), Part 2 (commencing with Section 10500) of Division 6, Part 2.55 (commencing with Section 10608) of Division 6, or Chapter 11 (commencing with Section 10735) of Part 2.74 of Division 6, Article 7 (commencing with Section 13550) of Chapter 7 of Division 7, or the public trust doctrine.

SEC. 5. Section 10608.12 of the Water Code is amended to read:

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "CII water use" means water used by commercial water users, industrial water users, institutional water users, and large landscape water users.

(e) "Commercial water user" means a water user that provides or distributes a product or service.

(f) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(g) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(h) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(i) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(j) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(k) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(l) "Large landscape" means a nonresidential landscape as described in the performance measures for CII water use adopted pursuant to Section 10609.10.

(m) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(n) "Performance measures" means actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users. Performance measures may include, but are not limited to, educating CII water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not include process water.

(o) "Potable reuse" means direct potable reuse, indirect potable reuse for groundwater recharge, and reservoir water augmentation as those terms are defined in Section 13561.

(p) "Process water" means water used by industrial water users for producing a product or product content or water used for research and development. Process water includes, but is not limited to, continuous manufacturing processes, and water used for testing, cleaning, and maintaining equipment. Water used to cool machinery or buildings used in the manufacturing process or necessary to maintain product quality or chemical characteristics for product manufacturing or control rooms, data centers, laboratories, clean rooms, and other industrial facility units that are integral to the manufacturing or research and development process is process water. Water used in the manufacturing process that is necessary for complying with local, state, and federal health and safety laws, and is not incidental water, is process water. Process water does not mean incidental water uses.

(q) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050.

(r) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(s) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(t) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(u) "Urban water use objective" means an estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, as described in Section 10609.20.

(v) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(w) "Urban wholesale water ~~supplier"~~ *supplier,"* means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

SEC. 6. Section 10608.20 of the Water Code is amended to read:

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's ~~2017~~ *2016* report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its ~~internet website,~~ *Internet Web site,* and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

(2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

SEC. 7. *Section 10608.35 is added to the Water Code, to read:*

10608.35. *(a) The department, in coordination with the board, shall conduct necessary studies and investigations and make a recommendation to the Legislature, by January 1, 2020, on the feasibility of developing and enacting water loss reporting requirements for urban wholesale water suppliers.*

(b) The studies and investigations shall include an evaluation of the suitability of applying the processes and requirements of Section 10608.34 to urban wholesale water suppliers.

(c) In conducting necessary studies and investigations and developing its recommendation, the department shall solicit broad public participation from stakeholders and other interested persons.

SEC. 8. *Section 10609.20 is added to the Water Code, immediately following Section 10609.18, to read:*

10609.20. *(a) Each urban retail water supplier shall calculate its urban water use objective no later than November 1, 2023, and by November 1 every year thereafter.*

(b) The calculation shall be based on the urban retail water supplier's water use conditions for the previous calendar or fiscal year.

(c) Each urban water supplier's urban water use objective shall be composed of the sum of the following:

(1) Aggregate estimated efficient indoor residential water use.

(2) Aggregate estimated efficient outdoor residential water use.

(3) Aggregate estimated efficient outdoor irrigation of landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use.

(4) Aggregate estimated efficient water losses.

(5) Aggregate estimated water use in accordance with variances, as appropriate.

(d) (1) An urban retail water supplier that delivers water from a groundwater basin, reservoir, or other source that is augmented by potable reuse water may adjust its urban water use objective by a bonus incentive calculated pursuant to this subdivision.

(2) The water use objective bonus incentive shall be the volume of its potable reuse delivered to residential water users and to landscape areas with dedicated irrigation meters in connection with CII water use, on an acre-foot basis.

(3) The bonus incentive pursuant to paragraph (1) shall be limited in accordance with one of the following:

(A) The bonus incentive shall not exceed 15 percent of the urban water supplier's water use objective for any potable reuse water produced at an existing facility.

(B) The bonus incentive shall not exceed 10 percent of the urban water supplier's water use objective for any potable reuse water produced at any facility that is not an existing facility.

(4) For purposes of this subdivision, "existing facility" means a facility that meets all of the following:

(A) The facility has a certified environmental impact report, mitigated negative declaration, or negative declaration on or before January 1, 2019.

(B) The facility begins producing and delivering potable reuse water on or before January 1, 2022.

(C) The facility uses microfiltration and reverse osmosis technologies to produce the potable reuse water.

(e) (1) The calculation of the urban water use objective shall be made using landscape area and other data provided by the department and pursuant to the standards, guidelines, and methodologies adopted by the board. The department shall provide data to the urban water supplier at a level of detail sufficient to allow the urban water supplier to verify its accuracy at the parcel level.

(2) Notwithstanding paragraph (1), an urban retail water supplier may use alternative data in calculating the urban water use objective if the supplier demonstrates to the department that the alternative data are equivalent, or superior, in quality and accuracy to the data provided by the department. The department may provide technical assistance to an urban retail water supplier in evaluating whether the alternative data are appropriate for use in calculating the supplier's urban water use objective.

SEC. 9. *Section 10609.22 is added to the Water Code, to read:*

10609.22. *(a) An urban retail water supplier shall calculate its actual urban water use no later than November 1, 2023, and by November 1 every year thereafter.*

(b) The calculation shall be based on the urban retail water supplier's water use for the previous calendar or fiscal year.

(c) Each urban water supplier's urban water use shall be composed of the sum of the following:

(1) Aggregate residential water use.

(2) Aggregate outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.

(3) Aggregate water losses.

SEC. 10. *Section 10609.24 is added to the Water Code, to read:*

10609.24. *(a) An urban retail water supplier shall submit a report to the department no later than November 1, 2023, and by November 1 every year thereafter. The report shall include all of the following:*

(1) The urban water use objective calculated pursuant to Section 10609.20 along with relevant supporting data.

(2) The actual urban water use calculated pursuant to Section 10609.22 along with relevant supporting data.

(3) Documentation of the implementation of the performance measures for CII water use.

(4) A description of the progress made towards meeting the urban water use objective.

(b) The department shall post the reports and information on its Internet Web site.

(c) The board may issue an information order or conservation order to, or impose civil liability on, an entity or individual for failure to submit a report required by this section.

SEC. 11. *Section 10609.26 is added to the Water Code, to read:*

10609.26. *(a) (1) On and after November 1, 2023, the board may issue informational orders pertaining to water production, water use, and water conservation to an urban retail water supplier that does not meet its urban water use objective required by this chapter. Informational orders are intended to obtain information on supplier activities, water production, and conservation efforts in order to identify technical assistance needs and assist urban water suppliers in meeting their urban water use objectives.*

(2) In determining whether to issue an informational order, the board shall consider the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet the urban water use objective.

(3) The board shall share information received pursuant to this subdivision with the department.

(4) An urban water supplier may request technical assistance from the department. The technical assistance may, to the extent available, include guidance documents, tools, and data.

(b) On and after November 1, 2024, the board may issue a written notice to an urban retail water supplier that does not meet its urban water use objective required by this chapter. The written notice may warn the urban retail water supplier that it is not meeting its urban water use objective described in Section 10609.20 and is not making adequate progress in meeting the urban water use objective, and may request that the urban retail water supplier address areas of concern in its next annual report required by Section 10609.24. In deciding whether to issue a written notice, the board may consider whether the urban retail water supplier has received an informational order, the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet its urban water use objective.

(c) (1) On and after November 1, 2025, the board may issue a conservation order to an urban retail water supplier that does not meet its urban water use objective. A conservation order may consist of, but is not limited to, referral to the department for technical assistance, requirements for education and outreach, requirements for local enforcement, and other efforts to assist urban retail water suppliers in meeting their urban water use objective.

(2) In issuing a conservation order, the board shall identify specific deficiencies in an urban retail water supplier's progress towards meeting its urban water use objective, and identify specific actions to address the deficiencies.

(3) The board may request that the department provide an urban retail water supplier with technical assistance to support the urban retail water supplier's actions to remedy the deficiencies.

(d) A conservation order issued in accordance with this chapter may include requiring actions intended to increase water-use efficiency, but shall not curtail or otherwise limit the exercise of a water right, nor shall it require the imposition of civil liability pursuant to Section 377.

SEC. 12. *Section 10609.28 is added to the Water Code, to read:*

10609.28. *The board may issue a regulation or informational order requiring a wholesale water supplier, an urban retail water supplier, or a distributor of a public water supply, as that term is used in Section 350, to provide a monthly report relating to water production, water use, or water conservation.*

SEC. 13. *Section 10609.30 is added to the Water Code, to read:*

10609.30. *On or before January 10, 2024, the Legislative Analyst shall provide to the appropriate policy committees of both houses of the Legislature and the public a report evaluating the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. The board and the department shall provide the Legislative Analyst with the available data to complete this report.*

(a) The report shall describe all of the following:

(1) The rate at which urban retail water users are complying with the standards, and factors that might facilitate or impede their compliance.

(2) The accuracy of the data and estimates being used to calculate urban water use objectives.

(3) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.

(4) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.

(5) The early indications of how implementing this chapter might impact the efficiency of statewide urban water use.

(6) Recommendations, if any, for improving statewide urban water use efficiency and the standards and practices described in this chapter.

(7) Any other issues the Legislative Analyst deems appropriate.

SEC. 14. *Section 10609.32 is added to the Water Code, to read:*

10609.32. *It is the intent of the Legislature that the chairperson of the board and the director of the department appear before the appropriate policy committees of both houses of the Legislature on or around January 1, 2026, and report on the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. It is the intent of the Legislature that the topics to be covered include all of the following:*

(a) The rate at which urban retail water suppliers are complying with the standards, and factors that might facilitate or impede their compliance.

(b) What enforcement actions have been taken, if any.

(c) The accuracy of the data and estimates being used to calculate urban water use objectives.

(d) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.

(e) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.

(f) An assessment of how implementing this chapter is affecting the efficiency of statewide urban water use.

SEC. 15. *Section 10609.34 is added to the Water Code, to read:*

10609.34. *Notwithstanding Section 15300.2 of Title 14 of the California Code of Regulations, an action of the board taken under this chapter shall be deemed to be a Class 8 action, within the meaning of Section 15308 of Title 14 of the California Code of Regulations, provided that the action does not involve relaxation of existing water conservation or water use standards.*

SEC. 16. *Section 10609.36 is added to the Water Code, to read:*

10609.36. *(a) Nothing in this chapter shall be construed to determine or alter water rights. Sections 1010 and 1011 apply to water conserved through implementation of this chapter.*

(b) Nothing in this chapter shall be construed to authorize the board to update or revise water use efficiency standards authorized by this chapter except as explicitly provided in this chapter. Authorization to update the standards beyond that explicitly provided in this chapter shall require separate legislation.

(c) Nothing in this chapter shall be construed to limit or otherwise affect the use of recycled water as seawater barriers for groundwater salinity management.

SEC. 17. *Section 10609.38 is added to the Water Code, to read:*

10609.38. The board may waive the requirements of this chapter for a period of up to five years for any urban retail water supplier whose water deliveries are significantly affected by changes in water use as a result of damage from a disaster such as an earthquake or fire. In establishing the period of a waiver, the board shall take into consideration the breadth of the damage and the time necessary for the damaged areas to recover from the disaster.

SEC. 18. Section 10610.2 of the Water Code is amended to read:

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

SEC. 19. Section 10610.4 of the Water Code is amended to read:

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to achieve the efficient use of available supplies and strengthen local drought planning.

SEC. 20. Section 10612 of the Water Code is amended and renumbered to read:

~~**10612.**~~ *10611.3.* ~~"Drought risk assessment"~~ *"Customer"* means a ~~method that examines water shortage risks based on the driest five-year historic sequence for the agency's water supply, as described in subdivision (b) of Section 10635.~~ *purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.*

SEC. 21. *Section 10612 is added to the Water Code, to read:*

10612. *"Drought risk assessment" means a method that examines water shortage risks based on the driest five-year historic sequence for the agency's water supply, as described in subdivision (b) of Section 10635.*

SEC. 22. *Section 10617.5 is added to the Water Code, to read:*

10617.5. *"Water shortage contingency plan" means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.*

SEC. 23. *Section 10618 is added to the Water Code, to read:*

10618. *"Water supply and demand assessment" means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.*

SEC. 24. Section 10620 of the Water Code is amended to read:

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation, efficient water use, and improved local drought resilience.

(2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.

(3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

SEC. 25. Section 10621 of the Water Code is amended to read:

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.

(d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

(e) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

(f) *(1)* Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

(2) By January 1, 2024, each urban retail water supplier shall adopt and submit to the department a supplement to the adopted 2020 plan that includes information required pursuant to subparagraph (B) of paragraph (1) of subdivision (e) of Section 10631. This supplement is not an update or an amendment to the plan and, therefore, an urban water supplier is not required to comply with the public notice, hearing, and adoption requirements of Section 10642 before submitting the information to the department.

SEC. 26. Section 10630 of the Water Code is amended to read:

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.

SEC. 27. *Section 10630.5 is added to the Water Code, to read:*

10630.5. *Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.*

SEC. 28. Section 10631 of the Water Code is amended to read:

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

(3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(D) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(d) (1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) (A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

(4) (A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) For the supplement required of urban retail water suppliers by paragraph (2) of subdivision (f) of Section 10621, a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027, pursuant to Chapter 9 (commencing with Section 10609) of Part 2.55.

~~(B)~~ *(C)* The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph ~~(B)~~ *(C)* of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

SEC. 29. Section 10631.2 of the Water Code is amended to read:

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

SEC. 30. Section 10631.7 of the Water Code is repealed.

SEC. 31. Section 10632 of the Water Code is repealed.

~~**10632.** (a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:~~

~~(1) The analysis of water supply reliability conducted pursuant to Section 10635.~~

~~(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:~~

~~(A) The written decisionmaking process that an urban water supplier will use each year to determine its water supply reliability.~~

~~(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:~~

~~(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.~~

~~(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.~~

~~(iii) Existing infrastructure capabilities and plausible constraints.~~

~~(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.~~

~~(v) A description and quantification of each source of water supply.~~

~~(3) (A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.~~

~~(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.~~

~~(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:~~

~~(A) Locally appropriate supply augmentation actions.~~

~~(B) Locally appropriate demand reduction actions to adequately respond to shortages.~~

~~(C) Locally appropriate operational changes.~~

~~(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.~~

~~(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.~~

~~(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:~~

~~(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.~~

~~(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.~~

~~(C) Any other relevant communications.~~

~~(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.~~

~~(7) (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.~~

~~(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.~~

~~(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.~~

~~(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:~~

~~(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).~~

~~(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).~~

~~(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.~~

~~(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.~~

~~(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.~~

~~(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes,~~

~~waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.~~

~~(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.~~

SEC. 32. *Section 10632 is added to the Water Code, to read:*

10632. *(a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:*

(1) The analysis of water supply reliability conducted pursuant to Section 10635.

(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decisionmaking process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

(3) (A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

(7) (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

SEC. 33. *Section 10632.1 is added to the Water Code, to read:*

10632.1. *An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before June 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by June 1 of each year, whichever is later.*

SEC. 34. *Section 10632.2 is added to the Water Code, to read:*

10632.2. *An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative*

actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

SEC. 35. *Section 10632.3 is added to the Water Code, to read:*

10632.3. *It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.*

SEC. 36. Section 10635 of the Water Code is amended to read:

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

(c) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(d) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(e) Nothing in this article is intended to change existing law concerning an urban water supplier’s obligation to provide water service to its existing customers or to any potential future customers.

SEC. 37. Section 10640 of the Water Code is amended to read:

10640. (a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water

shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

SEC. 38. Section 10641 of the Water Code is amended to read:

10641. An urban water supplier required to prepare a plan or a water shortage contingency plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

SEC. 39. Section 10642 of the Water Code is amended to read:

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

SEC. 40. Section 10644 of the Water Code is amended to read:

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

(c) (1) (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before July 1, in the years ending in seven and two, a report summarizing the status of the plans and water shortage contingency plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans and water shortage contingency plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan and water shortage contingency plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans and water shortage contingency plans submitted pursuant to this part.

(B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.

(C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.

(2) A report to be submitted pursuant to subparagraph (A) of paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(d) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

SEC. 41. Section 10645 of the Water Code is amended to read:

10645. (a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

SEC. 42. Section 10650 of the Water Code is amended to read:

10650. Any actions or proceedings, other than actions by the board, to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan or a water shortage contingency plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan or water shortage contingency plan, or action taken pursuant to either, does not comply with this part shall be commenced within 90 days after filing of the plan or water shortage contingency plan or an amendment to either pursuant to Section 10644 or the taking of that action.

SEC. 43. Section 10651 of the Water Code is amended to read:

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan or a water shortage contingency plan, or an action taken pursuant to either by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

SEC. 44. Section 10653 of the Water Code is amended to read:

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the board and the Public Utilities Commission, for the preparation of water management plans, water shortage contingency plans, or conservation plans; provided, that if the board or the Public Utilities Commission requires additional information concerning water conservation, drought response measures, or financial conditions to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan that complies with analogous federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

SEC. 45. Section 10654 of the Water Code is amended to read:

10654. An urban water supplier may recover in its rates the costs incurred in preparing its urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency plan and implementing the reasonable water conservation measures included in either of the plans.

SEC. 46. Section 10656 of the Water Code is amended to read:

10656. An urban water supplier is not eligible for a water grant or loan awarded or administered by the state unless the urban water supplier complies with this part.

SEC. 47. *Section 10657 is added to the Water Code, to read:*

10657. *The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement this part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.*

SEC. 48. *This act shall become operative only if Assembly Bill 1668 of the 2017–18 Regular Session is enacted and becomes effective.*

Appendix B

AWE Model Assumptions

AWE CONSERVATION TRACKING TOOL: COMMON ASSUMPTIONS WORKSHEET

Getting Started: On this worksheet you enter information the tracking tool needs to operate. This includes specifying whether to use English or Metric units, setting up customer classes, specifying the first year for forecasts, entering forecasted population, housing, and customer accounts, setting financial assumptions, providing information needed to calculate water and energy savings due to appliance and plumbing standards for toilets, clothes washers, and dishwashers, and providing information needed to calculate water savings for landscape conservation measures included in the conservation measure

Scenario '"Empty" loaded into model on 7/27/2

State	CA
Volume Units	Acre-Feet (AF)

Model will use CA plumbing standards	
Flow Units Will Be:	MGD

Population, Housing, and Account Forecasts

new WU data - DU scaled based on ABAG Pop, 2025-2045 Sector scaled based on ABAG Pop and Employment, 2020 sectors based on pop only

Enter Starting Year for Forecasts: 2010

Population & Housing	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Population	183,716	191,575	191,269	197,939	201,987	204,750	208,324	211,961
Single Family Dwelling Units	55,038	55,291	55,202	57,127	58,296	59,093	60,125	61,174
Multi Family Dwelling Units	26,036	26,338	26,296	27,213	27,769	28,149	28,640	29,140
Number of Accounts								
Single Family	51,241	51,474	51,392	52,410	53,482	54,214	55,160	56,123
Multi Family	3,778	3,801	3,795	3,857	3,936	3,990	4,060	4,130
CII	3,479	3,476	3,470	3,495	3,553	3,581	3,589	3,597
Irrigation	838	850	849	866	881	888	890	892
Other	479	442	441	495	503	507	508	509
Not in use								
Not in use								
Not in use								
Not in use								

Business/Industrial + Institutional = CII

Financial Assumptions

These inputs are used by the tracking tool to standardize costs and benefits, calculate present values, and estimate utility and customer benefits of conservation.

Dollar Base Year	2019
Annual Inflation Rate	3.0%
Nominal Interest Rate	2.3%

Utility Rates in 2010	**Average Class Rate (2019 Dollars)**				**Annual Rate of Increase**			
	Water	Sewer	Electricity	Gas	Water	Sewer	Electricity	Gas

Customer Class	($/Thou Gal)	($/Thou Gal)	($/KWh)	($/Therm)	(%/Yr)	(%/Yr)	(%/Yr)	(%/Yr)
Single Family	$10.36		$0.28	$2.00	4.0%		3.0%	3.0%
Multi Family	$7.42		$0.28	$2.00	4.0%		3.0%	3.0%
CII	$11.51		$0.24	$0.80	4.0%		3.0%	3.0%
Irrigation	$12.77		$0.31		4.0%		3.0%	3.0%
Other					4.0%		3.0%	3.0%
Not in use								
Not in use								
Not in use								
Not in use								

Information Needed to Calculate Water/Energy Savings from Plumbing/Appliance Standards

These inputs are used by the tracking tool to estimate water and energy savings for national toilet and showerhead standards, which first took effect in 1994, and clothes washer and dishwasher appliance standards, which first included maximum allowable water factors in 2011 and 2010, respectively. Toilet standards took effect in 1992 in California and Texas.

	Single Family	Multi Family
Persons per household	2.4	2.40
Full Baths/Dwelling Unit	2.01	1.68
Half Baths/Dwelling Unit	0.24	0.59
Dwellling Units in 1992	50,156	23,953

Population in 1990 164,249

Information Needed to Calculate Water Savings for Landscape Measures in Library

Average landscape water use for residential and non-residential sites is used by the model to calculate water savings for various landscape conservation measures included in the program library. Average landscape water use is calculated using the following equation. Alternatively, you can use your own landscape water use estimate by selecting the "Use My Own Estimate" option.

$$use\ per\ site = \left(\frac{1}{irr.eff.}\right) \times (ET_0 \times K_L - R_e)\ \times Area \times C_v, where$$

$irr.eff. = typical\ irrigation\ efficiency$
$ET_0 = reference\ evapotranspiration$
$K_L = landscape\ coefficient\ (\%\ of ET_0\ needed\ by\ crop)$
$R_e = effective\ rainfall\ (\%\ of\ annual\ rainfall\ contributing\ to\ plant\ water\ requirement)$
$C_v = coefficient\ that\ converts\ water\ use\ to\ appropriate\ volume\ units\ (gal\ for\ english\ units, M^3 for\ metric\ units)$

○ Use my own landscape water use estimates ◉ Use model's landscape water use calculator

Reference ET in/yr 45.20

Avg Annual Rainfall	in/yr	47.41
Effective Rainfall	%	25%

Landscape Water Requirement Coefficient (K_L)

Turf	% of ET_0	80%
Other than turf	% of ET_0	40%

		Residential	Non Residential
Avg Landscape Area Per Site	ft^2		
Avg Turf Area (% of Total)	%		
Avg Irrigation Efficiency (%)	%	75%	75%

Irrigation Requirement		Residential	Non Residential
Turf Area	in/ft^2/yr	32	32
Other	in/ft^2/yr	8	8

Avg Landscape Water Use Per Site		Residential	Non Residential
Turf Area	Gal/Yr	0	0
Other	Gal/Yr	0	0
Total	Gal/Yr	**0**	**0**

AWE CONSERVATION TRACKING TOOL: ENTER UTILITY AVOIDED COSTS WORKSHEET

Enter utility avoided costs: The primary benefit of conservation to the utility and its ratepayers is avoiding future water supply and wastewater costs. A utility avoids cost by not having to purchase (or otherwise acquire), transport, treat and distribute water supply, and by not having to collect, treat, and dispose of wastewater. The variable costs of these activities are major components of avoided cost. Conservation, if done at sufficient scale, may also allow the utility to defer or even entirely avoid future expansion of system capacity. This can be a major source of benefit in some cases.

The tracking tool comes with a calculator you can use to estimate your avoided costs. Alternatively, you can enter you own avoided cost estimates by selecting

Scenario '"Empty" loaded into model on 7/27/2016 5:44:04 PM

Download CUWCC Avoided Cost & Environmental Benefits Models

○ Use my own avoided cost estimates ◉ Use model's avoided cost calculator

Tracking Tool Utility Avoided Cost Calculator

Water and Wastewater System Variable Costs (2019 Dollars)

	Water		Wastewater	
	$/AF	Nominal Increase	$/AF	Nominal Increase
Water purchase	$1,151	5.0%	NA	NA
Energy	$115	3.0%		
Chemicals	$50	3.0%		
Other variable cost				
Total	**$1,316**	**4.8%**	**$0**	**0.0%**

Variable Cost Forecast

Variable Cost	Units	2010	2015	2020	2025	2030	2035	2040	2045	2040-2045 Ann Grwth %
Water Supply	$/AF	$1,316	$1,435	$1,564	$1,705	$1,858	$2,026	$2,208	$2,407	1.7%
Wastewater	$/AF	$0	$0	$0	$0	$0	$0	$0	$0	0.0%

AWE CONSERVATION TRACKING TOOL: DEFINE CONSERVATION ACTIVITIES WORKSHEET

Define conservation activities: Click the Define/Edit/Delete button to setup and edit conservation activities. You can use the form to define your own activities or import activities from the tracking tool's library. Once imported, library activities can be customized. Conservation activity specifications are stored in a table on this worksheet. This table is hidden by default. You can unhide the table by clicking the "Show Activities Table" button. You can edit activities directly in the table if you find this easier than using the form. HOWEVER, DO NOT DELETE TABLE ROWS. ONLY USE THE FORM TO DELETE CONSERVATION ACTIVITIES.

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NOTE: You can define activities in the table rather than using the form. BUT ONLY USE THE FORM TO DELETE ACTIVITIES.

Activity ID	Activity Name	Class	Savings, Per Unit (gpy)	Savings, Annual Rate of Decay (%)	Savings, Peak Period (% of Annual Savings)	Savings, Useful Life (yrs)	Savings, Participant Free Riders (% of Participants)	Utility Costs, Year Denominated	Utility Costs, Initial Fixed ($)	Utility Costs, Initial Variable ($/unit)	Utility Costs, Years of Follow-up (yrs)	Utility Costs, Follow-up Fixed ($/yr)	Utility Costs, Follow-up Variable ($/unit/yr)	Participant Costs, Year Denominated	Participant Costs, Initial ($)	Participant Costs, Years of On-going (yrs)	Participant Costs, On-going ($/Yr)	Participant Savings, Sewer (gpy)	Participant Savings, Gas (Therms/Gal)	Participant Savings, Electricity (KWh/Gal)	Plumbing Code, Year Effective	Plumbing Code, Unit Savings (gpy)	Plumbing Code, Natural Replacement Rate NRR (%)
1	High Efficiency Clothes Washer Rebate - Residentia	Single Family	4,276	0%	0%	15	0%	2019		$195.00				2019	$626.00			5,000.00	0.0035	0.0036	2011	3500	7.14%
2	Water Use Surveys/Audits - SFR	Single Family	12,373	20%	68%	5	0%	2019		$210.60				2019	$50.00			4,949.20	0.0010	0.0000	0	0	0.00%
3	Landscape Conversion or Turf Removal -SFR	Single Family	12	0%	80%	10	0%	2019		$1.30				2019	$1.00			0.00	0.0000	0.0000	0	0	0.00%
4	Smart Irrigation Controller (Weather-Based Irrigation	Single Family	17,258	0%	70%	10	0%	2019		$247.84				2019	$172.39			0.00	0.0000	0.0000	0	0	0.00%
5	Water Use Surveys/Audits - CII	CII	93,521	20%		5	0%	2019		$2,000.00				2019	$2,500.00								
6	Incentivize Irrigation Equipment Upgrades - Large La	Irrigation	36,108	0%		10	0%	2019		$1,300.00				2019	$500.00								
7	Smart Irrigation Controller (Weather-Based Irrigation	Irrigation	96,645	0%	70%	10	0%	2019		$1,094.21				2019	$568.54			0.00	0.0000	0.0000	0	0	0.00%
8	Water Use Surveys/Audits - MFR	Multi Family	93,521	20%		5	0%	2019		$2,000.00				2019	$2,500.00								
9	High Efficiency Faucet Aerator / Showerhead Giveav	Single Family	4,013	0%		5		2019		$31.20				2019	$50.00								
10	Incentivize Irrigation Equipment Upgrades - SFR	Single Family	5,639	0%		10		2019		$325.00				2019	$250.00								
11	Landscape Conversion or Turf Removal - MFR and C	CII	12	0%		10		2019		$1.30				2019	$1.00								
12	Soil Moisture Sensor Rebate	Single Family	13,964	0%		20		2019		$260.00				2019	$300.00								
13	Water Savings Incentive Program for CII	CII	5,995,666	0%		15		2019		$4,676.62				2019	$5,396.10								
14	Restaurant Spray Nozzle Rebates	CII	43,830	0%		5	0%	2019		$65.00				2020	$50.00			43,830.00	0.0083				
15																							
16																							

AWE CONSERVATION TRACKING

Enter annual conservation activity: Use this worksheet to enter the annual activity levels for the conservation activities you defined on the 4. Define Activities worksheet. You can enter activity through the end of your forecast period, but this is not required. It is okay to enter activity for shorter periods. You also can start an activity in

Enter Annual Conservation Activity

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	303	303	303	303	303																				
2	Single Family	Water Use Surveys/Audits - SFR	731	731	731	731	731																				
3	Single Family	Landscape Conversion or Turf Removal -SFR	27856	27856	27856	27856	27856																				
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	37	37	37	37	37																				
5	CII	Water Use Surveys/Audits - CII	43	43	43	43	43																				
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	21	21	21	21	21																				
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	6	6	6	6	6																				
8	Multi Family	Water Use Surveys/Audits - MFR	43	43	43	43	43																				
9	Single Family	High Efficiency Faucet Aerator / Showerhead	909	909	909	909	909																				
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	37	37	37	37	37																				
11	CII	Landscape Conversion or Turf Removal - MF	83568	83568	83568	83568	83568																				
12	Single Family	Soil Moisture Sensor Rebate	37	37	37	37	37																				
13	CII	Water Savings Incentive Program for CII	1	1	1	1	1																				
14	CII	Restaurant Spray Nozzle Rebates	50	50	50	50	50																				

Annual Program Overhead Cost (2019 dollars)	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Enter additional program cost not included in activity definitions																									

Model calculation tables below this line. Do not delete or modify.

Effective Conservation Activity

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	303	606	909	1,212	1,515	1,515	1,515	1,515	1,515	1,515	1,515	1,515	1,515	1,515	1,515	1,212	909	606	303	0	0	0	0	0	0
2	Single Family	Water Use Surveys/Audits - SFR	731	1,316	1,784	2,158	2,457	1,726	1,142	674	299	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Single Family	Landscape Conversion or Turf Removal -SFR	27,856	55,712	83,568	111,424	139,280	139,280	139,280	139,280	139,280	139,280	111,424	83,568	55,712	27,856	0	0	0	0	0	0	0	0	0	0	0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	37	74	111	148	185	185	185	185	185	185	148	111	74	37	0	0	0	0	0	0	0	0	0	0	0
5	CII	Water Use Surveys/Audits - CII	43	77	105	127	145	102	67	40	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	21	42	63	84	105	105	105	105	105	105	84	63	42	21	0	0	0	0	0	0	0	0	0	0	0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	6	12	18	24	30	30	30	30	30	30	24	18	12	6	0	0	0	0	0	0	0	0	0	0	0
8	Multi Family	Water Use Surveys/Audits - MFR	43	77	105	127	145	102	67	40	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	909	1,818	2,727	3,636	4,545	3,636	2,727	1,818	909	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	37	74	111	148	185	185	185	185	185	185	148	111	74	37	0	0	0	0	0	0	0	0	0	0	0
11	CII	Landscape Conversion or Turf Removal - MF	83,568	167,136	250,704	334,272	417,840	417,840	417,840	417,840	417,840	417,840	334,272	250,704	167,136	83,568	0	0	0	0	0	0	0	0	0	0	0
12	Single Family	Soil Moisture Sensor Rebate	37	74	111	148	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	185	148	111	74	37	0
13	CII	Water Savings Incentive Program for CII	1	2	3	4	5	5	5	5	5	5	5	5	5	5	5	4	3	2	1	0	0	0	0	0	0
14	CII	Restaurant Spray Nozzle Rebates	50	100	150	200	250	200	150	100	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Gross Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	4.0	8.0	11.9	15.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	15.9	11.9	8.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	27.8	50.0	67.7	81.9	93.3	65.6	43.3	25.6	11.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	1.0	2.1	3.1	4.1	5.1	5.1	5.1	5.1	5.1	5.1	4.1	3.1	2.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	2.0	3.9	5.9	7.8	9.8	9.8	9.8	9.8	9.8	9.8	7.8	5.9	3.9	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	12.3	22.2	30.1	36.4	41.5	29.1	19.3	11.4	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	2.3	4.7	7.0	9.3	11.6	11.6	11.6	11.6	11.6	11.6	9.3	7.0	4.7	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	1.8	3.6	5.3	7.1	8.9	8.9	8.9	8.9	8.9	8.9	7.1	5.3	3.6	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	12.3	22.2	30.1	36.4	41.5	29.1	19.3	11.4	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	11.2	22.4	33.6	44.8	56.0	44.8	33.6	22.4	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.6	1.3	1.9	2.6	3.2	3.2	3.2	3.2	3.2	3.2	2.6	1.9	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	3.1	6.2	9.2	12.3	15.4	15.4	15.4	15.4	15.4	15.4	12.3	9.2	6.2	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	1.6	3.2	4.8	6.3	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	6.3	4.8	3.2	1.6	0.0
13	CII	Water Savings Incentive Program for CII	18.4	36.8	55.2	73.6	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	73.6	55.2	36.8	18.4	0.0	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	6.7	13.5	20.2	26.9	33.6	26.9	20.2	13.5	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Gross Water Savings		**105.1**	**199.8**	**286.0**	**365.6**	**439.7**	**369.4**	**309.5**	**258.0**	**213.3**	**173.9**	**163.0**	**152.2**	**141.4**	**130.6**	**119.8**	**97.4**	**75.1**	**52.7**	**30.3**	**7.9**	**6.3**	**4.8**	**3.2**	**1.6**	**0.0**

Peak Gross Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	18.9	34.0	46.1	55.7	63.4	44.6	29.5	17.4	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	0.8	1.6	2.5	3.3	4.1	4.1	4.1	4.1	4.1	4.1	3.3	2.5	1.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

4	Single Family	Smart Irrigation Controller (Weather-Based Ir	1.4	2.7	4.1	5.5	6.9	6.9	6.9	6.9	6.9	6.9	5.5	4.1	2.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	1.2	2.5	3.7	5.0	6.2	6.2	6.2	6.2	6.2	6.2	5.0	3.7	2.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	CII	Water Savings Incentive Program for CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Gross Water Savings		**22.3**	**40.9**	**56.4**	**69.5**	**80.6**	**61.8**	**46.7**	**34.6**	**24.9**	**17.2**	**13.8**	**10.3**	**6.9**	**3.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Off Peak Gross Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	4.0	8.0	11.9	15.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	15.9	11.9	8.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	8.9	16.0	21.7	26.2	29.9	21.0	13.9	8.2	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	0.2	0.4	0.6	0.8	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.6	1.2	1.8	2.4	2.9	2.9	2.9	2.9	2.9	2.9	2.4	1.8	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	12.3	22.2	30.1	36.4	41.5	29.1	19.3	11.4	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	2.3	4.7	7.0	9.3	11.6	11.6	11.6	11.6	11.6	11.6	9.3	7.0	4.7	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	0.5	1.1	1.6	2.1	2.7	2.7	2.7	2.7	2.7	2.7	2.1	1.6	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	12.3	22.2	30.1	36.4	41.5	29.1	19.3	11.4	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	11.2	22.4	33.6	44.8	56.0	44.8	33.6	22.4	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.6	1.3	1.9	2.6	3.2	3.2	3.2	3.2	3.2	3.2	2.6	1.9	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	3.1	6.2	9.2	12.3	15.4	15.4	15.4	15.4	15.4	15.4	12.3	9.2	6.2	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	1.6	3.2	4.8	6.3	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	6.3	4.8	3.2	1.6	0.0
13	CII	Water Savings Incentive Program for CII	18.4	36.8	55.2	73.6	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	73.6	55.2	36.8	18.4	0.0	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	6.7	13.5	20.2	26.9	33.6	26.9	20.2	13.5	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Gross Water Savings		**82.8**	**158.9**	**229.7**	**296.1**	**359.1**	**307.6**	**262.8**	**223.4**	**188.3**	**156.7**	**149.3**	**141.9**	**134.6**	**127.2**	**119.8**	**97.4**	**75.1**	**52.7**	**30.3**	**7.9**	**6.3**	**4.8**	**3.2**	**1.6**	**0.0**

Active Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	4.0	7.7	11.2	14.6	17.7	16.7	15.8	14.9	14.1	13.3	12.7	12.0	11.4	10.8	10.3	8.1	5.9	3.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	27.8	50.0	67.7	81.9	93.3	65.6	43.3	25.6	11.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	1.0	2.1	3.1	4.1	5.1	5.1	5.1	5.1	5.1	5.1	4.1	3.1	2.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	2.0	3.9	5.9	7.8	9.8	9.8	9.8	9.8	9.8	9.8	7.8	5.9	3.9	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	12.3	22.2	30.1	36.4	41.5	29.1	19.3	11.4	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	2.3	4.7	7.0	9.3	11.6	11.6	11.6	11.6	11.6	11.6	9.3	7.0	4.7	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	1.8	3.6	5.3	7.1	8.9	8.9	8.9	8.9	8.9	8.9	7.1	5.3	3.6	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	12.3	22.2	30.1	36.4	41.5	29.1	19.3	11.4	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	11.2	22.4	33.6	44.8	56.0	44.8	33.6	22.4	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.6	1.3	1.9	2.6	3.2	3.2	3.2	3.2	3.2	3.2	2.6	1.9	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	3.1	6.2	9.2	12.3	15.4	15.4	15.4	15.4	15.4	15.4	12.3	9.2	6.2	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	1.6	3.2	4.8	6.3	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	6.3	4.8	3.2	1.6	0.0
13	CII	Water Savings Incentive Program for CII	18.4	36.8	55.2	73.6	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	73.6	55.2	36.8	18.4	0.0	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	6.7	13.5	20.2	26.9	33.6	26.9	20.2	13.5	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Active Water Savings		**105.1**	**199.5**	**285.3**	**364.2**	**437.6**	**366.2**	**305.4**	**253.0**	**207.5**	**167.3**	**155.8**	**144.4**	**133.0**	**121.6**	**110.3**	**89.6**	**69.0**	**48.6**	**28.2**	**7.9**	**6.3**	**4.8**	**3.2**	**1.6**	**0.0**

Peak Active Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	18.9	34.0	46.1	55.7	63.4	44.6	29.5	17.4	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	0.8	1.6	2.5	3.3	4.1	4.1	4.1	4.1	4.1	4.1	3.3	2.5	1.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	1.4	2.7	4.1	5.5	6.9	6.9	6.9	6.9	6.9	6.9	5.5	4.1	2.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	1.2	2.5	3.7	5.0	6.2	6.2	6.2	6.2	6.2	6.2	5.0	3.7	2.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	CII	Water Savings Incentive Program for CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Active Water Savings		**22.3**	**40.9**	**56.4**	**69.5**	**80.6**	**61.8**	**46.7**	**34.6**	**24.9**	**17.2**	**13.8**	**10.3**	**6.9**	**3.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Off Peak Active Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	4.0	7.7	11.2	14.6	17.7	16.7	15.8	14.9	14.1	13.3	12.7	12.0	11.4	10.8	10.3	8.1	5.9	3.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	8.9	16.0	21.7	26.2	29.9	21.0	13.9	8.2	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	0.2	0.4	0.6	0.8	1.0	1.0	1.0	1.0	1.0	1.0	0.8	0.6	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.6	1.2	1.8	2.4	2.9	2.9	2.9	2.9	2.9	2.9	2.4	1.8	1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	12.3	22.2	30.1	36.4	41.5	29.1	19.3	11.4	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	2.3	4.7	7.0	9.3	11.6	11.6	11.6	11.6	11.6	11.6	9.3	7.0	4.7	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	0.5	1.1	1.6	2.1	2.7	2.7	2.7	2.7	2.7	2.7	2.1	1.6	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	12.3	22.2	30.1	36.4	41.5	29.1	19.3	11.4	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	11.2	22.4	33.6	44.8	56.0	44.8	33.6	22.4	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.6	1.3	1.9	2.6	3.2	3.2	3.2	3.2	3.2	3.2	2.6	1.9	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	3.1	6.2	9.2	12.3	15.4	15.4	15.4	15.4	15.4	15.4	12.3	9.2	6.2	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	1.6	3.2	4.8	6.3	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	6.3	4.8	3.2	1.6	0.0
13	CII	Water Savings Incentive Program for CII	18.4	36.8	55.2	73.6	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	73.6	55.2	36.8	18.4	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	6.7	13.5	20.2	26.9	33.6	26.9	20.2	13.5	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Active Water Savings		**82.8**	**158.7**	**229.0**	**294.8**	**356.9**	**304.4**	**258.7**	**218.5**	**182.6**	**150.1**	**142.1**	**134.0**	**126.1**	**118.1**	**110.3**	**89.6**	**69.0**	**48.6**	**28.2**	**7.9**	**6.3**	**4.8**	**3.2**	**1.6**	**0.0**

Passive Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	0.0	0.2	0.7	1.3	2.2	3.2	4.1	5.0	5.8	6.5	7.2	7.9	8.5	9.0	9.5	7.8	6.0	4.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	CII	Water Savings Incentive Program for CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Passive Water Savings		**0.0**	**0.2**	**0.7**	**1.3**	**2.2**	**3.2**	**4.1**	**5.0**	**5.8**	**6.5**	**7.2**	**7.9**	**8.5**	**9.0**	**9.5**	**7.8**	**6.0**	**4.1**	**2.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Peak Passive Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	CII	Water Savings Incentive Program for CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Passive Water Savings		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Off Peak Passive Water Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	0.0	0.2	0.7	1.3	2.2	3.2	4.1	5.0	5.8	6.5	7.2	7.9	8.5	9.0	9.5	7.8	6.0	4.1	2.1	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	CII	Water Savings Incentive Program for CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Passive Water Savings		**0.0**	**0.2**	**0.7**	**1.3**	**2.2**	**3.2**	**4.1**	**5.0**	**5.8**	**6.5**	**7.2**	**7.9**	**8.5**	**9.0**	**9.5**	**7.8**	**6.0**	**4.1**	**2.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Customer Water Bill Savings (2019 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	$14,959	$29,331	$43,158	$56,479	$69,331	$66,034	$62,953	$60,074	$57,384	$54,872	$52,527	$50,339	$48,297	$46,393	$44,619	$35,149	$25,975	$17,073	$8,422	$0	$0	$0	$0	$0	$0
2	Single Family	Water Use Surveys/Audits - SFR	$104,427	$189,830	$259,873	$317,516	$365,152	$259,067	$173,003	$103,111	$46,281	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Landscape Conversion or Turf Removal -SFR	$3,859	$7,795	$11,809	$15,901	$20,073	$20,271	$20,472	$20,675	$20,879	$21,086	$17,036	$12,903	$8,687	$4,387	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	$7,372	$14,891	$22,558	$30,375	$38,344	$38,724	$39,107	$39,494	$39,885	$40,280	$32,543	$24,649	$16,595	$8,380	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	CII	Water Use Surveys/Audits - CII	$51,573	$93,751	$128,343	$156,812	$180,337	$127,945	$85,441	$50,923	$22,857	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	$10,791	$21,796	$33,018	$44,460	$56,125	$56,681	$57,242	$57,809	$58,381	$58,959	$47,634	$36,079	$24,291	$12,266	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	$8,252	$16,668	$25,250	$34,000	$42,921	$43,346	$43,775	$44,208	$44,646	$45,088	$36,427	$27,591	$18,576	$9,380	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Multi Family	Water Use Surveys/Audits - MFR	$33,254	$60,450	$82,754	$101,110	$116,280	$82,498	$55,091	$32,835	$14,738	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	$42,116	$85,067	$128,863	$173,518	$219,045	$176,971	$134,042	$90,246	$45,570	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	$2,409	$4,865	$7,370	$9,924	$12,528	$12,652	$12,777	$12,904	$13,031	$13,160	$10,633	$8,053	$5,422	$2,738	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	CII	Landscape Conversion or Turf Removal - MF	$12,861	$25,976	$39,350	$52,986	$66,889	$67,551	$68,220	$68,895	$69,577	$70,266	$56,769	$42,998	$28,949	$14,618	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Soil Moisture Sensor Rebate	$5,965	$12,048	$18,252	$24,576	$31,025	$31,332	$31,642	$31,955	$32,271	$32,591	$32,914	$33,239	$33,569	$33,901	$34,236	$34,575	$34,918	$35,263	$35,613	$35,965	$29,057	$22,008	$14,818	$7,482	$0
13	CII	Water Savings Incentive Program for CII	$76,893	$155,308	$235,269	$316,797	$399,916	$403,876	$407,874	$411,912	$415,990	$420,108	$424,267	$428,468	$432,709	$436,993	$441,319	$356,551	$270,060	$181,823	$91,811	$0	$0	$0	$0	$0	$0	$0
14	CII	Restaurant Spray Nozzle Rebates	$28,105	$56,767	$85,994	$115,794	$146,175	$118,098	$89,450	$60,224	$30,410	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Wastewater Savings		**$402,839**	**$774,545**	**$1,121,860**	**$1,450,248**	**$1,764,141**	**$1,505,045**	**$1,281,090**	**$1,085,265**	**$911,901**	**$756,411**	**$710,750**	**$664,320**	**$617,096**	**$569,055**	**$520,175**	**$426,275**	**$330,953**	**$234,159**	**$135,846**	**$35,965**	**$29,057**	**$22,008**	**$14,818**	**$7,482**	**$0**

Wastewater Savings (AF)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	4.6	9.0	13.2	17.0	20.7	19.5	18.4	17.4	16.5	15.6	14.8	14.0	13.3	12.7	12.1	9.4	6.9	4.5	2.2	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	11.1	20.0	27.1	32.8	37.3	26.2	17.3	10.2	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	CII	Water Savings Incentive Program for CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	6.7	13.5	20.2	26.9	33.6	26.9	20.2	13.5	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Wastewater Savings		**22.5**	**42.5**	**60.4**	**76.7**	**91.7**	**72.7**	**56.0**	**41.1**	**27.8**	**15.6**	**14.8**	**14.0**	**13.3**	**12.7**	**12.1**	**9.4**	**6.9**	**4.5**	**2.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Customer Sewer Bill Savings (2019 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	CII	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Multi Family	Water Use Surveys/Audits - MFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	CII	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Soil Moisture Sensor Rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	CII	Water Savings Incentive Program for CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	CII	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Wastewater Savings		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Customer Electricity Savings (KWh)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	4,664.3	9,055.8	13,194.2	17,097.4	20,782.2	19,600.1	18,502.4	17,483.1	16,536.6	15,657.7	14,841.6	14,083.8	13,380.1	12,726.7	12,120.0	9,454.0	6,917.9	4,502.5	2,199.2	0.0	0.0	0.0	0.0	0.0	0.0
2	Single Family	Water Use Surveys/Audits - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Single Family	Landscape Conversion or Turf Removal -SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	CII	Water Use Surveys/Audits - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Multi Family	Water Use Surveys/Audits - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	CII	Landscape Conversion or Turf Removal - MF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	Single Family	Soil Moisture Sensor Rebate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	CII	Water Savings Incentive Program for CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	CII	Restaurant Spray Nozzle Rebates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Electricity Savings		**4,664.3**	**9,055.8**	**13,194.2**	**17,097.4**	**20,782.2**	**19,600.1**	**18,502.4**	**17,483.1**	**16,536.6**	**15,657.7**	**14,841.6**	**14,083.8**	**13,380.1**	**12,726.7**	**12,120.0**	**9,454.0**	**6,917.9**	**4,502.5**	**2,199.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Customer Electricity Bill Savings (2019 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	$1,298	$2,519	$3,670	$4,756	$5,781	$5,452	$5,147	$4,863	$4,600	$4,356	$4,129	$3,918	$3,722	$3,540	$3,372	$2,630	$1,924	$1,253	$612	$0	$0	$0	$0	$0	$0
2	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	CII	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Multi Family	Water Use Surveys/Audits - MFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

9	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	CII	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Soil Moisture Sensor Rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	CII	Water Savings Incentive Program for CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	CII	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Electricity Savings		**$1,298**	**$2,519**	**$3,670**	**$4,756**	**$5,781**	**$5,452**	**$5,147**	**$4,863**	**$4,600**	**$4,356**	**$4,129**	**$3,918**	**$3,722**	**$3,540**	**$3,372**	**$2,630**	**$1,924**	**$1,253**	**$612**	**$0**	**$0**	**$0**	**$0**	**$0**

Customer Gas Savings (Therms)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	4,535	8,804	12,828	16,622	20,205	19,056	17,988	16,997	16,077	15,223	14,429	13,693	13,008	12,373	11,783	9,191	6,726	4,377	2,138	0	0	0	0	0	0
2	Single Family	Water Use Surveys/Audits - SFR	8,661	15,590	21,133	25,568	29,115	20,454	13,525	7,982	3,548	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Single Family	Landscape Conversion or Turf Removal -SFR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	CII	Water Use Surveys/Audits - CII	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Multi Family	Water Use Surveys/Audits - MFR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	CII	Landscape Conversion or Turf Removal - MF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Single Family	Soil Moisture Sensor Rebate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	CII	Water Savings Incentive Program for CII	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	CII	Restaurant Spray Nozzle Rebates	18,263	36,525	54,788	73,050	91,313	73,050	54,788	36,525	18,263	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Gas Savings		**31,458**	**60,919**	**88,748**	**115,240**	**140,633**	**112,560**	**86,301**	**61,505**	**37,887**	**15,223**	**14,429**	**13,693**	**13,008**	**12,373**	**11,783**	**9,191**	**6,726**	**4,377**	**2,138**	**0**	**0**	**0**	**0**	**0**	**0**

Customer Gas Savings (2019 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	$9,079	$17,627	$25,682	$33,279	$40,452	$38,151	$36,014	$34,030	$32,188	$30,477	$28,889	$27,414	$26,044	$24,772	$23,591	$18,402	$13,465	$8,764	$4,281	$0	$0	$0	$0	$0	$0
2	Single Family	Water Use Surveys/Audits - SFR	$17,340	$31,212	$42,310	$51,188	$58,291	$40,951	$27,079	$15,981	$7,103	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	CII	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Multi Family	Water Use Surveys/Audits - MFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	CII	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Soil Moisture Sensor Rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	CII	Water Savings Incentive Program for CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	CII	Restaurant Spray Nozzle Rebates	$14,683	$29,365	$44,048	$58,730	$73,413	$58,730	$44,048	$29,365	$14,683	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Gas Savings		**$41,102**	**$78,204**	**$112,040**	**$143,198**	**$172,155**	**$137,832**	**$107,140**	**$79,376**	**$53,973**	**$30,477**	**$28,889**	**$27,414**	**$26,044**	**$24,772**	**$23,591**	**$18,402**	**$13,465**	**$8,764**	**$4,281**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

User Entered Utility Avoided Water System Cost (2019 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	CII	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Multi Family	Water Use Surveys/Audits - MFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	CII	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Soil Moisture Sensor Rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	CII	Water Savings Incentive Program for CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	CII	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

User Entered Utility Avoided Wastewater System Cost (2019 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	CII	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Multi Family	Water Use Surveys/Audits - MFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

11	CII	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Soil Moisture Sensor Rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	CII	Water Savings Incentive Program for CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	CII	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

User Entered Other Utility Avoided Cost (2019 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	CII	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Multi Family	Water Use Surveys/Audits - MFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	CII	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Soil Moisture Sensor Rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	CII	Water Savings Incentive Program for CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	CII	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Model Calculator Utility Water System Avoided Cost (2019 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	$6,330	$12,508	$18,541	$24,436	$30,202	$28,997	$27,858	$26,781	$25,764	$24,805	$23,936	$23,116	$22,343	$21,615	$20,931	$16,621	$12,378	$8,196	$4,072	$0	$0	$0	$0	$0	$0
2	Single Family	Water Use Surveys/Audits - SFR	$44,190	$80,950	$111,641	$137,377	$159,068	$113,763	$76,557	$45,967	$20,779	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Landscape Conversion or Turf Removal -SFR	$1,633	$3,324	$5,073	$6,880	$8,744	$8,902	$9,059	$9,217	$9,374	$9,532	$7,763	$5,925	$4,019	$2,044	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	$3,120	$6,350	$9,691	$13,142	$16,703	$17,004	$17,306	$17,607	$17,908	$18,209	$14,829	$11,319	$7,677	$3,904	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	CII	Water Use Surveys/Audits - CII	$19,648	$35,992	$49,638	$61,080	$70,724	$50,581	$34,038	$20,438	$9,239	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	$3,705	$7,541	$11,508	$15,606	$19,835	$20,193	$20,550	$20,908	$21,265	$21,622	$17,610	$13,441	$9,117	$4,636	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	$2,833	$5,767	$8,800	$11,934	$15,169	$15,442	$15,715	$15,989	$16,262	$16,535	$13,467	$10,279	$6,972	$3,545	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Multi Family	Water Use Surveys/Audits - MFR	$19,648	$35,992	$49,638	$61,080	$70,724	$50,581	$34,038	$20,438	$9,239	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	$17,822	$36,275	$55,360	$75,075	$95,421	$77,712	$59,316	$40,232	$20,460	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	$1,019	$2,075	$3,166	$4,294	$5,457	$5,556	$5,654	$5,752	$5,851	$5,949	$4,845	$3,698	$2,508	$1,276	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	CII	Landscape Conversion or Turf Removal - MF	$4,900	$9,973	$15,219	$20,639	$26,232	$26,705	$27,178	$27,650	$28,123	$28,596	$23,289	$17,776	$12,057	$6,131	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Soil Moisture Sensor Rebate	$2,524	$5,138	$7,841	$10,633	$13,515	$13,759	$14,002	$14,246	$14,489	$14,733	$14,998	$15,264	$15,529	$15,795	$16,060	$16,350	$16,639	$16,929	$17,218	$17,507	$14,258	$10,883	$7,382	$3,754	$0
13	CII	Water Savings Incentive Program for CII	$29,293	$59,624	$90,992	$123,396	$156,838	$159,665	$162,491	$165,318	$168,144	$170,970	$174,052	$177,133	$180,214	$183,295	$186,376	$151,788	$115,856	$78,581	$39,962	$0	$0	$0	$0	$0	$0
14	CII	Restaurant Spray Nozzle Rebates	$10,707	$21,793	$33,259	$45,103	$57,327	$46,688	$35,636	$24,170	$12,292	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$167,372**	**$323,301**	**$470,364**	**$610,674**	**$745,960**	**$635,546**	**$539,399**	**$454,711**	**$379,189**	**$310,952**	**$294,789**	**$277,951**	**$260,436**	**$242,242**	**$223,367**	**$184,758**	**$144,873**	**$103,706**	**$61,252**	**$17,507**	**$14,258**	**$10,883**	**$7,382**	**$3,754**	**$0**

Model Calculator Utility Wastewater System Avoided Cost (2019 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Single Family	Water Use Surveys/Audits - SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Landscape Conversion or Turf Removal -SFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	CII	Water Use Surveys/Audits - CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Multi Family	Water Use Surveys/Audits - MFR	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	CII	Landscape Conversion or Turf Removal - MF	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Soil Moisture Sensor Rebate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13	CII	Water Savings Incentive Program for CII	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	CII	Restaurant Spray Nozzle Rebates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Total Avoided Water and Wastewater Production Cost (2019 dollars)

Activity ID	Class	Activity Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	Single Family	High Efficiency Clothes Washer Rebate - Res	$6,330	$12,508	$18,541	$24,436	$30,202	$28,997	$27,858	$26,781	$25,764	$24,805	$23,936	$23,116	$22,343	$21,615	$20,931	$16,621	$12,378	$8,196	$4,072	$0	$0	$0	$0	$0	$0
2	Single Family	Water Use Surveys/Audits - SFR	$44,190	$80,950	$111,641	$137,377	$159,068	$113,763	$76,557	$45,967	$20,779	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
3	Single Family	Landscape Conversion or Turf Removal -SFR	$1,633	$3,324	$5,073	$6,880	$8,744	$8,902	$9,059	$9,217	$9,374	$9,532	$7,763	$5,925	$4,019	$2,044	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
4	Single Family	Smart Irrigation Controller (Weather-Based Ir	$3,120	$6,350	$9,691	$13,142	$16,703	$17,004	$17,306	$17,607	$17,908	$18,209	$14,829	$11,319	$7,677	$3,904	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	CII	Water Use Surveys/Audits - CII	$19,648	$35,992	$49,638	$61,080	$70,724	$50,581	$34,038	$20,438	$9,239	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
6	Irrigation	Incentivize Irrigation Equipment Upgrades - L	$3,705	$7,541	$11,508	$15,606	$19,835	$20,193	$20,550	$20,908	$21,265	$21,622	$17,610	$13,441	$9,117	$4,636	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
7	Irrigation	Smart Irrigation Controller (Weather-Based Ir	$2,833	$5,767	$8,800	$11,934	$15,169	$15,442	$15,715	$15,989	$16,262	$16,535	$13,467	$10,279	$6,972	$3,545	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
8	Multi Family	Water Use Surveys/Audits - MFR	$19,648	$35,992	$49,638	$61,080	$70,724	$50,581	$34,038	$20,438	$9,239	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
9	Single Family	High Efficiency Faucet Aerator / Showerhead	$17,822	$36,275	$55,360	$75,075	$95,421	$77,712	$59,316	$40,232	$20,460	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
10	Single Family	Incentivize Irrigation Equipment Upgrades - S	$1,019	$2,075	$3,166	$4,294	$5,457	$5,556	$5,654	$5,752	$5,851	$5,949	$4,845	$3,698	$2,508	$1,276	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	CII	Landscape Conversion or Turf Removal - MF	$4,900	$9,973	$15,219	$20,639	$26,232	$26,705	$27,178	$27,650	$28,123	$28,596	$23,289	$17,776	$12,057	$6,131	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Single Family	Soil Moisture Sensor Rebate	$2,524	$5,138	$7,841	$10,633	$13,515	$13,759	$14,002	$14,246	$14,489	$14,733	$14,998	$15,264	$15,529	$15,795	$16,060	$16,350	$16,639	$16,929	$17,218	$17,507	$14,258	$10,883	$7,382	$3,754	$0

13	CII	Water Savings Incentive Program for CII	$29,293	$59,624	$90,992	$123,396	$156,838	$159,665	$162,491	$165,318	$168,144	$170,970	$174,052	$177,133	$180,214	$183,295	$186,376	$151,788	$115,856	$78,581	$39,962	$0	$0	$0	$0	$0	$0
14	CII	Restaurant Spray Nozzle Rebates	$10,707	$21,793	$33,259	$45,103	$57,327	$46,688	$35,636	$24,170	$12,292	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Total Avoided Cost		**$167,372**	**$323,301**	**$470,364**	**$610,674**	**$745,960**	**$635,546**	**$539,399**	**$454,711**	**$379,189**	**$310,952**	**$294,789**	**$277,951**	**$260,436**	**$242,242**	**$223,367**	**$184,758**	**$144,873**	**$103,706**	**$61,252**	**$17,507**	**$14,258**	**$10,883**	**$7,382**	**$3,754**	**$0**

Appendix C

Methodology for Water Conservation Program Savings Analyses

Appendix C
Methodology for Water Conservation Program Savings Analyses

This Appendix describes the methodology used to estimate water conservation program savings based on customer billing data, for the analyses presented in report Section 5.3.2, *Estimated Water Savings for Selected Programs Based on Customer Billing Data*.

Water use savings associated with conservation programs are typically estimated based on literature values, which may or may not accurately capture the specific ways customers in a specific area (i.e., Marin Municipal Water District [District]) use water. Therefore, District customer billing data were analyzed in order to assess the amount of water typically saved through implementation of each of the four selected conservation programs. Water use by program participants was compared to water use by a representative cohort over the same time period, that was stratified based on key criteria. Water use savings were estimated for the four conservation programs identified below:[1]

1. Advanced Metering Infrastructure (AMI) Leak Notifications Program
2. Residential High Efficiency Clothes Washer (HECW) Rebate Program
3. SFR Water Use Surveys/Audits Program
4. SFR Weather-Based Irrigation Controller (WBIC) Rebate Program

Specifically, water use before and after implementation of a given action (e.g., device replacement or turf removal) by program participants is compared to the water use by a cohort of accounts who have not participated in the same or other programs in the given time frame. The incremental volume of water saved by program participants compared to that of the cohort group can then be attributed to program participation, as other factors have been normalized. This analytical technique is a version of the "Difference-in-Differences Estimation" method. The Difference-in-Differences Estimation method is a standard method used in economics and social science for quantitatively evaluating observational study data by studying the differential effect of a treatment, or in this case participation in a given program as compared to a "control group," when a true controlled experiment cannot be performed (Columbia Public Health, 2013).

By comparing water use over time by program participants to a cohort group and identifying the incremental change in water use due to program participation, this methodology controls for variations in water use due to climatic, economic, and other temporally related factors. By stratifying (or weighting) the cohort group based on key factors (i.e., Census Block Group or neighborhood), this method also effectively controls for geographic-linked water use influencing factors, such as house and yard size, housing age, general socio-economic factors, general landscape management factors, etc.

Participant Sample Groups: In order to estimate water savings attributable to a single conservation program, participant sample groups for this analysis were limited to accounts that participated in only one program, and who participated in that program in only one year (e.g., did not receive several rebates from the same program over several years), except as indicated in savings results tables, as appropriate. The

[1] This analysis was also performed for the Rain Barrel Rebate Program. However, due to the limited sample size and likely other human factors, the results were not considered robust and thus are not presented herein.

participant sample groups were further limited to just those accounts that had active water use over the study period. Active accounts were identified as those who received six water bills and had non-zero water use in a given year.

Comparison Cohort Sample Groups: Accounts included in the cohort groups are limited to those accounts that had not participated in any program based on available data and that meet the same active account thresholds as described above for the participant sample groups (i.e., received six bills per year and non-zero annual water use). It is possible that members of the cohort group participated in a program that was not included in this study; however, given the large number of accounts included in these cohort groups the effect of participation in other programs would be expected to be minimal. Although not participants in a specific program, a portion of the cohort group members would be expected to have changed out water using devices with more efficient ones through natural replacement. Given this, the program savings identified by this method may actually be somewhat higher than estimated herein, resulting in a more conservative program savings estimate.

Study Periods: Since account-level water use billing data are available from 2004 to 2019, the participation data from 2010 to 2018 are analyzed so that one to three years of water use data can be used to capture the average water use before and after the participation year. The AMI Leak Notifications Program started in 2018, and thus even though there is only one year of billing data (2019) available to represent the average water use after the participation year, participation year 2018 is included.

Stratification: The water savings calculations for SFR accounts were stratified (or weighted) based on the Census Block Group (except as indicated in savings results table notes, as appropriate), as a way to control for geographically linked variables such as house and yard size, housing age, and general socio-economic factors, among others.

Water Savings Calculation: For each active account, the average annual water use for a period of three years prior to program participation is compared to the average annual water use in the year following program participation, dependent on available data. The change in water use by program participants is then compared to that of the cohort group over the same time period. The difference between the change in water use of the participants and the change in water use of the cohorts is the water savings due to the given conservation program. A positive average water savings suggests the program resulted in water savings, while a negative average water savings suggests the program was not successful in saving water.

References

Columbia Public Health, 2013. Difference in Difference Estimation. Columbia Public Health, https://www.publichealth.columbia.edu/research/population-health-methods/difference-difference-estimation#Overview, accessed 28 September 2020.

Appendix D

Prioritization and Screening of Future Water Conservation Measures

Prioritization and Screening of Future Water Conservation Measures
Marin-Sonoma Saving Water Partnership

INSTRUCTIONS: Please review and complete the orange highlighted cells using the provided dropdown lists. Comments and clarifications may be added to the comments column on the right. You may use the filter features to help navigate this list. "Preference for Implementation" need only be completed when a program is given a priorty of 3 or greater. See READ ME tab for additional information.

Conservation Measure/Program	Type	Indoor / Outdoor	Primary End Use	Sector	Priority as a Regional Program	Priority as a Local Program	Preference for Implementation	Current Implementation Status	Notes / Comments	Source	Added By
Agency Actions and Water Rates											
Customer Water Loss Reduction (AMI Leak Detection)	Agency action	Both	Water Loss	All						2015 Screening	EKI
Increase Enforcement of Customer Pressure Reducing Valve (PRV) Requirement	Agency action	Both	Water loss; Irrigation	All						Added 2020	EKI
Increase Enforcement of Indoor Fixture Retrofit at Time of Sale	Agency action	Indoor	Toilet, Urinal, Faucet, Showerhead	All					Enforcement of SB 407 at time of sale.	2015 Screening	EKI
Increase Enforcement of State Water Waste Regulations	Agency action	Outdoor	Irrigation	All					Assumes water waste regulations per Executive Order B-40-17 rulemaking is completed largely as currently proposed.	Added 2020	EKI
Install AMI for Existing Accounts	Agency action	Both	Water Loss	All						2015 Screening	EKI
Install AMI for High Water Users and Large Landscape Accounts	Agency action	Outdoor	Water Loss	All						2015 Screening	EKI
Install AMI in New Development	Agency action	Both	Water Loss	All						2015 Screening	EKI
Rate Structure Evaluation	Agency action	Both	All	All						2015 Screening	EKI
Regional UHET and/or Urinal Bulk Purchase Program	Agency action	Indoor	Toilet / Urinal	All					Fixtures are purchased in bulk at a discounted rate and then sold to customers at the discounted rate	2015 Screening	EKI
Water Budgeting/Monitoring for Large Landscape Accounts	Agency action	Both	Irrigation	IRR						2015 Screening	EKI
Establish Separate Pricing Structure for Irrigation Accounts	Water Rates	Outdoor	Irrigation	IRR						2015 Screening	EKI
Modification to or Implementation of Tiered Rate Conservation Pricing	Water Rates	Both	All	All						2015 Screening	EKI
Tiered Water Rates (Conservation Pricing)	Water Rates	Both	All	All						2015 Screening	EKI
Water Budget Based Billing for All Customers	Water Rates	Both	All	All						2015 Screening	EKI
Water Budget Based Billing for Only Irrigation Customers	Water Rates	Outdoor	Irrigation	CII, IRR						2015 Screening	EKI
Public Outreach and Education											
Water Use Surveys/Audits - CII	Audit/ Survey	Both	All	CII						2015 Screening	EKI
Water Use Surveys/Audits - MFR	Audit/ Survey	Indoor	All Indoor	MFR						2015 Screening	EKI
Water Use Surveys/Audits - SFR	Audit/ Survey	Both	All	SFR						2015 Screening	EKI
Educational Workshops	Public Outreach/ Workshop	Outdoor	All Outdoor	SFR						Added 2020	MMWD
Garden tour	Public Outreach/ Workshop	Outdoor	Outdoor	SFR						Added 2020	MMWD
Promote Green Building and Certification	Public Outreach/ Workshop	Both	All	All						2015 Screening	EKI
Provide Support with Smart Irrigation Controller Setup	Public Outreach/ Workshop	Outdoor	Irrigation	All						Added 2020	EKI
Public Outreach through Print & Electronic Media - Focused on Indoor Conservation	Public Outreach/ Workshop	Outdoor	All Indoor	All						2015 Screening	EKI
Public Outreach through Print & Electronic Media - Focused on Outdoor Irrigation	Public Outreach/ Workshop	Indoor	Irrigation	All						2015 Screening	EKI
QWEL Training (Qualified Water Efficient Landscaper)	Public Outreach/ Workshop	Outdoor	Irrigation	All						Added 2020	EKI
School Education Programs	Public Outreach/ Workshop	Both	All	SFR, MFR						2015 Screening	EKI
Device-Based and Financial Incentive Programs											
Direct Install of Efficient Indoor Fixtures - Commercial and Industrial	Direct Install/ No-Cost Device	Indoor	Toilet, Urinal, Faucet, Showerhead	CII						2015 Screening	EKI
Direct Install of Efficient Indoor Fixtures - Government Buildings	Direct Install/ No-Cost Device	Indoor	Toilet, Urinal, Faucet, Showerhead	CII						2015 Screening	EKI
Direct Install of Efficient Indoor Fixtures - Low Income Residential	Direct Install/ No-Cost Device	Indoor	Toilet, Faucet, Showerhead	SFR, MFR						2015 Screening	EKI
Direct Install of Efficient Indoor Fixtures - Residential	Direct Install/ No-Cost Device	Indoor	Toilet, Faucet, Showerhead	SFR, MFR						2015 Screening	EKI
High Efficiency Clothes Washer Install - Low Income Residential Customers	Direct Install/ No-Cost Device	Indoor	Clothes Washer	SFR, MFR						Added 2020	EKI
High Efficiency Faucet Aerator / Showerhead Giveaway - CII Customers	Direct Install/ No-Cost Device	Indoor	Faucet, Showerhead	CII						2015 Screening	EKI
High Efficiency Faucet Aerator / Showerhead Giveaway - Residential Customers	Direct Install/ No-Cost Device	Indoor	Faucet, Showerhead	SFR, MFR						2015 Screening	EKI
Rain Barrel Giveaway	Direct Install/ No-Cost Device	Outdoor	Irrigation	SFR						Added 2020	EKI
Rain Sensor Giveaway	Direct Install/ No-Cost Device	Outdoor	Irrigation	All						2015 Screening	EKI
Rotating Sprinkler Nozzle Giveaway	Direct Install/ No-Cost Device	Outdoor	Irrigation	All						Added 2020	EKI
Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - Large Landscape	Direct Install/ No-Cost Device	Outdoor	Irrigation	MFR, CII						2015 Screening	EKI
Smart Irrigation Controller (Weather-Based Irrigation Controller) Giveaway - SFR	Direct Install/ No-Cost Device	Outdoor	Irrigation	SFR						Added 2020	EKI
Soil Moisture Sensor Giveaway	Direct Install/ No-Cost Device	Outdoor	Irrigation	All						Added 2020	EKI
Toilet Flapper Giveaway - SFR customers	Direct Install/ No-Cost Device	Indoor	Toilet	SFR, MFR					Could be used for CII customers, but hasn't been yet.	Added 2020	Santa Rosa
UHET Direct Installation - CII	Direct Install/ No-Cost Device	Indoor	Toilet	CII						2015 Screening	EKI
UHET Direct Installation - Residential	Direct Install/ No-Cost Device	Indoor	Toilet	SFR, MFR						2015 Screening	EKI
Urinal Direct Installation - CII	Direct Install/ No-Cost Device	Indoor	Urinal	CII						Added 2020	EKI
Autoclave (Steam-Sterilizer) Retrofit Rebates	Rebate/ Financial Incentive	Indoor	CII Equipment	CII					More info: https://www.energy.gov/eere/femp/water-efficient-technology-opportunity-steam-sterilizer-condensate-retrofit-kit	Added 2020	EKI
Connectionless Food Steamer Rebates	Rebate/ Financial Incentive	Indoor	CII Equipment	CII					More info: https://www.energy.gov/eere/femp/water-efficient-technology-opportunity-connectionless-food-steamer	Added 2020	EKI
Dipper Well Rebates	Rebate/ Financial Incentive	Indoor	CII Equipment	CII					Incentivize replacement of perpetual-flow holders for ice cream dippers & utensils; https://server-products.com/equipment/conservewell/utensil-holder/87740.htm	Added 2020	EKI
Drip Irrigation Incentive for MFR and CII	Rebate/ Financial Incentive	Outdoor	Irrigation	MFR, CII						2015 Screening	EKI
Drip Irrigation Incentive for SFR	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						2015 Screening	EKI
Dry Vacuum Pumps	Rebate/ Financial Incentive	Indoor	CII Equipment	CII						2015 Screening	EKI
Efficient (EnergyStar) Dishwasher Rebates	Rebate/ Financial Incentive	Indoor	Dishwashers	SFR						2015 Screening	EKI
High Efficiency Clothes Washer Rebate - Residential	Rebate/ Financial Incentive	Indoor	Clothes Washer	SFR, MFR						2015 Screening	EKI
High Efficiency Clothes Washer Rebate Program - CII	Rebate/ Financial Incentive	Indoor	Clothes Washer	CII						2015 Screening	EKI
High Efficiency Urinal (<0.25 gal/flush) Rebates - CII	Rebate/ Financial Incentive	Indoor	Urinal	CII						2015 Screening	EKI

Prioritization and Screening of Future Water Conservation Measures
Marin-Sonoma Saving Water Partnership

INSTRUCTIONS: Please review and complete the orange highlighted cells using the provided dropdown lists. Comments and clarifications may be added to the comments column on the right. You may use the filter features to help navigate this list. "Preference for Implementation" need only be completed when a program is given a priorty of 3 or greater. See READ ME tab for additional information.

Conservation Measure/Program	Type	Indoor / Outdoor	Primary End Use	Sector	Priority as a Regional Program	Priority as a Local Program	Preference for Implementation	Current Implementation Status	Notes / Comments	Source	Added By
Hot Water on Demand Pump System Rebate	Rebate/ Financial Incentive	Indoor	Hot Water	SFR, MFR						2015 Screening	EKI
Incentivize Artificial Turf for Sports Fields	Rebate/ Financial Incentive	Outdoor	Irrigation	CII						2015 Screening	EKI
Incentivize Cooling Tower Upgrades	Rebate/ Financial Incentive	Indoor	Cooling Towers	CII						Added 2020	EKI
Incentivize Gray Water Retrofit for Existing SFR Customers	Rebate/ Financial Incentive	Outdoor	Irrigation / Gray Water	SFR						2015 Screening	EKI
Incentivize Gray Water Systems for New CII Development	Rebate/ Financial Incentive	Both	Irrigation / Gray Water	CII						2015 Screening	EKI
Incentivize Irrigation Equipment Upgrades - Large Landscapes	Rebate/ Financial Incentive	Outdoor	Irrigation	MFR, CII, IRR						2015 Screening	EKI
Incentivize Irrigation Equipment Upgrades - SFR	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						2015 Screening	EKI
Incentivize Replacement of Inefficient Commercial and Industrial Equipment	Rebate/ Financial Incentive	Indoor	CII Equipment	CII					Example: SoCal Water Smart Water Savings Incentive Program: https://socalwatersmart.com/en/commercial/water-savings-incentive-program/	2015 Screening	EKI
Incentivize Replacement of Pressure Reducing Valves (PRVs) with 60-70 psi PRVs	Rebate/ Financial Incentive	Both	Water loss; Irrigation	All					PRVs must be installed by customers with pressure exceeding 80 psi, per the plumbing code	2015 Screening	EKI
Incentivize Submetering for Existing Customers - CII	Rebate/ Financial Incentive	Both	All Indoor	MFR, COM, IRR						2015 Screening	EKI
Incentivize Submetering for Existing Customers - MFR	Rebate/ Financial Incentive	Both	All Indoor	MFR						2015 Screening	EKI
Incentivize Submetering of Cooling Towers for Existing Customers	Rebate/ Financial Incentive	Indoor	Cooling Towers	CII						2015 Screening	EKI
Indoor Fixture Program For Hotels & Motels	Rebate/ Financial Incentive	Indoor	All Indoor	CII						2015 Screening	EKI
Indoor Fixture Program For Schools	Rebate/ Financial Incentive	Indoor	All Indoor	CII						2015 Screening	EKI
Landscape Conversion or Turf Removal - MFR and CII	Rebate/ Financial Incentive	Outdoor	Irrigation	MFR, CII						2015 Screening	EKI
Landscape Conversion or Turf Removal -SFR	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						2015 Screening	EKI
Mulch rebate	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						Added 2020	MMWD
Nonresidential Incentive for Self-closing or Metering Faucets	Rebate/ Financial Incentive	Indoor	Faucet	CII						Added 2020	Sonoma
Plumber Initiated UHET and / or Urinal Retrofit Program	Rebate/ Financial Incentive	Indoor	Toilet	All						2015 Screening	EKI
Rain Barrel Rebate	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						2015 Screening	EKI
Rain Sensor Rebate	Rebate/ Financial Incentive	Outdoor	Irrigation	All						2015 Screening	EKI
Rainwater Catchment System Rebate for Large Landscapes	Rebate/ Financial Incentive	Outdoor	Irrigation	MFR, CII						2015 Screening	EKI
Rebates for Conductivity Controllers on Cooling Towers	Rebate/ Financial Incentive	Indoor	Cooling Towers	CII						2015 Screening	EKI
Restaurant Spray Nozzle Rebates	Rebate/ Financial Incentive	Indoor	CII Equipment	CII						2015 Screening	EKI
Rotating Sprinkler Nozzle Rebate	Rebate/ Financial Incentive	Outdoor	Irrigation	All						2015 Screening	EKI
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - Large Landscape	Rebate/ Financial Incentive	Outdoor	Irrigation	MFR, CII						2015 Screening	EKI
Smart Irrigation Controller (Weather-Based Irrigation Controller) Rebates - SFR	Rebate/ Financial Incentive	Outdoor	Irrigation	SFR						2015 Screening	EKI
Soil Moisture Sensor Rebate	Rebate/ Financial Incentive	Outdoor	Irrigation	All						2015 Screening	EKI
Swimming Pool and Hot Tub Cover Rebates	Rebate/ Financial Incentive	Outdoor	Pool/Hot Tub	SFR, MFR						Added 2020	EKI
Thermostatic Shut-Off Valve Showerheads/Tub Spouts Rebates	Rebate/ Financial Incentive	Indoor	Shower	SFR, MFR, CII					Reduce hot water use before showering https://www.thinkevolve.com/	Added 2020	EKI
Tier 4 Exemption	Rebate/ Financial Incentive	Both	toilet, Faucet, Showerhead, clothes washer, irrigation	SFR					Exemption from high tier water rates w/installation of devices	Added 2020	MMWD
UHET <1.0 gal/flush Rebate - CII	Rebate/ Financial Incentive	Indoor	Toilet	CII						2015 Screening	EKI
UHET <1.0 gal/flush Rebate - Residential	Rebate/ Financial Incentive	Indoor	Toilet	SFR, MFR						2015 Screening	EKI
Water Savings Incentive Program for CII	Rebate/ Financial Incentive	Indoor	All Indoor	CII					Financial incentive to reward demonstrated water savings and offset capital improvement costs; Example: SoCal Water Smart Water Savings Incentive Program: https://socalwatersmart.com/en/commercial/water-savings-incentive-program/	2015 Screening	EKI
Policies and Regulations											
Demand Offset/Water Neutral Policy for Large New Developments	Policy/ Regulation	Both	All	All						Added 2020	EKI
Prohibit Once through Cooling Systems	Policy/ Regulation	Both	CII Equipment	CII						2015 Screening	EKI
Require <0.25 gal/flush Urinals in New Development	Policy/ Regulation	Indoor	Urinal	CII						2015 Screening	EKI
Require <1.0 gal/flush Toilets in New Development	Policy/ Regulation	Indoor	Toilet	All					State minimum efficiency is 1.28 gal/flush	Added 2020	EKI
Require Cooling Tower Retrofits	Policy/ Regulation	Indoor	Cooling Towers	CII						2015 Screening	EKI
Require Efficient (EnergyStar) Dishwashers in New Development	Policy/ Regulation	Indoor	Dishwashers	SFR, MFR						2015 Screening	EKI
Require High Efficiency Clothes Washers in New Development	Policy/ Regulation	Indoor	Clothes Washer	SFR, MFR						2015 Screening	EKI
Require Hot Water on Demand / Structured Plumbing in New Residential Development	Policy/ Regulation	Indoor	Shower/Sink	SFR, MFR						2015 Screening	EKI
Require Irrigation Designers / Installers be Certified (QWEL)	Policy/ Regulation	Outdoor	Irrigation	All						2015 Screening	EKI
Require On-Site Water Reuse Systems (Grey Water or Black Water) for Large CII Developments	Policy/ Regulation	Outdoor	Irrigation / Recycled Water	CII					Example: https://sfwater.org/index.aspx?page=686	Added 2020	EKI
Require Plumbing for Gray Water in New SFR Development	Policy/ Regulation	Outdoor	Irrigation / Gray Water	SFR						2015 Screening	EKI
Require Plumbing for Recycled Water in New CII Development	Policy/ Regulation	Outdoor	Irrigation / Recycled Water	CII						Added 2020	EKI
Require Plumbing for Recycled Water in New MFR Development	Policy/ Regulation	Outdoor	Irrigation / Recycled Water	MFR						Added 2020	EKI
Require Rain Barrels in New Development	Policy/ Regulation	Outdoor	Irrigation	SFR						2015 Screening	EKI
Require Submetering by Unit for Existing Commercial Customers	Policy/ Regulation	Indoor	All Indoor	CII						Added 2020	EKI
Require Submetering by Unit for New Commercial Developments	Policy/ Regulation	Indoor	All Indoor	CII						Added 2020	EKI
Require Submetering for New MFR Developments	Policy/ Regulation	Indoor	All Indoor	MFR						2015 Screening	EKI
Require Submetering for New Mobile Home Park Developments	Policy/ Regulation	Indoor	All Indoor	MFR						2015 Screening	EKI
Require Submetering of Cooling Towers for Existing Customers	Policy/ Regulation	Indoor	Cooling Towers	CII						Added 2020	EKI
Require Submetering of Cooling Towers for New Development	Policy/ Regulation	Indoor	Cooling Towers	CII						Added 2020	EKI
Require Submetering of Existing MFR (and Mobile Home Park) Customers	Policy/ Regulation	Indoor	All Indoor	MFR						Added 2020	EKI
Require Submetering of Landscaping for Existing MFR and Commercial Customers	Policy/ Regulation	Outdoor	Irrigation	MFR, CII						Added 2020	EKI
Require Submetering of Landscaping for New MFR and Commercial Developments	Policy/ Regulation	Outdoor	Irrigation	CII						Added 2020	EKI
Require Swimming Pool and Hot Tub Covers	Policy/ Regulation	Outdoor	Pool/Hot Tub	SFR, MFR						2015 Screening	EKI

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Conservation Measure/Program	Type	Indoor / Outdoor	Primary End Use	Sector	Priority as a Regional Program	Priority as a Local Program	Preference for Implementation	Current Implementation Status	Notes / Comments	Source	Added By
Require Water Efficiency Plan Reviews for New CII Development	Policy/ Regulation	Both	All Indoor	CII						2015 Screening	EKI
Require Weather Adjusting Smart Irrigation Controllers, Rain Sensors, and/or Soil Moisture Sensors in New Development	Policy/ Regulation	Outdoor	Irrigation	All						2015 Screening	EKI
Restrict Landscape Irrigation to Designated Days/Times	Policy/ Regulation	Outdoor	Irrigation	All					Under all conditions, not just drought	2015 Screening	EKI
Water Conserving Landscape and Irrigation Codes, More Stringent than MWELO	Policy/ Regulation	Outdoor	Irrigation	All						2015 Screening	EKI
Water Waste Ordinance	Policy/ Regulation	Outdoor	All Outdoor	All						Added 2020	MMWD

Abbreviations:
AMI = advanced metering infrastructure
CII = commercial, industrial, institutional
COM = commercial
HET = high efficiency toilet
HEU = high efficiency urinal
Info = information
IRR = irrigation account
MFR = multi-family residential
MWELO = Model Water Efficient Landscape Ordinance
PRV = pressure reducing valve
SFR = single-family residential
SMSWP = Sonoma-Marin Saving Water Partnership
UHET = ultra high efficiency toilet

Item Number: 10
Meeting Date: 02-02-2021
Meeting: Board of Directors

Informational Item

TO: Board of Directors

FROM: Terrie Gillen, Board Secretary

THROUGH: Ben Horenstein, General Manager

DEPARTMENT NAME: Communications & Public Affairs Department

ITEM: Future Meeting Schedule and Agenda Items

SUMMARY

Review of the upcoming Board of Directors and Committee meetings.

DISCUSSION

Below are the upcoming meetings of the Board of Directors and/or Committees:

- Tuesday, February 16, 2021
  Regular Bi-Monthly Board of Directors' Meeting
  7:30 p.m.

- Wednesday, February 17, 2021
  Communications & Water Efficiency Committee/Board of Directors (Communications & Water Efficiency) Meeting
  9:30 a.m.

- Friday, February 19, 2021
  Operations Committee/Board of Directors (Operations) Meeting
  9:30 a.m.

- Thursday, February 25, 2021
  Finance & Administration Committee/Board of Directors (Finance & Administration) Meeting
  9:30 a.m.

FISCAL IMPACT

None

ATTACHMENT(S)

None