

MARIN MUNICIPAL WATER DISTRICT



2024

5

YEAR

WATER EFFICIENCY MASTER PLAN



MARIN WATER

2024 **5** YEAR WATER EFFICIENCY MASTER PLAN

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INTRODUCTION

Thank you for taking an interest in water use efficiency in Marin Water. We created this Five-Year Water Efficiency Master Plan to outline the District's strategies for achieving our water use efficiency objectives.

This document offers a comprehensive examination of our customers' current water use patterns, outlines the District's water efficiency targets, and presents our strategies for advancing water conservation within the Marin Water service area.

The collaborative process of developing this Plan has allowed the District to celebrate the progress our community has already achieved while also identifying further opportunities for savings and discussing the strategies necessary to realize them. We extend our gratitude to the community for their valuable insights that have informed the development of this Plan.

Drawing upon this input, the Plan emphasizes key program initiatives, outlines strategies for the next five years, and delineates the District's methodology for evaluating programs and monitoring success over time.

We commend the community for their ongoing efforts to use water wisely and hope this Plan will inspire continued action among stakeholders, customers, and other interested parties. For more information on our current water use efficiency activities, please visit marinwater.org/waterefficiency.

Ben Horenstein

General Manager
Marin Water

HIGHLIGHTS

Water efficiency remains a high priority in Marin. Our investments in water efficiency programs, along with the effort of our customers, have helped to improve our overall resilience and will reduce our need for supplemental water supplies. As a result of our collective efforts, water use per person in Marin Water is lower than 75% of Californians. We are asked, "Can we save more?" The answer is YES! Marin Water is always looking for innovative ways to advance water efficiency and to quantify results of potential opportunities.

Our customers are already using water efficiently.

- Marin Water's per capita water use is lower than 75% of California water suppliers.
- Our total water use decreased by 30% between 2020 and 2022 due to our customers' drought response and our accelerated implementation of water efficiency efforts.
- Indoor water use for our residential customers averaged 46 gallons per capita per day (GPCD) in 2022. By comparison, the State's current standard for efficient indoor residential use is 55 GPCD, and the national average in 2016 was 55 GPCD.

Our water efficiency investments have helped our customers to reduce their use.

Initiatives over the last 5 years include:

- Cash for Grass program to replace lawn with sustainable landscapes.
- Discount program for Rachio irrigation controllers to improve irrigation efficiency.
- Pilot programs to test savings from new technology, such as Advanced Metering Infrastructure (AMI or "smart meters").
- Evaluation of opportunities to reduce water losses from system operations through our water loss control efforts.

Future savings will come from outdoor water use reductions and new innovations.

- Outdoor water use efficiency investments to maintain reductions achieved during the 2021-2022 drought provide the greatest potential for long-term demand reductions.
- Ongoing efforts to develop partnerships that leverage multiple benefits will continue to play a crucial role in our conservation endeavors.
- We will test opportunities to use advanced analytics to customize water-savings programs for residents, businesses, and landscape.

Education will continue to increase awareness of the many benefits of water use efficiency.

- Youth Education will continue to focus on where our water comes from and establishing water-saving habits for our school-aged water customers.
- Our adult education program will continue to include sustainable landscape webinars, professional trainings for landscape contractors, and developing meaningful collaborations with local partners to support water efficiency and sustainability initiatives.



We will continue to monitor the effectiveness of our program and adapt to meet our demand reduction goals.

- Marin Water uses advanced analytical methods to understand how well our water efficiency programs are performing.
- We will continue to track progress towards our water efficiency program participation goals and overall water use reduction targets.

Looking forward

- Our goal is to minimize the inevitable rebound in water use by converting water use reductions achieved in the drought to long-term efficiency.
- Through 2045, our goal is to achieve an additional 4,160 acre-feet per year (AFY) of savings from water efficiency measures.
- We will continue to implement new technology, new programs, and new tools to support water efficiency in our community, including innovative pilot programs.

Marin Water has made great progress in advancing water efficiency in recent years. The next five years will build upon our successes and incorporate exciting new options to maintain a resilient, water-efficient community.



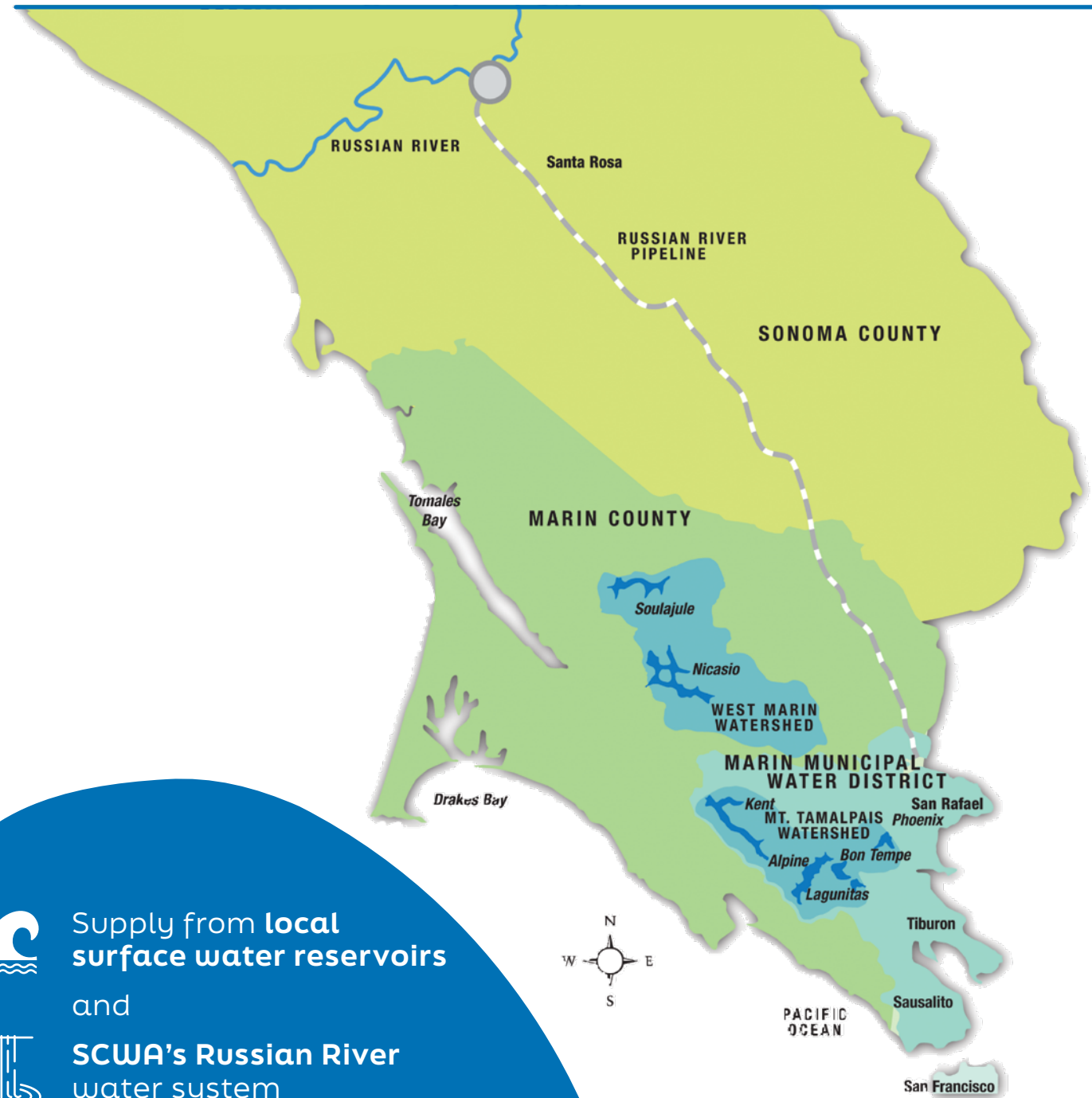
1 HOW WE USE WATER TODAY



The Marin Municipal Water District (Marin Water or District) serves approximately 191,300 customers in central and southern Marin County. The District encompasses the eastern corridor of Marin County, extending from the Golden Gate Bridge up to, but not including, the City of Novato. The incorporated cities and towns in the service area include San Rafael, Mill Valley, Fairfax, San Anselmo, Ross, Larkspur, Corte Madera, Tiburon, Belvedere, and Sausalito. Residents enjoy a Mediterranean coastal climate with mild and dry summers, and cool and wet winters.

Water is 100% locally sourced from seven local surface water reservoirs and from Sonoma County Water Agency's (SCWA) Russian River water system. On average, Marin Water delivers approximately 25,300 acre-feet per year (AFY). Despite slight population growth within the service area, water use in Marin Water service area has declined over the past decade. This water use profile reflects the District's continued commitment to water conservation since the 1970s to manage the challenges of climate, growth, and regulations. While new water supply projects will improve water supply reliability, water use efficiency remains a critical component of long-term planning.

MARIN MUNICIPAL WATER DISTRICT'S DRINKING WATER SOURCES



Supply from **local surface water reservoirs**

and



SCWA's Russian River water system



Delivers an average of **25,300 AFY**



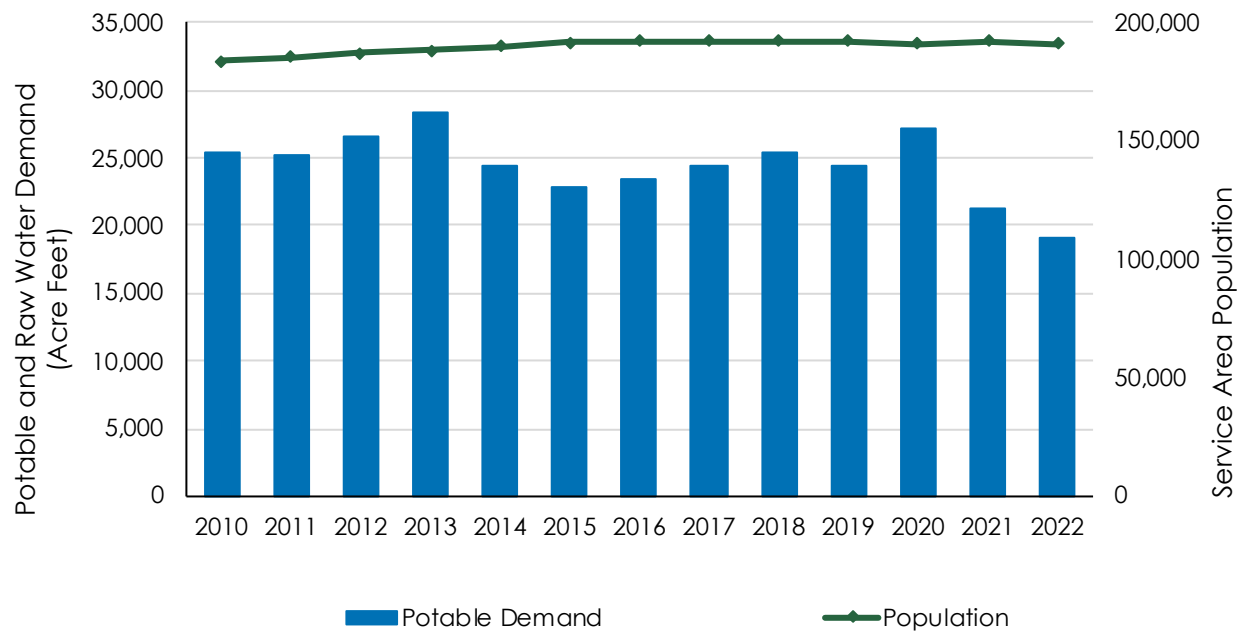
Serves approximately **191,300 customers**



HISTORICAL LOOK AT WATER DEMANDS

Water use trends are significantly influenced by historic drought conditions, mandatory statewide restrictions in urban water use, and local drought response. California has variable hydrology with frequent dry periods, and its water resources have historically been stressed by periodic droughts, including some multiyear droughts that severely threatened water supply reliability.

Marin Water Historical Potable Water Demand and Population



DEMAND DRIVERS OVER TIME

- 1971** The District's programs for demand management through water conservation began when water conservation literature from the American Water Works Association (AWWA) was inserted into water bills.
- 1977** The District experienced a severe drought, prompting Marin Water to implement several demand management restrictions that resulted in residents cutting water use by 57% during the drought.
- 1994** Water Efficient Conservation Master Plan identified existing programs to retain and new programs to implement.
- 1997** Water Conservation Action Plan detailed marketing efforts and progress made implemented the 1994 Water Efficient Conservation Master Plan.
- 2001** The District conducted a Review of Conservation Activities to identify programmatic changes for additional significant and long-lasting conservation savings.
- 2006** The District developed the Water Management Report to calculate the current baseline for potential program savings.
- 2007** Water Conservation Master Plan built on the 2006 report to develop programs to achieve water savings.
- 2015** The District conducted a Long-Term Demand and Conservation Program Analysis to evaluate conservation savings potential through 2040.
- 2021-2022** The District experienced the worst drought on record. Marin Water's Board of Directors declared a water shortage emergency in April 2021. As a result, Marin Water implemented demand management restrictions and accelerated new water efficiency programs and outreach that resulted in water use within the service area decreasing by approximately 30% compared to 2020 demands.
- 2024** The District developed the Water Efficiency Master Plan to identify innovative ways to advance water efficiency.
- TODAY** Today into the future: Climate change is predicted to increase the frequency and severity of droughts in California. Temperature increases may also lead to demand increases. Therefore, robust water use efficiency programs will continue to play a vital role in managing limited water resources during future droughts.



Continued:

In 2021, the District experienced the worst drought on record following two very dry consecutive years that resulted in historically low reservoir storage levels. As a result of this historic drought, Marin Water implemented several demand management restrictions and launched new water efficiency programs and outreach. Water use within the Marin Water service area declined significantly in response to the drought restrictions, with the total water use decreasing by approximately 30% between 2020 and 2022 due to Marin Water's accelerated implementation of water efficiency efforts and customers' drought response.

Climate change is predicted to increase the frequency and severity of droughts in California. Increases in temperature may also lead to increases in demand. Therefore, robust water use efficiency programs will continue to play a vital role in managing limited water resources during future droughts, and programs can be scaled up as needed to meet short-term demand reduction targets.

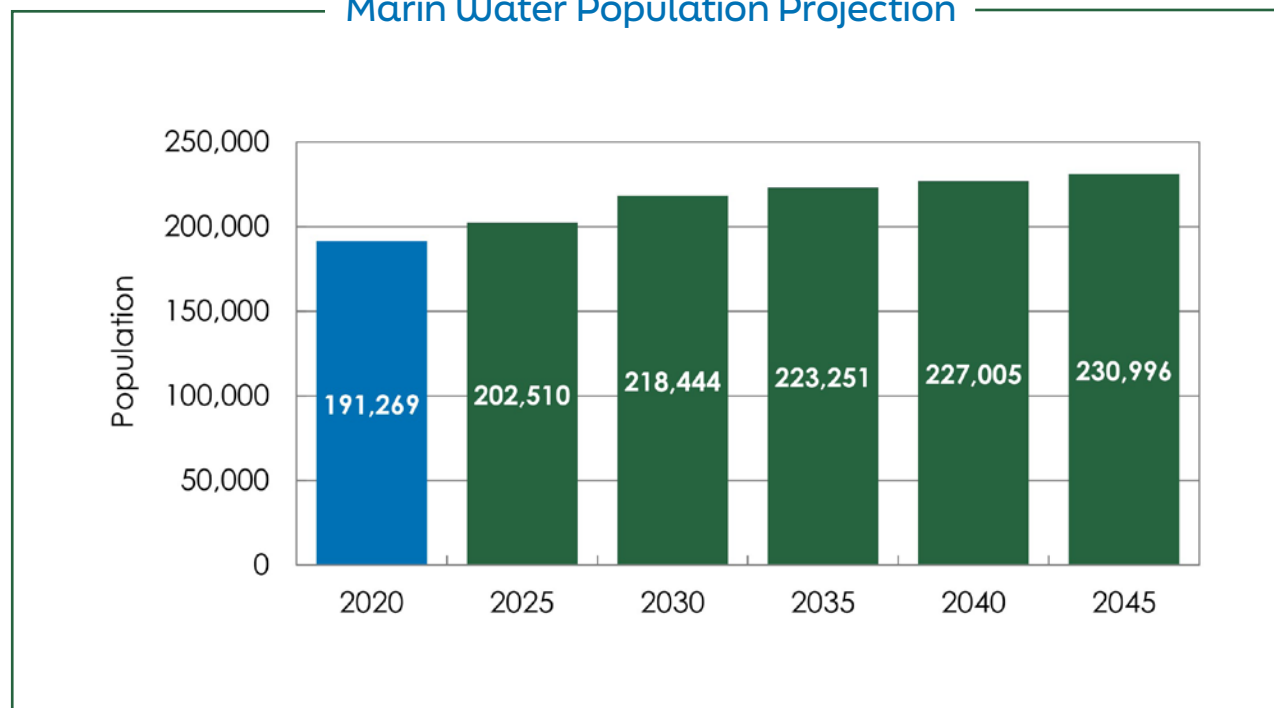
CHARACTERISTICS OF THE MARIN WATER CUSTOMER BASE

Population growth projections are a cornerstone of water planning. Marin Water revisits population forecasts every five years in its Urban Water Management Plan (UWMP). The 2020 UWMP forecasts project that Marin Water's customer base is expected to increase from the current estimate of approximately 191,300 people in 2020 to almost 231,000 people in 2045.

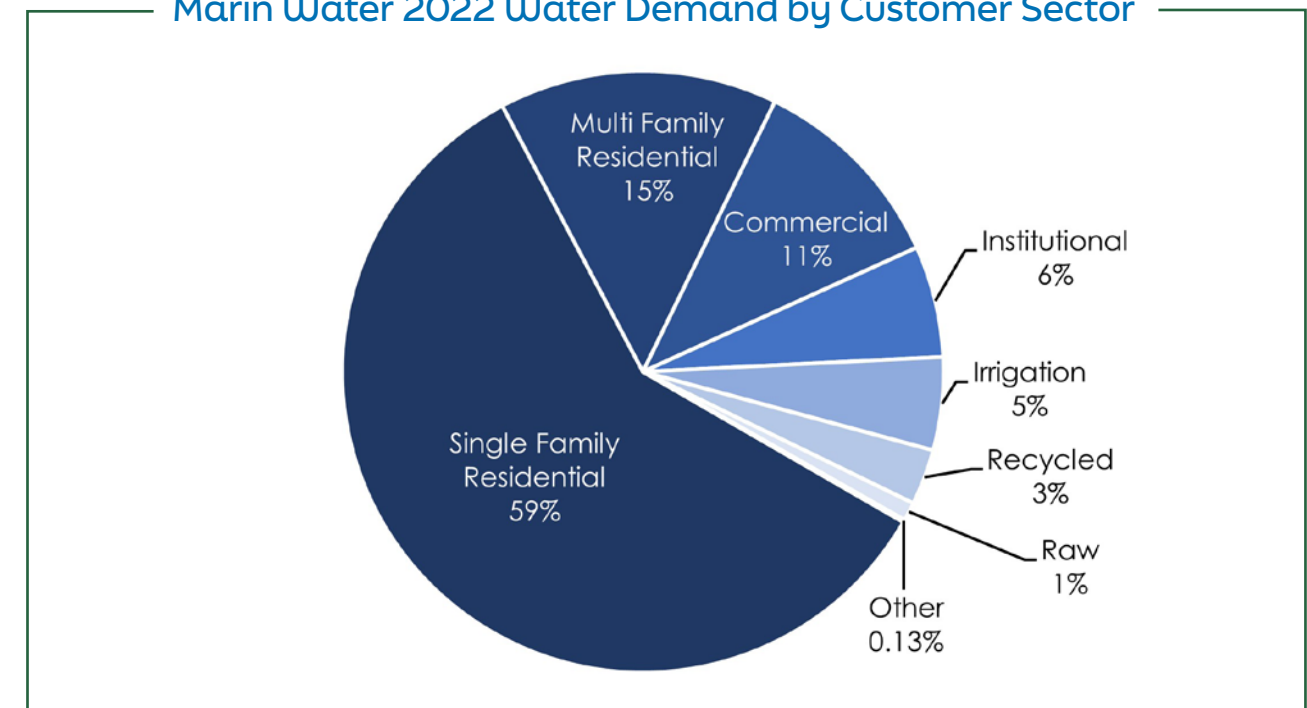
Marin Water serves a wide variety of water customers. Water use within the District's service area is predominantly associated with residential use, with single family and multi-family residential customers accounting for 74% of total water use in 2022. Commercial meters made up 11% of the total water use, landscape meters made up 5% of the total water use, and institutional/governmental meters made up 6% of the total water use. The direct use of recycled water has contributed to reduced consumption by providing non-potable water for landscape irrigation, cooling towers, car washes, and toilet flushing within the community.



Marin Water Population Projection



Marin Water 2022 Water Demand by Customer Sector

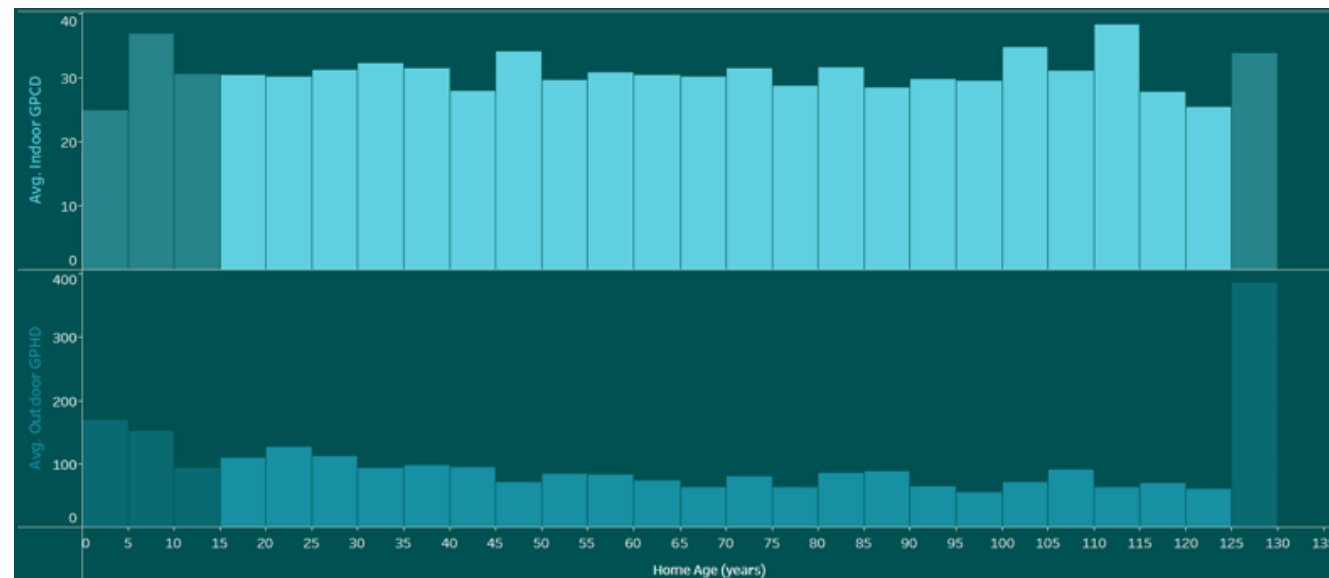


Water Use Patterns

The District initiated water conservation programs in 1971 by incorporating water conservation literature from the American Water Works Association (AWWA) into water bills. By the mid-1970s, these efforts had expanded to include retrofitting water-using fixtures, and they have since grown over the past 50 years. Marin Water's extensive water use efficiency initiatives have led to highly efficient water use among its customers.

While water consumption varies widely among different customer classes, comparing residential households is relatively straightforward due to similar property types. A Residential End Use Study (Study) analyzed water consumption from January 2022 through March 2023 for 2,304 single-family residential customers equipped with Flume devices. The Study indicates that indoor water usage remains relatively consistent across homes of different ages, suggesting widespread adoption of efficient indoor fixtures regardless of a home's age.

Single Family Residential Water Use Based on Home Age

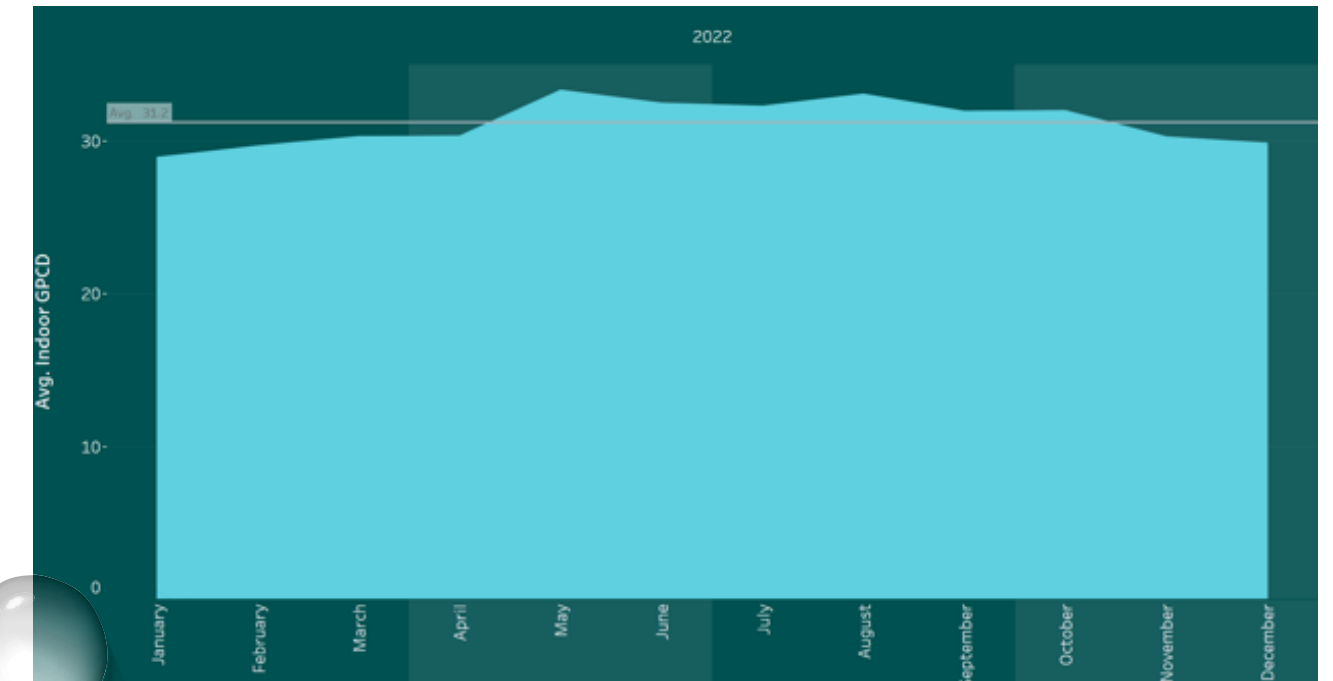


Adopted from the Flume Dashboard, updated on 13 April 2023.

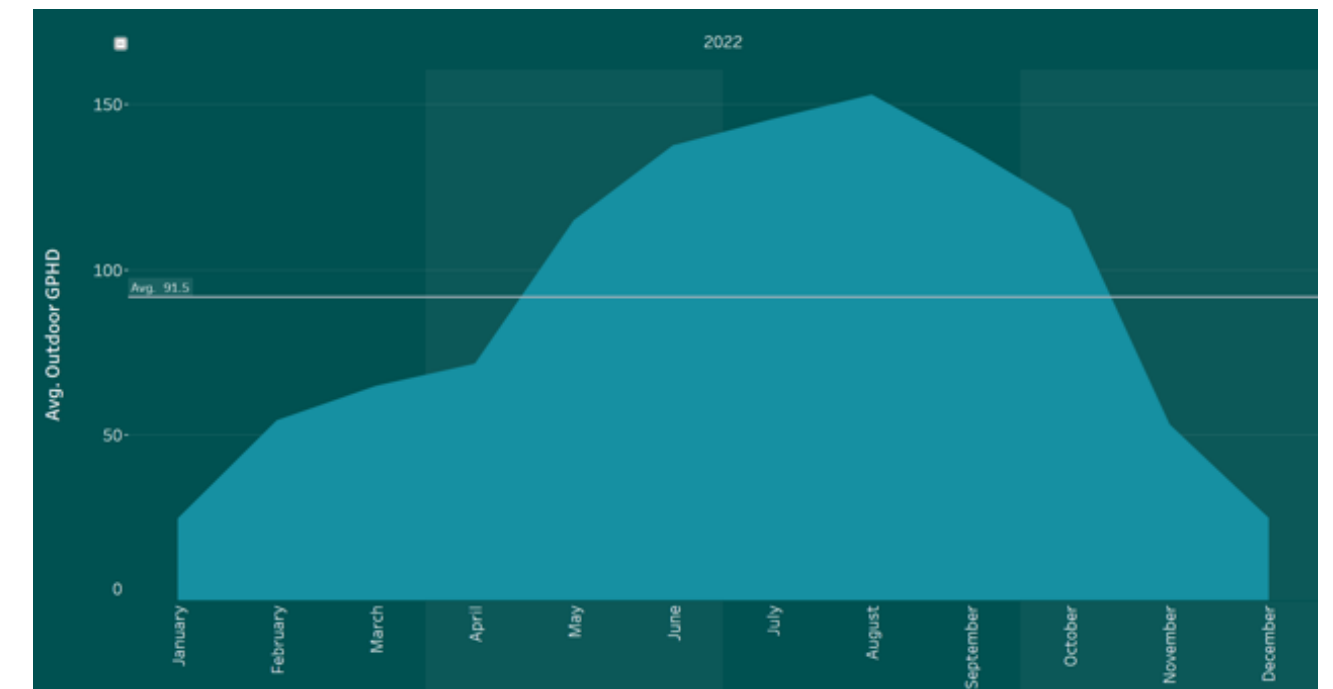
The study found that the average indoor water use is approximately 31 gallons per capita per day (GPCD), while the average winter usage for all residential customers within the District's service area is 46 GPCD. For comparison, the national indoor average in 2016 was approximately 55 GPCD. The total per capita water use for the Study participants is 62 GPCD, slightly lower than the Districtwide residential average of 68 GPCD in 2022. While the study group may appear slightly more efficient and may not fully represent all Marin Water residential customers, their water usage patterns can offer insights into general community acceptance of water-saving practices, fixture saturation, and irrigation habits.

Monthly indoor water usage among the study group appears consistent throughout 2022, while outdoor usage varies more, with significantly higher demand in the summer months due primarily to outdoor irrigation needs.

Estimated Monthly Indoor Water Use for Single Family Residential Customers



Estimated Monthly Outdoor Water Use for Single Family Residential Customers



Adopted from the Flume Dashboard, updated on 13 April 2023.



ADVANCING CONSERVATION WITH TECHNOLOGY AND ANALYSIS

Advanced Metering Infrastructure

Over recent years, the District has made significant strides in enhancing water use efficiency through the implementation of advanced technologies and comprehensive analyses. The District completed three Advanced Metering Infrastructure (AMI) pilot projects resulting in the installation of over 5,000 AMI meters in the service area, including on all dedicated irrigation accounts. AMI is an educational tool that provides customers with further opportunities to use water wisely. Customers in the AMI Pilot Program have access to real-time water use data and receive timely notifications of water use patterns indicative of leaks. Approximately 43% of customers have established the required third party online account to access their AMI data, of those, 96% have set up leak alerts through the portal. Due to limited customer engagement with the third party online portal, staff also create automated reports to monitor the water use of AMI accounts to provide notifications of potential leaks and high water use. An AMI Feasibility Study was completed in October 2020 to evaluate districtwide deployment of AMI technology which would allow customers to monitor their water consumption in real-time and continue to make informed decisions about water usage.

Flume Meters

The District's understanding of customers' water use patterns has recently been advanced with the implementation of the Flume rebate program. Flume meters provide high-definition water data for individual customers. Flume uses patented technology to detect usage down to one-hundredth of a gallon.

Flume meters help customers use water efficiently by identifying potential leaks and irregular water consumption patterns. Flume meters also recognize flow patterns for certain types of indoor and outdoor fixtures, facilitating an understanding of household water usage. As a result, the data from Flume meters can be used to differentiate indoor and outdoor water use as well as water use from various fixtures such as toilets and washing machines. To date, the District has installed approximately 2,500 Flume meters through a District rebate program. Continued emphasis on Flume meters and similar technologies that empower customers to better understand their use and conserve water will continue to shape water use efficiency in the future.



In both 2022 and 2023, Flume Data Labs completed Residential End Use Studies to evaluate the water use patterns for Flume customers. These analyses provided the following insights:

- Approximately 68% of toilets flush at 1.5 gallons per flush or less.
- Approximately 48% of clothes washers use less water than the 2023 EnergyStar Most Efficient models.
- Homes with pools, constituting approximately 18% of households in the service area, tend to use more than twice the amount of outdoor water than homes without a pool.
- The primary type of irrigation in July 2023 included 30% sprinkler irrigation, 54% drip irrigation, 11% hose irrigation, and 5% no irrigation.

When regularly completed, the Flume Residential End Use Studies can help Marin Water track fixture efficiency, water use trends and patterns. Over time, Marin Water will better understand whether Flume users are a good proxy for single-family residential customers.





Analytics to Advance Conservation

The District leverages analytics to the greatest extent possible to inform the decision-making process in selecting and designing water efficiency programs. Through comprehensive analysis of data from technologies like AMI and Flume, Marin Water gains valuable insights that help the District continually optimize programs to the benefit of the District and its customers. Third-party data from Flume and AMI has demonstrated the value of increasing detailed consumption data available to customers. Additionally, this data presents an opportunity to monitor program participation trends, evaluate program effectiveness and track water savings with more accuracy.

However, due to the challenges with integrating the third-party data, it is often difficult to decipher the impacts of each individual measure on water savings. Turn-key integration could enhance Marin Water's analytical capabilities, enabling a greater understanding of the impacts of each water-saving action and more effective marketing of water use efficiency initiatives. Marin Water is also continuously looking for opportunities to administer its programs efficiently and ensure programs remain cost-effective.

What's Next?

- Continue emphasis on measures that empower customers to enhance their water use efficiency, including the adoption of AMI, Flume meters, and similar technologies. These technologies not only help customers gain insights into their water use, but also provide Marin Water with valuable data to monitor savings and better understand the lifespan of water savings.
- Conduct and analyze findings from AMI pilots to determine the most effective marketing and outreach strategies to prepare for systemwide AMI deployment.
- Conduct an annual Residential End Use Study to inform changing water use trends, fixture saturation, and water reduction opportunities. This annual assessment will be utilized to propose program modifications to maximize water savings and align the program priorities with the areas of greatest water saving potential.
- Identify additional opportunities to leverage technology, especially methods for tracking customer participation in Marin Water's programs through implementation of a Customer Service Portal, which would include:
 - Allowing customers to view their water use history and calculate their household GPCD.
 - Allowing customers to submit rebate applications electronically and provide the capability for automatic tracking as the rebate is processed.
 - Simplifying the process for tracking program participation.
- Maximize customer engagement and the utilization of leak alerts for current and new AMI accounts through a single log-on for accessing District services, eliminating the need for a separate sign-in from a third party to establish leak alerts and view water use histories.

2 STATE REGULATIONS THAT DRIVE WATER EFFICIENCY.....

The District has a long history of prioritizing water use efficiency, which has played an important role in demand management for the past few decades. The regulatory landscape has significantly contributed to promoting increased conservation practices and fostering a more efficient utilization of water resources. Past, current, and anticipated policies and regulations influence which water use efficiency activities Marin Water implements and how they are implemented within the service area.

PAST STATE WATER USE EFFICIENCY REGULATIONS

While Marin Water customers have a long-standing commitment to water efficiency, the State has taken a role in ensuring all water utilities strive for demand reductions.

Water Conservation Act of 2009

The Water Conservation Act of 2009 (also known as SB X7-7) required the State to reduce urban water use by 20% by the year 2020. Each urban retail water supplier was required to develop a baseline daily per capita water use in their 2010 UWMP and establish per capita water use targets for 2015 and 2020 in order to help the State achieve the 20% reduction by 2020. Under SB X7-7, urban retail water suppliers could either comply with their 2020 targets on an individual basis or as part of a regional alliance. The Sonoma Marin Saving Water Partnership Regional Alliance, which includes the District and eight other regional water retailers, used 113 GPCD in 2020, which was below its 2020 target of 129 GPCD.

Senate Bill 407

Senate Bill (SB) 407 was enacted in 2009 to accelerate the replacement of older, low-efficiency plumbing fixtures with new, more efficient fixtures that meet current water efficiency standards. Specifically, SB 407 required all single-family residential properties built prior to 1994 to be fully retrofitted to meet new high-efficiency water standards by 2017, and all commercial buildings and multi-family properties built before 1994 to be fully retrofitted by 2019. As of 2014, SB 407 requires non-compliant plumbing fixtures properties to be replaced with water conserving plumbing fixtures when a property is undergoing additions, alterations, or improvements. Marin County requires compliance with SB 407 for issuance of building permits.



CURRENT STATE WATER USE EFFICIENCY REGULATIONS

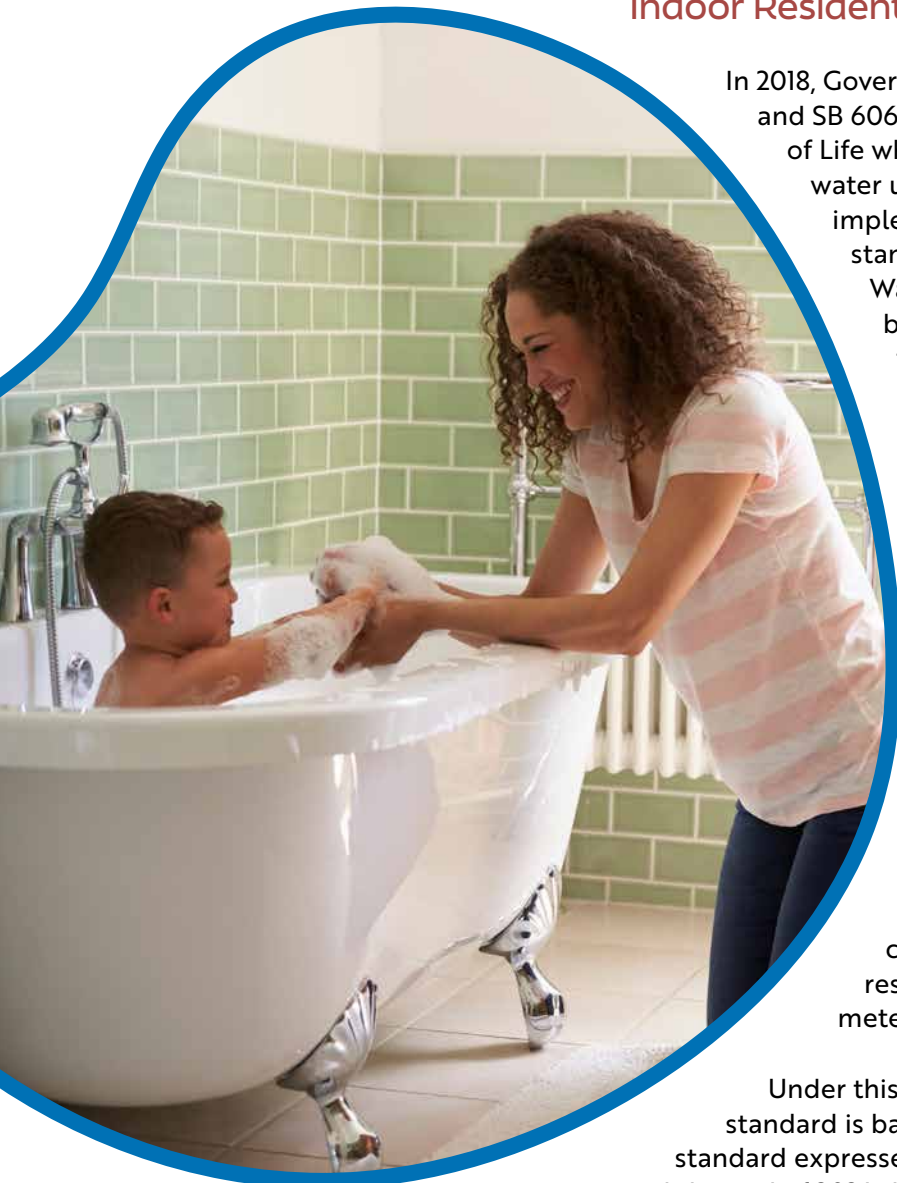
There are various statewide regulations currently in place to use water more wisely and eliminate water waste, including requirements to reduce indoor residential water use, distribution system water loss, and outdoor irrigation of nonfunctional turf and landscapes. Marin Water is committed to meet or exceed current and future regulatory requirements.

Indoor Residential Water Use Standard

In 2018, Governor Brown signed Assembly Bill (AB) 1668 and SB 606 Making Water Conservation a California Way of Life which included provisions for advancing urban water use efficiency through development and implementation of various water use efficiency standards. Collectively known as the Long-Term Water Use Efficiency Framework, these bills build on the SB X7-7 and form a foundation for conservation and drought planning in the State. AB 1668 and SB 606 directed the California Department of Water Resources (DWR) and the State Water Resources Control Board (State Water Board) to adopt numerical standards for lowering aggregate statewide urban water use beyond SB X7-7.

The Long-Term Water Use Efficiency Framework created a new budget-based approach to conservation wherein water utilities will be given an aggregate maximum water use target that they are required to meet. The target, or urban water use objective (UWUO), for urban retail water suppliers is based on four components: indoor residential use, outdoor residential use, outdoor CII use with dedicated meters, and water loss reduction.

Under this legislation, the residential indoor water use standard is based on population and an indoor water use standard expressed in GPCD. The initial standard is 55 GPCD until the end of 2024, 47 GPCD beginning in 2025 through 2029, and 42 GPCD beginning in 2030 and beyond. As previously described, the average indoor water use for SFR homes with Flume devices is approximately 31 GPCD. Assuming that this is representative of the average use of all SFR and MFR residential customers within the District, the District is in compliance with the current indoor residential water use standard.



Water Loss Standard

California Water Code (CWC) §10608.34 required the State Water Board to develop water loss performance standards for each urban retail water supplier to minimize water waste through system leaks. Per the Individual System Water Loss Standard released by State Water Board in August 2023, the water loss standard for the District is 28.5 gallons per connection per day, which is less than the District's calendar year 2022 real water loss of 19.7 gallons per connection per day. Based on the most recent information, the District is in compliance with the water loss standard.

Nonfunctional Turf Ban

Nonfunctional turf is turf that is decorative and has no other functions, such as turf located within street rights-of-way and parking lots. In 2023, Governor Newsom signed AB 1572 prohibiting the use of potable water for the irrigation of nonfunctional turf located on properties owned by local governments beginning 2027; all other commercial, industrial, and institutional properties beginning 2028; common areas of homeowners' associations, common interest developments, and community service organizations beginning 2029; and all properties owned by local governments in disadvantaged communities beginning 2031 or when State funding for turf replacement is available.

On March 15, 2022, the District Board of Directors established Marin Water as a leader in the non-functional turf movement. A prohibition was passed preventing the use of District water for irrigating any new or rehabilitated ornamental lawn in commercial and municipal landscapes, effective April 2022.

Model Water Efficient Landscape Ordinance

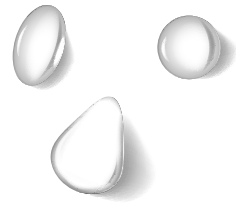
Outdoor water use is regulated by the California Model Water Efficient Landscape Ordinance (MWELo), California's water efficiency law for new and renovated landscapes. The MWELo sets limits on high water use plants and irrigation equipment and incentivizes a holistic approach to landscaping that incorporates healthy soils, adapted plants, and alternative water supplies like graywater, harvested rainwater, and recycled water. The MWELo requires that the annual estimated total water use for landscape irrigation not exceed the Maximum Applied Water Allowance (MAWA). While land use authorities such as cities and counties are responsible for enforcing MWELo compliance, Marin Water utilizes in-house landscape expertise to conduct MWELo compliance on behalf of the local jurisdictions due to additional applicability standards.

The Long-Term Water Use Efficiency Framework Primary Goals are to promote:

1. Use water more wisely
2. Eliminate water waste
3. Strengthen local drought resilience, and
4. Improve agricultural water use and efficiency and drought planning.



FUTURE STATE WATER USE EFFICIENCY REGULATIONS



Meeting future regulations is an important driver for continued enhancement of urban water use efficiency within the District. Major anticipated water use efficiency regulations include the implementation of UWUOs and updates to MWELO.

Other Standards for District's Urban Water Use Objective

As previously described, the Long-Term Water Use Efficiency Framework established a new framework for advancing urban water use efficiency through the development and implementation of various water use efficiency standards. The State Water Board released the proposed regulatory text for the UWUOs in August 2023, and it is anticipated that the text will be considered for adoption in the summer of 2024, with implementation scheduled for the fall of 2024. Starting in 2025, urban retail water suppliers are required to submit annual reports to DWR assessing whether they met the UWUO.



Urban Water Use Objective



Updated Model Water Efficient Landscape Ordinance

DWR is proposing to amend MWELO to simplify and clarify the requirements of the ordinance to facilitate local implementation and improve compliance. It is anticipated that the proposed changes will not impact Marin Water's current MWELO implementation. The final regulations are anticipated to be considered for adoption by DWR in 2024. Any changes to District code to comply with the updated MWELO will be brought forward for the Board's consideration.

What's Next for Future State Water Use Efficiency Regulations?

- Develop educational materials to ensure tree health is maintained as the State and local non-functional turf regulations are implemented to achieve the goal of removing 70,000 square feet of non-functional turf per year.
- Continue tracking the development of the new UWUOs to ensure the District meets or exceeds the regulations.
- Update District code to meet or exceed the State's MWELO.



3 HELPING OUR CUSTOMERS SAVE WATER

Early investments in water conservation accelerated Marin Water’s reduction in per person water usage. Since the mid-1970s, the District’s water use efficiency programs have continued to expand. Existing programs are comprised of a broad mix of water efficiency measures and include award-winning innovations. Residents are more aware of water as a valuable resource by participating in programs, events, and workshops. As a result, Marin Water customers’ current water use is among the most efficient in California.

WE DID THE EASY STUFF. CAN WE SAVE MORE?

The District’s service area boasts robust customer participation in water use efficiency. Over 8% of all residential accounts participated in at least one water use efficiency program between 2020 to 2022. Of the accounts that participated, 28% participated in two or more programs. With this long history of success, is there more to be accomplished? Can proactive conservation programs continue to accelerate reductions in water use? The answer is yes!

The District knows that there are more opportunities to save because it works with customers every day and it is aware that water use patterns can change. Some surprising facts related to water use efficiency:

- The average household’s leaks can account for nearly 10,000 gallons of water wasted every year and ten percent of homes have leaks that waste 90 gallons or more per day, according to the United States Environmental Protection Agency (US EPA) Fix-a-Leak Week Findings.
- Americans underestimate daily water consumption by over 90% according to the 2021 American Water Imagine a Day without Water Survey of Key Findings.
- More than half of homeowners believe they use 10 to 30% of their overall water outdoors, while in reality most homeowners use 30 to 60% of their water outdoors, according to the 2019 Alliance for Water Efficiency (AWE) Landscape Transformation Executive Summary.

Recognizing that water use patterns vary greatly within each customer class served, Marin Water analyzes customers to understand their use patterns and identify what they care about before creating tailored programs and education messages to meet their needs and save water.

Establishing Goals

While Marin Water is delighted that its customers are among the most efficient users in the State, there is still water to be saved. A recent analysis included in **Appendix A** concluded that if all of Marin Water’s customers were at the maximum level of water use efficiency, the District could save approximately 7,900 AFY by 2045. However, this

figure represents a “theoretical ceiling” that is likely unattainable given that no system is ever 100% efficient. Recognizing this limitation, Marin Water chose to evaluate the remaining conservation savings potential through 2045 using a balanced approach – not setting the target too low by solely looking at passive savings, but also not setting the target unattainably high by assuming all customers will maintain water use at drought response levels, all fixtures will be efficient, and all new developments will operate at maximum efficiency.

With this approach, it is estimated that Marin Water can achieve approximately 4,160 acre-feet per year (AFY) of additional water savings by implementing incentives, additional customer support programs, and innovative pilot projects through 2045. This includes approximately 2,480 AFY in passive savings and approximately 1,680 AFY in active savings.

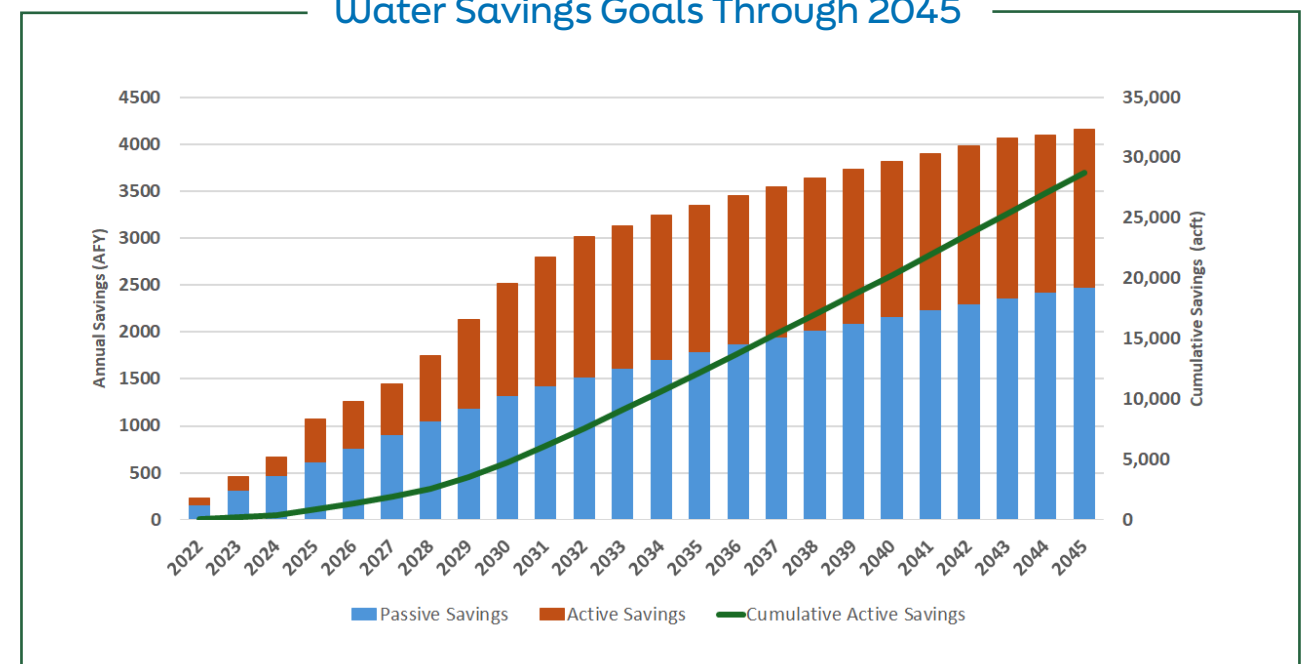
Consistent with these findings, Marin Water established short-term, mid-term, and long-term goals to support the realization of this savings target. By 2025, Marin Water aims to achieve 1,070 AFY of additional water savings through the ongoing implementation of existing actions and programs. By 2035, Marin Water aims to achieve 3,350 AFY in additional water savings through the implementation of additional programs and outreach efforts. By 2045, Marin Water anticipates 4,160 AFY of additional water savings by implementing cost-effective programs, additional customer support programs, and innovative pilot projects. Assuming a population of almost 231,000 people by 2045 and a savings target of 4,160 AFY, Marin Water expects to reduce its total per capita water consumption by approximately 14 GPCD. These goals reflect Marin Water’s commitment to sustainable water management practices and dedication to maximizing efficiency over time.

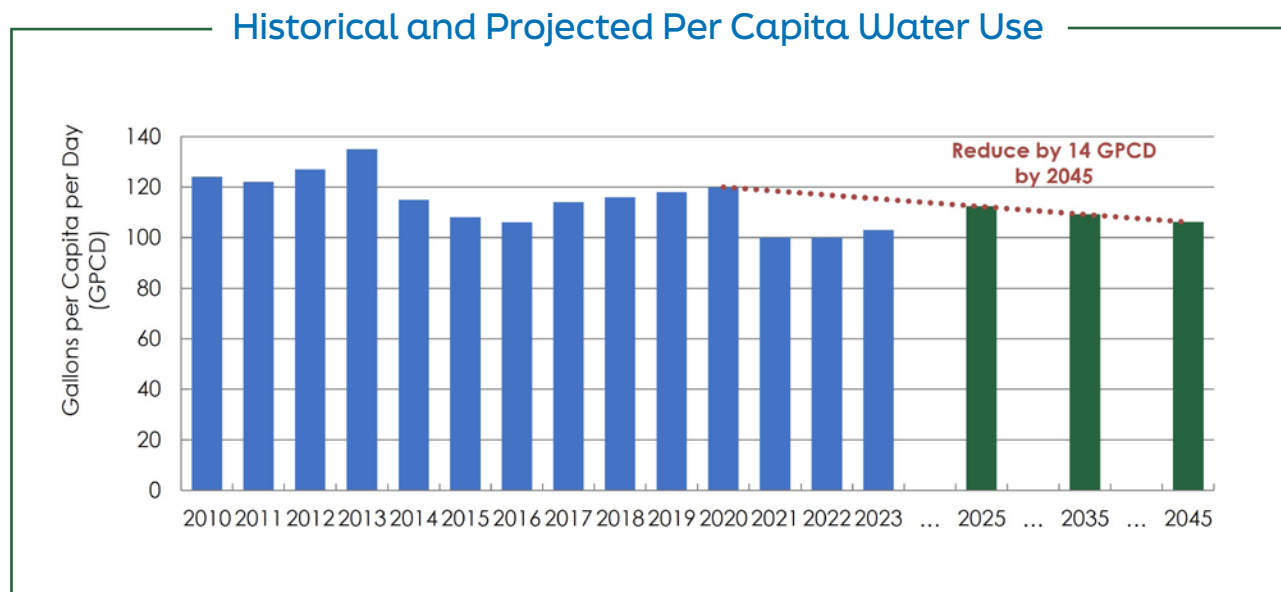


Passive savings include reductions in water demand resulting from codes, standards, and legislation.

Active savings result directly from Marin Water’s water use efficiency programs.

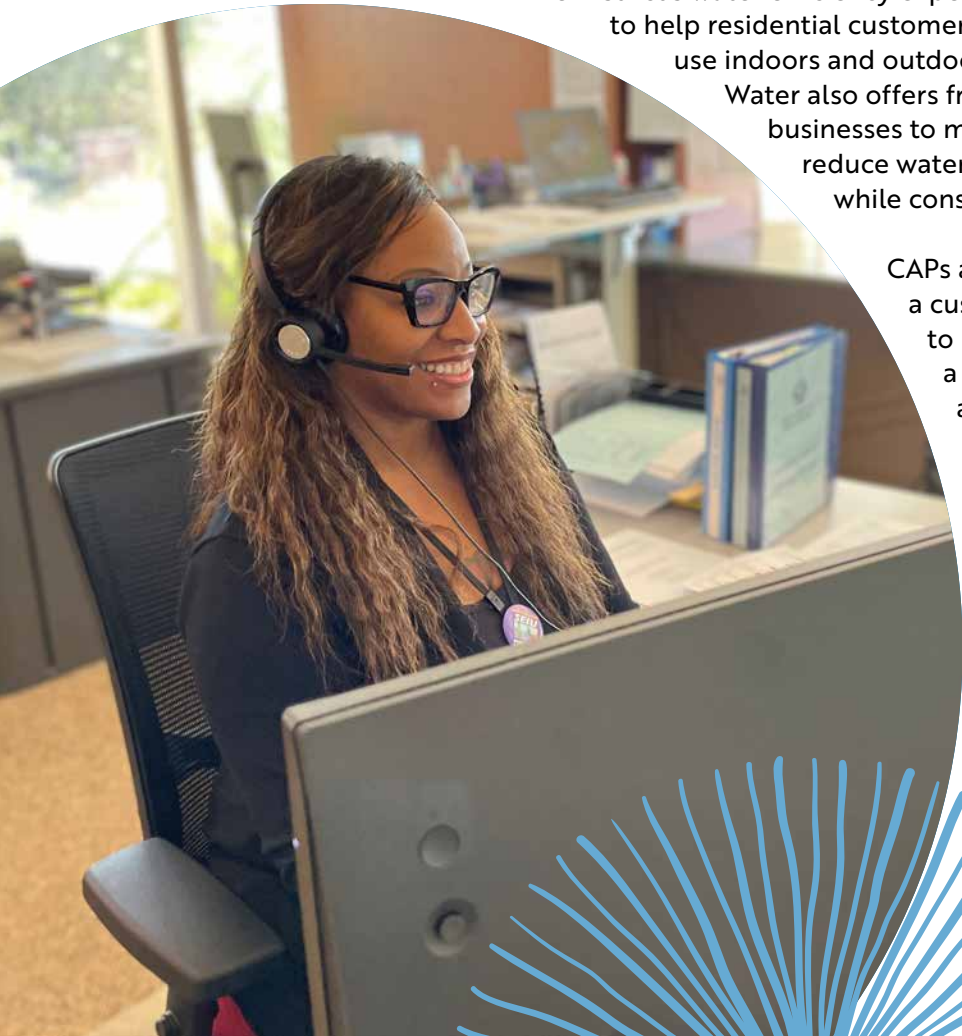
Water Savings Goals Through 2045





CONSERVATION ASSISTANCE PROGRAM: CONSERVATION DELIVERED TO YOU

Since 1995, the District has worked with residential and commercial customers through the Conservation Assistance Program (CAP) to find water savings based on the customer's unique needs. The District's water efficiency experts provide free home consultations to help residential customers identify ways to reduce their water use indoors and outdoors and reduce water bills. Marin Water also offers free, onsite water use consultations for businesses to make operations more water efficient, reduce water bills, and improve the bottom line, while conserving precious water resources.



CAPs are often the initial interaction with a customer interested in taking action to reduce their water use, understand a high water bill, and/or learn more about the incentive programs offered. Marin Water completed 1,852 CAPs from 2020 to 2023. As AMI and Flume expand, some CAPs can be completed via phone calls, reducing the overall cost of the program and increasing staff capacity to assist customers.

INCENTIVES TO SUPPORT CUSTOMERS TAKING ACTION

Marin Water offers a diverse package of rebates and money-saving incentive opportunities to help customers lower water usage. Saving water is not just about saving money on water bills, it is also about managing natural resources and building a more sustainable future. For more information about Marin Water's active rebate programs, please visit marinwater.org/rebates.

Cash for Grass Program

Lawns typically need four times more water than climate-appropriate shrubs and perennials, which makes converting lawns to sustainable landscapes one of the best ways to use water more efficiently. Marin Water offers two rebate tiers to customers for reducing the amount of lawn area in their landscapes. The best practices rebate provides up to \$3 per square foot for projects that follow best management practices to optimize long-term water savings, including:

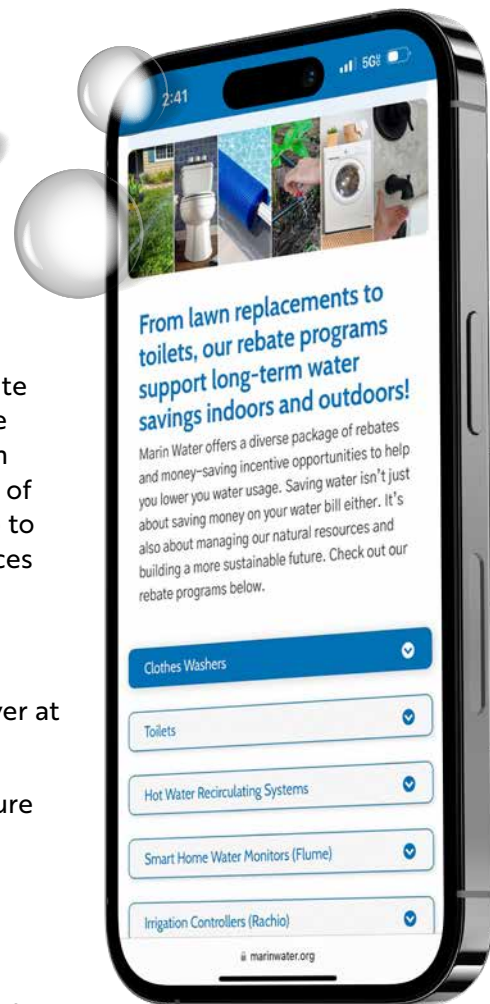
- Sheet mulching in place versus physical removal of lawn.
- Installation of mostly California native low water use plants over at least 50% of the project area based on mature plant size.
- Installation of an alternative water source or stormwater capture feature such as a rain garden, rainwater harvesting cistern, or graywater system.

Marin Water also provides a standard rebate of \$1.50 per square foot that has fewer requirements to provide customers with more flexibility while still achieving water savings. Both rebates are capped at 1,000 square feet for residential sites and 5,000 square feet for commercial sites. Since the implementation of the Cash for Grass Program in 2021, 482,000 square feet of lawn has been replaced.

Hot Water Recirculating Systems

Hot water recirculating systems are a proactive solution to mitigate water loss experienced while waiting for water to reach optimal temperature when using showers and faucets. Marin Water highly recommends that both residential and commercial customers consider installing hot water recirculating systems to effectively reduce water waste. To encourage adoption, Marin Water offers a rebate of up to \$50 for the purchase and installation of these systems.

It is important to note that the water-saving benefits associated with hot water recirculation systems can vary significantly depending on the plumbing fixture layout of each site. However, for customers experiencing long wait times for hot water, this technology can yield substantial water conservation benefits.



Smart Irrigation Controllers

Rachio

Marin Water has collaborated with Rachio and the California Water Efficiency Partnership (CalWEP) to provide Marin Water's customers with significant discounts on Rachio 3 Smart Sprinkler Controllers (Rachio 3 Controllers). Under this program, the 4-zone model is priced at \$40, the 8-zone model at \$70, and the 16-zone model at \$90. Since its inception in 2021 until 2023, a total of 578 Rachio 3 Controllers have been distributed.

The program's success can be attributed to its customer-friendly, direct distribution approach—participants face no paperwork requirements or upfront costs to be reimbursed. Notably, 76% of all Rachio 3 Controllers were distributed through the Direct Distribution Program, showcasing the effectiveness of this model.

WaterSense Smart Controller Rebate

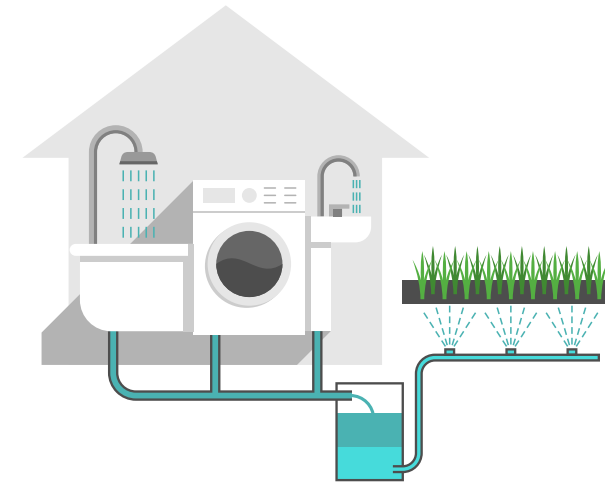
When installed, programmed, and maintained correctly, WaterSense Smart Controllers have the capability to mitigate overwatering and yield substantial water savings. Marin Water extends a rebate of up to \$100 to customers who install eligible WaterSense labeled irrigation controllers. Between 2021 and 2023, Marin Water provided a total of 173 rebates for WaterSense Smart Controllers, accounting for 23% of the overall smart controller incentives provided during that period.

Rain Bird RC2

Beginning in 2024, Marin Water's partnership with Flume is helping provide big discounts on Rain Bird RC2 8-station irrigation controllers, which will soon integrate with the Flume meters to transform the way customers water their landscape. Normally priced at \$230, these discounted controllers are available for a limited time to Marin Water customers for just \$50.

Smart Home Water Monitors (Flume)

Since 2021, Marin Water has offered Flume monitors for less than \$50, after installation (and shipping and handling), to single family residential customers. This Direct Distribution Program is made possible through a partnership with Flume and CalWEP and results in a discount off the retail price for Marin Water customers. The Flume meter is easy to install and attaches to existing water meters. As previously described, Flume gives customers information about their water use, potential leaks, and incidences of high water use in real-time. Leak notifications can be sent directly to customers' smartphones. Flume teaches customers about their water trends and how they can be water-efficient.



Laundry-to-Landscape Graywater Program

Marin Water offers the Laundry-to-Landscape Graywater Program to customers to reduce the overall reliance on potable water for irrigation. Graywater is water from bathtubs, showers, bathroom sinks, washing machines, and laundry tubs. A common and great way to reuse graywater is landscape irrigation. Marin Water has partnered with the Urban Farmer Store to offer a \$125 discount for customers who purchase a graywater kit. From 2020 to 2023, 59 graywater kits were incentivized for customers through the partnership with the Urban Farmer Store.

Pool and Spa Covers

Thoughtful residential swimming pool design and ongoing maintenance can help save pool owners water and money. Marin Water offers a rebate for qualifying models of up to \$100 for customers who purchase and install qualifying pool or spa covers, not to exceed the actual cost. The rebate was launched in 2021 to support the water shortage emergency response. Between 2021 and 2023, Marin Water provided rebates for 468 pool and spa covers.

Rain Barrel Rebate Program

Rainwater is a critical resource. Rainwater harvesting is the practice of collecting rainwater from rooftops and using it for irrigation purposes only. This practice can reduce reliance on potable water use for irrigation while also helping to limit erosion and polluted runoff that harm creeks. Customers with an active potable water service can apply for a rebate of up to \$0.50 per gallon of storage when they install rain barrels and/or cisterns at their sites. Total rebates are capped at \$1,000 per site and may not exceed the actual cost. In 2023, a 20,000-gallon cistern was rebated, the largest installation to date. Between 2020 and 2023, the average system capacity rebated through the program was 727 gallons.

US EPA estimates that, depending on climate, an uncovered 500 square foot pool could lose between 12,000 and 31,000 gallons of water per year due to evaporation.



One inch of rain will produce 600 gallons of water for every 1,000 square feet of roof area.





High Efficiency Clothes Washer Rebate Program

Marin Water customers can apply for a \$100 rebate towards the cost of installing a qualifying residential high-efficiency clothes washer that meets current water and energy efficiency requirements. The Consortium for Energy Efficiency (CEE) continues to ratchet down clothes washer standards, driving efficiency without the need for rebates.

According to the 2022 Residential End Use Study conducted by Flume Data Labs, 48% of Marin Water customers' loads use less water than the 2023 EnergyStar Most Efficient models, demonstrating clothes washer rebates may no longer be needed to promote market transformation. Marin Water has been offering clothes washer rebates since the early 2000s, and based on indoor water use patterns, this rebate now primarily supports freeriders.

High Efficiency Toilet Rebate Program



Marin Water offers a rebate of up to \$150 for replacing older toilets with new, high-efficiency models. Toilets must be on Maximum Performance (MaP) Testing's PREMIUM list and must be models that use 0.8 gallons per flush or less. MaP PREMIUM-rated toilets meet high standards for both water efficiency and performance.

Marin Water incentivized over 48,000 high-efficiency toilets between 1993 and 2019, with an additional 14,000 replaced through regulatory requirements. The implementation of State water use efficiency regulations has increased the availability of high-efficiency models, ensuring that all toilets available for purchase are efficient. Due to this regulatory-promoted market transformation, the rebate now primarily supports freeriders.

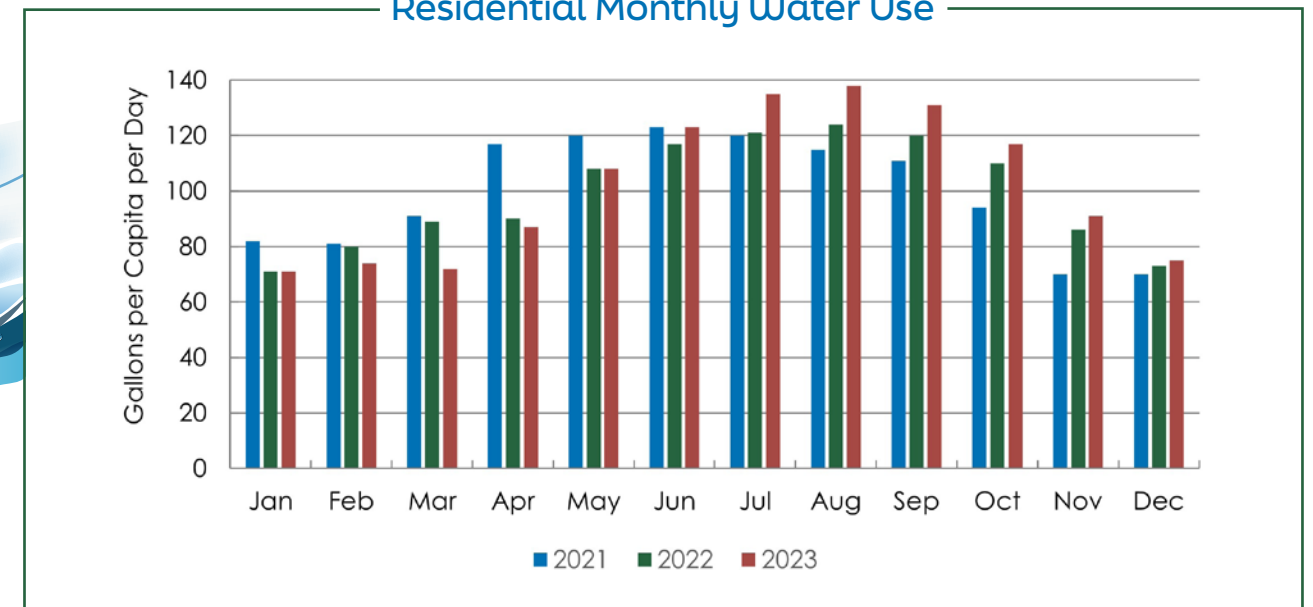
What's Next for Incentives to Support Customers Taking Action?

- Prioritize program offerings that have demonstrated success and show potential for additional savings, while phasing out programs such as the High Efficiency Toilet Rebate and the High Efficiency Clothes Washer Rebate that no longer yield significant savings due to factors like low participation, high-saturation rates, and free-ridership. See **Appendix B** for detailed Rebate Considerations.
- Expand and/or enhance existing program offerings to target demographics with historically below-average participation in programs, such as high-water users, rental customers, and low-income customers, aiming to reach additional savings potential and ensure more inclusive participation.
- Focus near-term initiatives on water efficiency programs aiming to transform short-term savings from drought response into long-term water use efficiency, particularly prioritizing programs that encourage and incentivize outdoor water use efficiency.
- Evaluate findings from pilot projects to determine if full-scale implementation aligns with program goals.

WATERSHED APPROACH TO LANDSCAPING: A GUIDE TO LANDSCAPE TRANSFORMATION

With water use nearly doubling in summer months, it is clear the greatest water savings can be achieved outdoors. Marin Water is committed to enhancing outdoor water use efficiency and advocating for locally-appropriate landscaping to use water wisely. While these gardens require less water, they are lush and evergreen because they were created following the principles of the watershed approach to landscaping. Marin Water maintains the Water Smart Gardening webpage and the Weekly Watering Schedule to support watershed-wise landscaping.

Residential Monthly Water Use

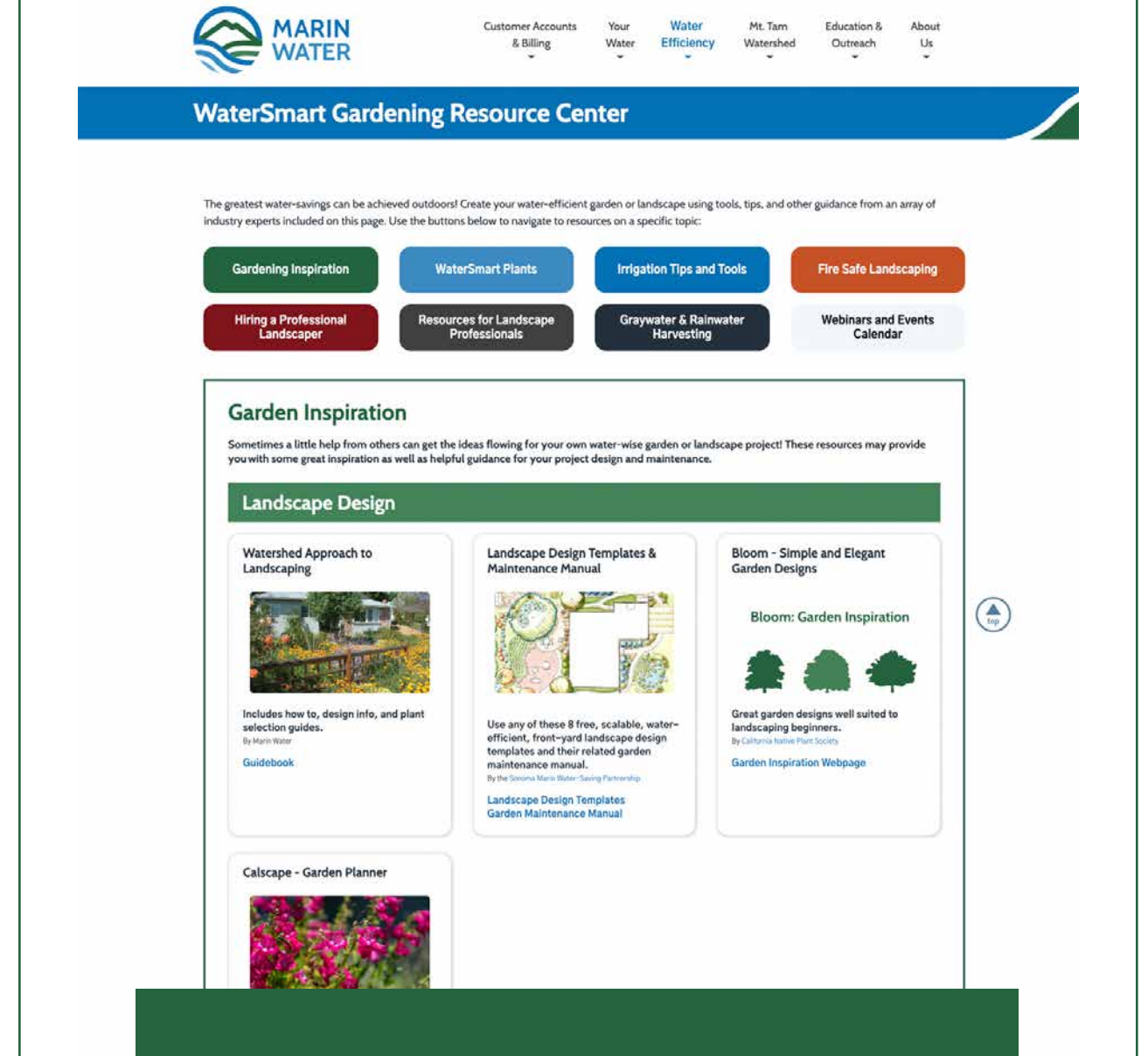




The online WaterSmart Gardening Resource Center provides tools, tips, and other guidance from an array of industry experts to create a water-wise garden and landscape. Resources provided include:

- The Marin Water Watershed Approach to Landscaping Guidebook which provides more than 110 water-wise plants, landscape design tips, gardening how-to, nurseries, and other resources for Marin Water customers;
- Garden inspiration for water-efficient projects, including landscape design, technical assistance, and demonstration gardens and tours;
- Water smart plant guide with resources for plants compatible with Marin's Mediterranean climate;
- Irrigation tips and tools to ensure customers can maximize outdoor water savings while ensuring plant health;
- Fire safe landscaping to reduce the risk of fire hazards;
- Database with qualified professional landscapers;
- Resources for landscape professionals including the latest water conservation practices and technologies; and
- Graywater and rainwater harvesting guides for water reuse.

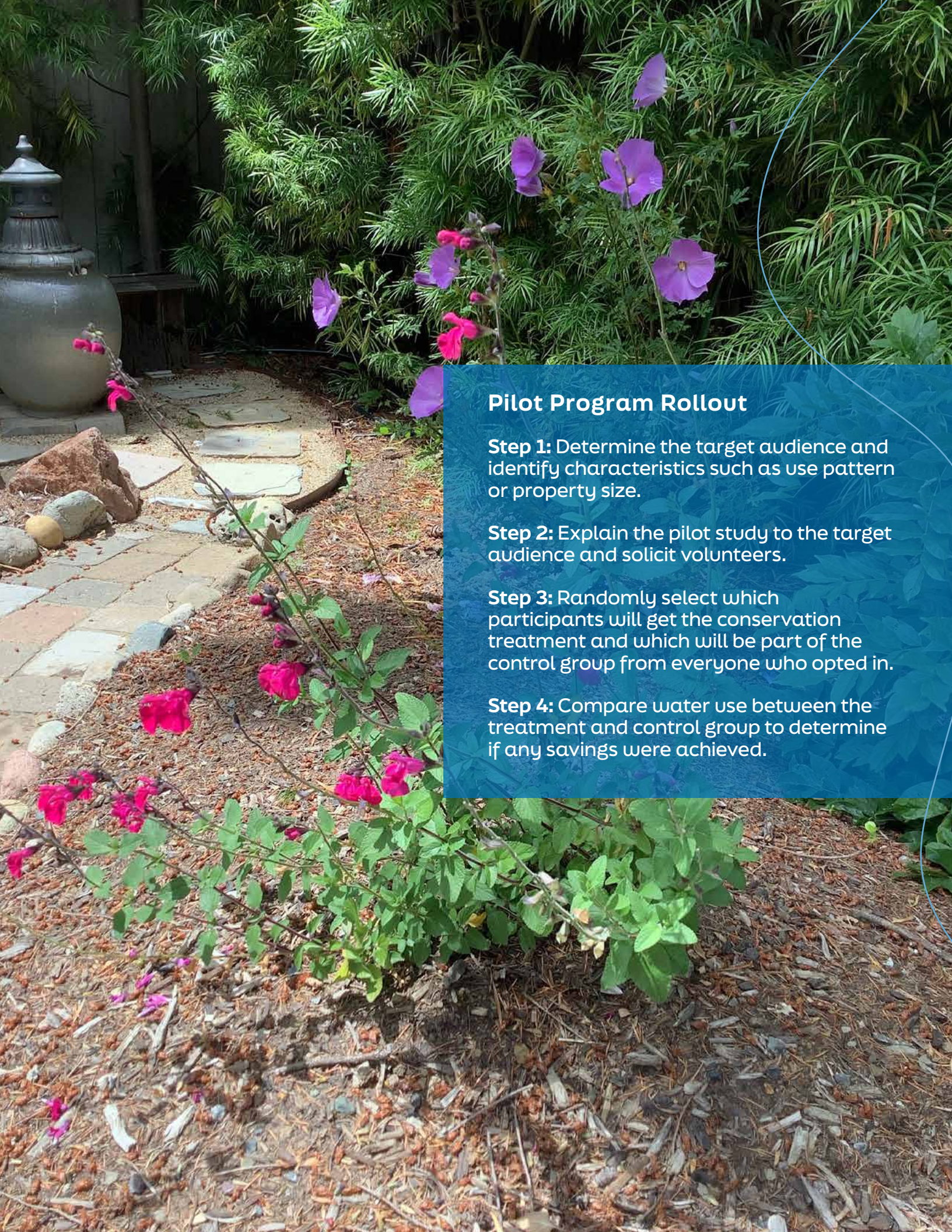
Snapshot of the WaterSmart Gardening Resource Center



THE WEEKLY WATERING SCHEDULE (WWS)

is an online guide that teaches customers how to water their garden as efficiently as possible based on irrigation equipment, plant type, and weather conditions. The WWS is updated every Friday during the irrigation season to align with the changing weather patterns throughout the year. Customers can opt to have the WWS emailed directly to them.





Pilot Program Rollout

Step 1: Determine the target audience and identify characteristics such as use pattern or property size.

Step 2: Explain the pilot study to the target audience and solicit volunteers.

Step 3: Randomly select which participants will get the conservation treatment and which will be part of the control group from everyone who opted in.

Step 4: Compare water use between the treatment and control group to determine if any savings were achieved.

What's Next for Watershed Approach to Landscaping?

- Emphasize customer success stories of landscape transformations to promote the WaterSmart Gardening Resource Center.
- Increase enrollment in Weekly Watering Schedule notifications to assist customers with understanding efficient irrigation practices.
- Develop resources with local and regional partners to provide locally appropriate landscape templates.

FINDING THE NEXT SAVINGS: PILOT PROGRAMS

Whenever possible, new programs are first implemented as pilot programs to evaluate their feasibility and effectiveness, identify potential challenges, gather feedback, and make necessary adjustments. Exploring innovative pilot programs to tap into new savings and determine if they should be fully integrated rebate programs is a valuable first step to launching a new program. Below are sample pilot projects under consideration, which will be tested and evaluated before being fully integrated programs in the future.

Commercial Water Conservation

Enhancing water use efficiency among commercial customers will be an important focus for the District over the next few years. Having a custom rebate to support commercial customers beyond current rebate offerings will be critical to achieving the District's overall water use reduction target.

Informational Residential Water Budgets

As part of this Informational Residential Water Budgets pilot program, the District would develop customized water budgets for residential large landscapes. The outdoor water budget could be calculated using three factors: irrigated landscape area, localized weather data, and landscape factor reflecting the specific amount of irrigation water required by the types of plants in the yard. The District would provide bi-monthly tracking of actual water use compared to budgeted use.

Landscape Efficiency Improvements for Municipal Customers

Municipal-owned landscapes often lack the funding, expertise, and time necessary to make water-saving improvements. A pilot program to launch a sports field efficiency program, coupled with the turf rebate program to reduce non-functional turf, would provide adequate assistance to municipal customers resulting in both water savings and park improvements.



POLICIES TO ENSURE HOMES MAXIMIZE EFFICIENCY

Local policies and regulations that go beyond State requirements can further drive long-term water efficiency within the service area while limiting the impact on current customers. There are current policies in place, considerations for policy revisions, and new policy considerations. Marin Water staff actively works with customers to ensure new homes maximize efficiency.

Landscape Plan Review

To assist cities within the District’s service area comply with MWELo requirements, Marin Water has developed water conservation requirements for landscape professionals and homeowners when designing and installing landscapes and irrigation systems to ensure water use efficiency. Marin Water recommends that all residential and business customers developing a project with landscaping or irrigation changes contact the District before the project’s design phase. Marin Water’s current Landscape Plan Review requirements are more stringent than California’s MWELo requirements. Therefore, on behalf of the cities and towns within the District’s service area, Marin Water works with customers to complete the Landscape Plan Review requirements to ensure that all State and local requirements are met. As water conservation efforts and irrigation management practices evolve, the District will continue developing programs and policies that recognize new practices and technologies that result in the efficient use of water. From 2020 to 2023, 331 residential sites have gone through Landscape Plan Review.

Water Efficient Fixtures

The District requires that all interior plumbing installed, replaced, or moved in any new or existing service be high-efficiency fixtures. Previously, the District code for interior plumbing fixtures stood as one of the most forward-thinking in the State. However, with the advancement the State’s CALGreen Building standards, the District’s regulations have become outdated. As all the local jurisdictions are required to enforce CALGreen standards, there exists a need to update the District code to align with the State regulations, ensuring that the updated standards continue driving efficiency in the region.

To support customers in achieving maximum efficiency both indoors and outdoors, Marin Water offers free water-efficient fixtures including:

- Hose shutoff nozzles to reduce flow rates and automatically shut off garden hoses
- Faucet aerators to reduce the amount of water coming from faucets
- Shower timers to help keep showers to 5 minutes or shorter
- Showerheads
- Leak detection dye tablets to spot toilets leaks.

Graywater Ordinance

Since 2015, all new water service and enlarged water service for substantial residential or commercial remodels are required to install a graywater recycling system to reuse the maximum practicable amount of graywater on site. The administrative process allowed customers to self-certify if their

site was “not-feasible” for a graywater system, resulting in 90% of eligible service connections being declared exempt from installation requirements. Comments from customers included issues with the use of graywater on their property, maintenance of the system, and system cost. In November 2022, the administrative process was changed to require documentation for “not-feasible” sites, resulting in a reduction of these sites from 90% to 35% by the end of 2023. A graywater stub-out option was incorporated in this change to address customer feedback regarding use, maintenance, and cost concerns.

What’s Next for Maximizing Efficiency in Homes?

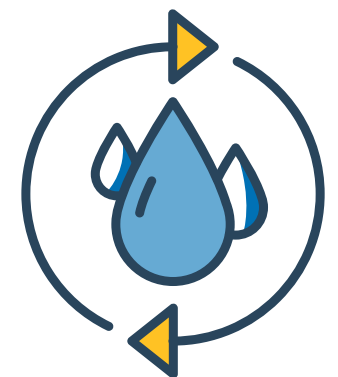
Evaluating the success and challenges of local regulations is necessary to ensure Marin Water has reasonable rules and expectations for water users. **Appendix C** provides the detailed changes proposed below.

- **Graywater Regulation.** The graywater regulation is not effective in reducing outdoor water use for new homes, as intended. While the stub-out option is a temporary solution, there are no water savings achieved from this installation. To ensure new homes maximize outdoor water efficiency, a proposal to eliminate the graywater requirement from the code has been developed.
- **Water Efficient Fixtures.** The current code is outdated, and the State’s CalGreen Fixture Standards are updated every three years to align with the latest technology. To minimize confusion, the District fixture standards should be repealed.



Marin Water is continuously seeking opportunities to push the envelope on water use efficiency. In addition to offering programs aimed at assisting customers in improving water use efficiency in their homes, Marin Water is also investigating new ordinances that the District may pursue in the future to further advance water use efficiency. Examples of potential future ordinances include:

- **Hot Water Recirculation.** The District would develop code mandating applicants for new water service and those implementing significant renovations to implement a hot water recirculation system into their plumbing infrastructure. This ordinance would also require the accurate sizing of pipes to minimize wait times for hot water.
- **Retrofit Upon Resale.** The District would develop code requiring all existing residential buildings, at the time of change of ownership, be retrofitted, if not already so, exclusively with high-efficiency water-use plumbing fixtures.
- **New Non-Functional Turf Area Limits.** The District would update the code to limit, or ban, the future installation of non-functional turf areas in single-family residential and duplex sites.
- **Water Efficient Home Certification Program.** The District would implement a certification program to recognize homes as water efficient.



4 WATER EDUCATION IS A TEAM EFFORT.....

Water education is a team effort that requires dedicated staff and collaboration with local entities to provide consistent and high-quality information and resources. Over the past few years, Marin Water has spearheaded a comprehensive water use efficiency initiative encompassing a broad mix of educational programs to promote using water wisely.

EDUCATION INITIATIVES

To increase community awareness of water-saving opportunities, Marin Water provides resources and support using various strategies.

Eco-Friendly Garden Tour

In coordination with the Sonoma-Marín Saving Water Partnership (SMSWP), Marin Water participates in the Eco-Friendly Garden Tour each May when customers are thinking about gardening and landscapes are in full bloom. The 1-day Eco-Friendly Garden Tour allows customers to visit private gardens featuring sustainable landscaping practices and highlights inspiring gardens throughout Sonoma and Marin counties.

Water Waste Report Program

In an effort to reduce water waste, the general public can report a leak or other water waste activity to Marin Water online or over the phone. These contacts are logged into a database and followed up on by field staff to investigate and notify properties about water waste situations. All information is kept confidential. These interactions are an opportunity to educate customers on the District Water Waste Regulations, included in **Appendix D**.

Watershed Approach to Landscaping (WAL) Garden Grant

WAL Garden Grant is available to community organizations for creating publicly accessible garden projects that demonstrate sustainable gardening techniques and water efficiency principles. The purpose of the WAL Garden Grant program is to support local community-based efforts in educating the public about California native and/or climate appropriate plants that can be successfully used in waterwise urban landscapes. Educational gardens showcase plants and sustainable gardening techniques appropriate to the local climate and provide learning opportunities for home gardeners on design, planting, and maintenance practices. They are open to the public and free of charge. Since 2021, three grants have been issued for gardens at the Central Marin Police Station, Dominican University, and Homestead Valley Home Owners Association.

SCHOOL EDUCATION PROGRAM

Marin Water offers free water education programs for schools in the service area. The School Education Program is a comprehensive approach to helping educators teach students the “value” of water as an important natural resource. Water and energy conservation and stewardship of local watersheds are promoted throughout the program. Students are encouraged to use water wisely and make environmentally sustainable choices to help secure a reliable source of freshwater now and in the future. More than 111,000 students were reached from 2007 to 2020, and an additional 15,500 students were reached from 2020 to 2023.

School Education Program Offerings:

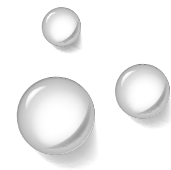
- **Water Conservation Walk** - A walking tour of the Mt. Tamalpais Watershed and learn about ecology, water supply and water conservation. This field trip is designed to teach students about the source and use of their water while inspiring them to take action to conserve this precious resource.
- **Classroom Presentations** - Fun and informative grade-appropriate classroom presentations to teach 3rd-12th grade students about the water cycle, our local water supply, watershed ecology and water conservation.
- **Science, Technology, Engineering and Math (STEM) Aligned Curriculum** - Students develop core STEM skills through reading their home or school’s utility meters, synthesizing and interpreting consumption data, and testing real-world solutions to save water and energy.

What’s Next for the School Education Program?

While Marin Water has received positive feedback from teachers attending field trips and classroom presentations, there is more that Marin Water can do to demonstrate how participation in School Education Program aligns with California’s Next Generation Science Standards. The School Education Program will be evaluated to determine if changes are needed. Once complete, a schedule for the revisions will be established, and new marketing and outreach materials will be developed to promote the value of the School Education Program in alignment with the Next Generation Science Standards.



BUILDING PARTNERSHIPS



Regional collaboration is critical for mitigating and addressing threats related to climate change and ensuring water resources are used efficiently. Over the past few years, Marin Water has developed partnerships with local agencies, businesses, and other organizations to leverage expertise and resources to address these challenges.

Local Jurisdictions

Marin Water's 11 local jurisdictions are key partners for promoting water efficiency, complying with State regulations, and coordinating on multi-benefit initiatives. Partnerships with local jurisdictions will continue to be an important part of the District's water use efficiency programs.



Marin Energy & Climate Partnership

Founded in 2007, the Marin Energy & Climate Partnership (MECP) is a partnership of the 11 Marin cities and towns, the County of Marin, and public agencies that serve Marin, including Marin Water. The mission of the MECP is to create a countywide partnership that allows partner members to work collaboratively, share resources, and secure funding to: (1) discuss, study and implement overarching policies and programs, ranging from emission reduction strategies to adaptation, contained in each agency's Climate Action Plan; and (2) collect data and report on progress in meeting each partner member's individual greenhouse gas emission targets. MECP works together to reduce greenhouse gas emissions in government operations and in Marin communities.



Resilient Neighborhoods

Resilient Neighborhoods leads free online workshops to help Marin County residents reduce their carbon footprint and work together to increase their emergency preparedness. Participants are equipped with the resources and support to achieve short and long-term climate action and sustainability goals. Marin Water partnered with Resilient Neighborhoods to form Climate Action Teams in local communities.



Marin County Stormwater Pollution Prevention Program

Marin County Stormwater Pollution Prevention Program (MCSTOPPP) is a collaboration of Marin County and its 11 cities and towns working together to protect the creeks, rivers, and bays across the North Bay since 1993. MCSTOPPP provides stormwater resources for businesses, residents, contractors, developers, creek projects and permitting, students and teachers, and more. Marin Water partnered with MCSTOPPP to promote the benefits of water-efficient and stormwater-friendly landscaping.



MCE Community Choice Energy

MCE is a renewable energy provider based in Marin County. Marin Water has collaborated with MCE to expand the School Education Program to include energy efficiency. MCE and Marin Water have a cost-sharing agreement for Zun-Zun, an interactive school assembly program.



Sonoma-Marín Saving Water Partnership

The SMSWP is a regional partnership formed in 2010 to facilitate regional collaboration amongst the water retailers served by SCWA. The SMSWP pursues grant funding on behalf of its members and facilitates regional targeted campaigns, such as the Water-Smart Plant Label Program for local plant nurseries.



Marin Master Gardeners

Marin Garden Walks are conducted by Marin Master Gardeners to provide homeowners with information and advice on improving their irrigation practices to help conserve water resources. The site visit focuses on water efficiency, irrigation systems, soil health, landscape maintenance, and of course, leak detection. Since the program's inception over a decade ago, 1,000's of Garden Walks have been performed bringing local expertise to local landscapes.



College of Marin offers a series of classes based on Marin Water's Watershed Approach to Landscaping philosophy to engage the public in current conservation practices and assist home gardeners in the step-by-step process of creating their own beautiful, environmentally sensitive, waterwise landscapes. The Watershed Approach to Landscaping booklet, published by Marin Water, serves as the textbook for this program and is provided to students at no additional cost. From 2020 to 2023, 400 participants attended the training.



The Urban Farmer Store

Marin Water partnered with The Urban Farmer Store for managing and delivering the Graywater Discount program to customers. Additionally, The Urban Farmer Store offers free Laundry-to-Landscape greywater webinars to teach customers how to design, install, and maintain a residential greywater system to divert water from washing machines to gardens.



Sloat Garden Center

Sloat Garden Center offers a wide selection of locally appropriate, low-water use plants, garden tools, soils, and garden expertise by knowledgeable nursery professionals. In partnership with Marin Water and the Master Gardeners, the Sloat Garden Center offers free landscape webinars on resilient, fire-safe landscaping and more. Sloat is a local participant in the Water Smart Plant Labeling Program which helps customers select locally appropriate, low-water-use plant material.



COMMUNITY OUTREACH

Getting the Word Out

Through its outreach work, Marin Water aims to increase customer participation in District offered water efficiency programs and services, while also increasing general awareness of the importance of using water wisely whether in times of drought or plentiful rain years. To accomplish this, Marin Water takes a thoughtful approach to developing content and collateral that is tailored to the local community, and also deploys a range of strategies for distribution of its collateral, applying attention to the timing and delivery mechanisms that are used. The following primary tools are used for disseminating outreach to customers.

Monthly e-News

A monthly digital newsletter distributed to nearly 20,000 subscribers covering a range of Marin Water news and updates. Each month, the District features one or more water efficiency programs or services to highlight through a unique promotional update. Since its inception in 2022, the District's e-News has averaged higher than a 55% monthly open rate amongst its subscribers.

Bill Inserts

The District places outreach pieces in each customer bi-monthly bill for a total of at least six inserts per year per customer. Each insert highlights water efficiency rebates, incentives or other water-saving tips and inspiration that customers can apply to their own household or business.

Local Community Events

Each year, Marin Water attends a range of community events ranging in size from larger city or town-wide events to smaller, more intimate neighborhood-centric gatherings. By participating in a diverse range of events, staff are able to connect with a wide array of customers throughout the service area to distribute program information, water efficiency fixtures and other resources.

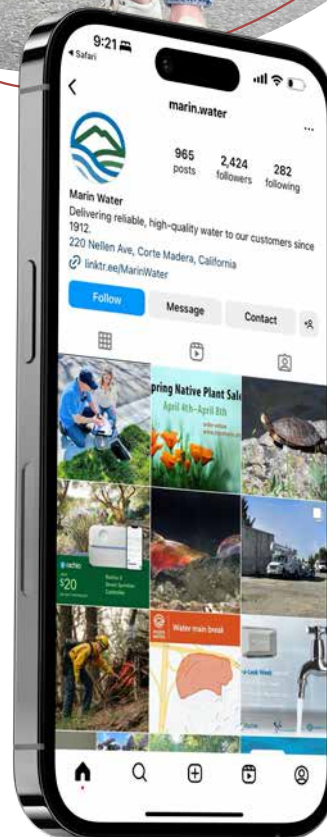


Point-of-Service Outreach Displays

Marin Water leverages its public counter space at its Administrative Service building to disseminate signboard messaging, water efficiency fixtures, and resource literature about its various programs. Customers that access Marin Water facilities for transactional needs, such as paying their water bill, are able to conveniently connect with and collect these resources at the point of service.

Social Media

Marin Water utilizes Facebook, Twitter, Instagram, and NextDoor for disseminating messaging around water efficiency programs and services. A yearlong editorial calendar is used to help plan, develop and deploy messaging that is appropriately timed to seasonal weather changes and broader regional campaigns.



News Media

Marin Water utilizes relationships with its media contacts, when appropriate, to proactively pitch water efficiency focused news stories. A few examples of past successful efforts include an on-camera Marin Water Conservation Assistance Program appointment inside the home of a member of the broadcast media, an on-camera staff member demo of how an AMI metering system works, a feature home and garden print story highlighting a successful Cash for Grass program participant's landscape transformation.

Paid Advertising

Marin Water uses a range of paid local advertising opportunities to promote its water efficiency programs and services, including in digital and print local newspapers and magazines, PSAs on local radio stations, and sign boards in public spaces.

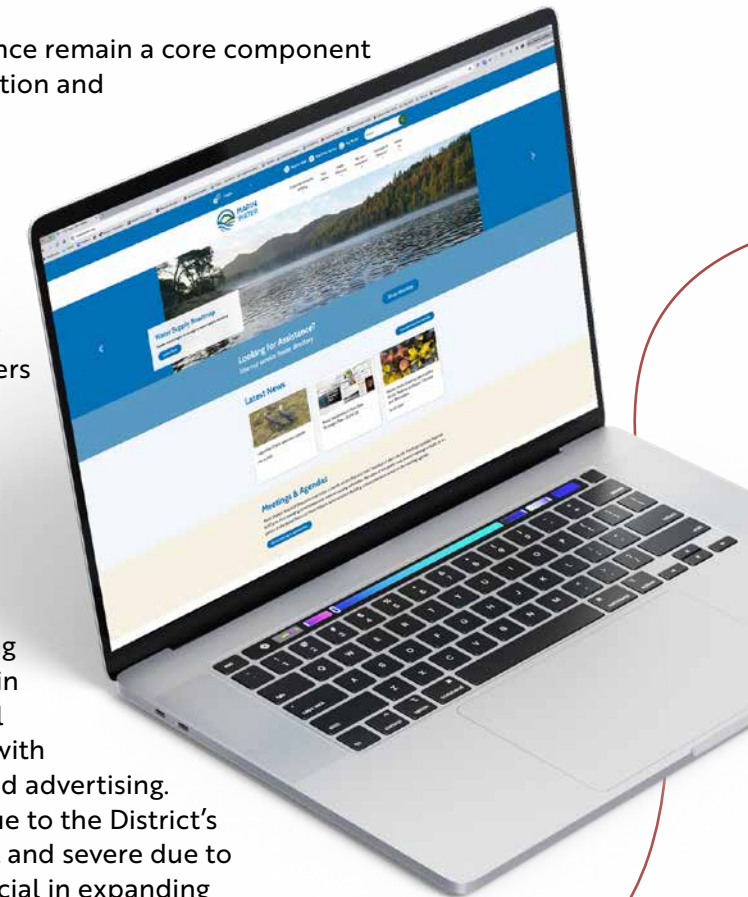
Ensuring a Quality Website Experience for the Customer

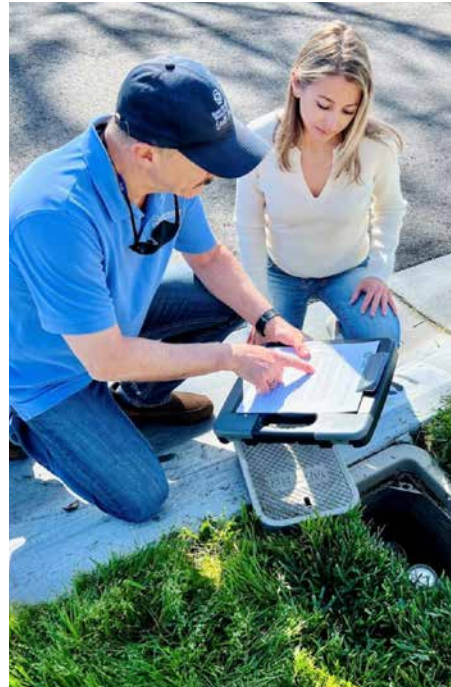
A strong website can make or break program participation and a customer's ability to find and utilize available resources. In the last few years, Marin Water has taken significant steps to improve and enhance the presence and navigation of its water efficiency program information, giving this content greater prominence on the District's homepage, and improved organization throughout its interior program pages.

Ongoing improvements to the online customer experience remain a core component of Marin Water's outreach work to ensure ease of navigation and low-barrier access to all of its available water efficiency programs, services and resources.

Crisis Communications in Times of Water Shortages

Marin Water also maintains community outreach during drought or water shortage emergencies to help customers reduce water use quickly. In 2020 and 2021, the District experienced the worst drought on record following two very dry consecutive years that resulted in historically low reservoir storage levels. Marin Water's Board of Directors declared a water shortage emergency and adopted mandatory water use restrictions to preserve water supply. As a result, Marin Water launched a comprehensive outreach campaign that included providing ongoing social media updates, developing and distributing materials to gyms, hotels, restaurants and other local establishments, hosting community events, partnering with community organizations, and conducting extensive paid advertising. Water use decreased by 30% between 2020 and 2022 due to the District's accelerated efforts. As droughts become more frequent and severe due to climate change, outreach efforts will continue to be crucial in expanding participation in water use efficiency activities in the future.





Gauging Customer Awareness and Preferences

Understanding the Marin Water customer is key to shaping effective outreach campaigns. Marin Water uses a number of measurement points to monitor successful outreach campaigns and areas where improvements or adjustments in strategy may be needed. Monitoring the overall number of program participants, tracking digital engagement analytics on outreach platforms, and receiving anecdotal customer testimonials are a few ways the District track what types of outreach resonates with its customers. Additionally, Marin Water has relied on more statistically significant data from periodic, random-selection customer surveying to help gather a broader sense of where customers' level of program awareness and general communication preferences land. Marin Water's most recent survey was conducted in 2023 and the previous one was conducted in 2018.

For the 2023 customer survey, Marin Water contracted with research and opinion firm FM3 to conduct a survey of residential customers to gauge their awareness and opinions regarding several District focus areas. Those focus areas are listed below and the areas that tied

directly to the District's water efficiency programs and related outreach work are **bolded**.

- Overall impressions of Marin Water
- **Views and awareness of water efficiency programs, including motivations for saving water**
- Experiences with Customer Service
- **Preferences for District Communications/Outreach**

The survey targeted Marin Water's single-family and duplex residential customers and was conducted July 26-31, 2023 using phone call and online surveying methods. A total of 415 responses were collected and the following conclusions were developed from those collected responses:

- Customers highly value using water efficiently.
 - Three in four say reducing water usage is extremely or very important.
 - Almost all customers say they have taken steps to reduce their water usage.
 - A majority say they do not need help reducing their water use. But two in five say they could use help finding ways to reduce water use.
 - Protecting water supply and preparing for future droughts are the major reasons customers would reduce water use.
 - Roughly one-quarter of customers say they've used one of Marin Water's programs; many are unfamiliar with a number of the incentives available.
 - The Cash for Grass rebate program has some of the highest awareness of all incentive and rebate programs even though few customers surveyed say they've used it.
- Respondents also found communications from Marin Water helpful and most preferred e-newsletters sent to their inbox and inserts in their mailed water bills as their preferred forms of communication.

These survey conclusions – along with ongoing customer input, digital analytics, and program participation levels – contribute to informing and guiding Marin Water's outreach strategies. A summary of the 2023 Customer Survey is included as **Appendix E**.

What's Next for Community Outreach?

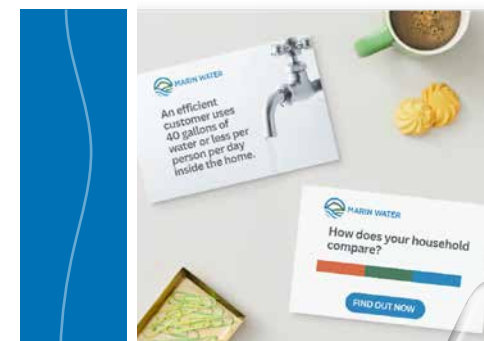
Through its most recent customer survey, Marin Water knows that the community understands the importance of using water wisely and is motivated by preserving our supply in the face of climate uncertainty. The District also sees strong customer use around some of its ongoing, signature communication tools, including bill inserts and the monthly e-newsletter, but the data shows that opportunity remains to find ways to reach some customers who may not be getting District communications and who are unfamiliar with water efficiency programs available to assist them, particularly rebates and incentives.

More recent customer input and questions that followed a July 2023 four-year rate increase, also demonstrated that there is some education needed to help residential customers understand what a water efficient household truly is in Marin Water's service area. Establishing comparison or baseline examples for customers would be useful in this regard, as it is difficult to influence behavior change, if a customer does not first recognize that there home may have room for improvement.

The District also recognizes that there are still some customers who are open to assistance in reducing their water use; however, it is a minority of customers that want this assistance. As a result, the District plans to take a more focused and narrowed approach to target outreach efforts to the District's higher water users, especially focusing on outdoor water use.

To carry out actions based on these findings and observations, the District will integrate the following key strategies into its outreach plans over the next several years:

- Develop compelling visuals and narrative for campaigns that help to underscore the idea that reducing water usage protects the community's existing water supply and better prepares everyone for future droughts.
- Continue broad outreach through existing channels, but also explore new opportunities to connect hard-to-reach customers with our programs by pursuing unique community partnerships and service-area wide advertising opportunities.
- Spotlight real-life success stories from customers who have taken advantage of Marin Water programs to inspire action from those who may be skeptical or on the fence about taking steps to convert their lawn, irrigation system, old appliances, etc.
- Use residential customer water usage data to develop outreach campaigns targeted to the District's higher water users.
- Use available detailed behavioral datasets –generated from ESRI Census information – which focus on consumer lifestyle and spending habits to help inform how to tailor advertising methods and campaign messaging to appeal to various targeted customer audiences.



5 PLAN EVALUATION: HOW DO WE EVALUATE AND MEASURE SAVINGS?.....

HAVE A PLAN AND FLEXIBILITY



The District’s water efficiency programs are ongoing, with programs outlined in advance to determine budget and resource needs. The water efficiency programs employ an adaptive management approach and can be adjusted periodically to account for real-time weather conditions, new opportunities, and customer trends. A specific program may be expanded if it is doing well or updated to increase customer participation or water savings.

MEASURING AND TRACKING SUCCESS

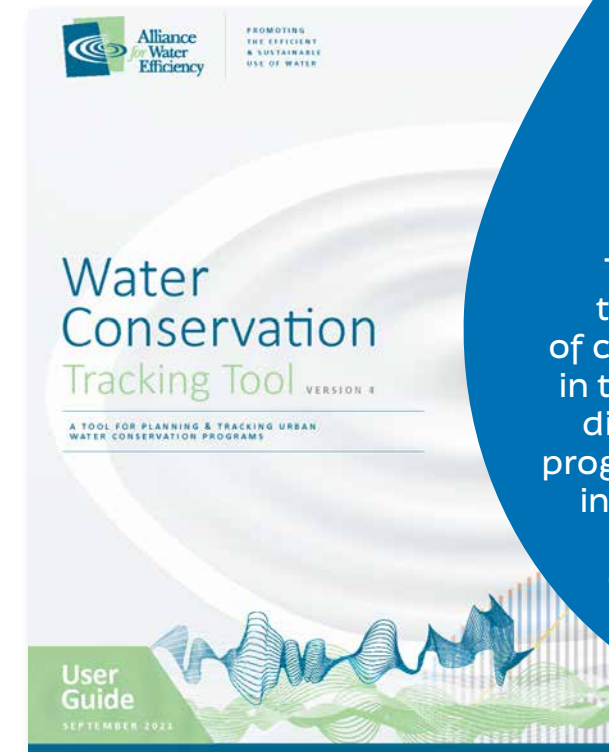
Establishing metrics to measure Marin Water’s success is necessary. While the District has historically compiled a summary report each year that shows how many customers participated in each program, there are additional metrics that help determine program success.

- Top-down analysis: This approach looks at broad water use patterns over time, such as GPCD, to determine if changes are occurring. The total GPCD should decrease over time to achieve the target reduction of 14 GPCD by 2045.
- Bottom-up analysis: This adds up the savings of individual customers who participated in water use efficiency programs to determine if net savings are on track to achieve a target reduction of 14 GPCD by 2045.
- Program participation: Marin Water continuously tracks participation in active programs. This allows the District to adjust outreach, if necessary.
- Water use efficiency market share: Marin Water analyzed participation and found that over 8% of all residential accounts participated in at least one water use efficiency program between 2020 to 2022. Of the accounts that participated, 28% participated in at least one other program. Marin Water’s goal is to expand water use efficiency and meaningfully interact with all new and existing customers.

- Water use efficiency education and outreach: Marin Water tracks how many customers participate in the education and outreach programs the District offers and the ones its partners offer.
- Digital outreach: Marin Water tracks digital engagement each month through available platform analytics tools as follows:
 - Website – the District tracks our top visited pages, the time spent on those pages, and how users arrived there.
 - Social media – the District tracks our impressions, top performing posts on each platform, and level of engagement on all posts.
 - Monthly e-newsletter – the District tracks our subscriber open and click-through rates, and top clicked articles, and conversion on promotional articles that lead to online sign-ups/participation.

WHERE DO WE GET SAVINGS ESTIMATE

Savings estimates can be calculated using the AWE Water Conservation Tracking Tool based on program participation levels and an assumed water savings factor for each incentive. Appendix A provides the detailed model assumptions and projections analyzed for development of the 2045 goals. Marin Water uses water savings factors included in current models and literature to estimate savings. It is important to note that the water savings factors may or may not accurately capture the exact ways that customers in a specific area or region use water. To validate these factors, the estimated savings can be tested against actual savings achieved by conducting an in-depth program evaluation, such as a “Difference in Difference Method.” Because actual program evaluation is a rigorous and time-consuming process, Marin Water has completed an in-depth savings analysis on selected programs, but does not complete a full actual savings analysis on each program every year. Marin Water’s goal is to periodically select key programs for detailed analyses to inform the factors used to calculate water savings.



Estimating Actual Water Savings: Difference in Difference Method

The analysis compares the change in water use of customers who participate in the program to those who did not participate in the program to assess the impact, in terms of water savings, of the specific water conservation program.



6 OPERATIONS SIDE CONSERVATION: WATER LOSS CONTROL AND LEAK DETECTION

The District is confronted with a distinct set of challenges due to its rich history and complex infrastructure. Despite these challenges, Marin Water is committed to leveraging technology, data analysis, and expertise to develop a robust water loss control program. Demonstrating to our customers that we too have an opportunity to do more to reduce water waste.

WHAT IS A WATER LOSS AUDIT AND WATER LOSS CONTROL PROGRAM?

Real losses are physical losses of water due to leakage or pipe breaks, while **apparent losses** are losses attributed to factors such as meter inaccuracies, unauthorized consumption, and billing errors.

Water loss control involves acquiring distribution system data, conducting inventory and audits, risk modeling, assessing conditions, tracking losses, maintaining infrastructure, and detecting and repairing leaks for water utilities. Leak detection and repair are common water agency practices, but true water loss control is more extensive. Auditing a water distribution system for real and apparent losses and evaluating the costs of those losses is the foundation of water loss control. These practices offer the potential to conserve significant volumes of treated water by reducing real losses and increase revenue by reducing apparent losses.

The District performs annual water loss audits in accordance with CWC §10608.34 as described in the Water Loss Standard section. These audits are prepared using the AWWA Free Water Audit Software version 6.0 and validated by an AWWA California-Nevada Section-Certified California Water Audit validator prior to submission to DWR.

The District's current real water loss is a testament to its commitment to reducing water loss. The District's real water loss is 19.7 gallons per connection per day, which is approximately 30% less than the Individual System Water Loss Standard set by the State Water Board for the District as described in the Water Loss Standard section.

WATER LOSS CHALLENGES UNIQUE TO MARIN WATER

Chartered in 1912, Marin Water is California's first and oldest municipal water district resulting in a complex water system that presents Marin Water with numerous unique challenges.

- There are three water treatment plants, almost 900 miles of potable water pipes, 89 pump stations, more than 130 storage tanks, and more than 62,600 meters to maintain in the water system.
- Water is distributed across 144 distinct pressure zones. Elevated pressures and sudden changes in pressure may strain infrastructure, making it vulnerable to leaks or breaks.

- Areas of Marin Water's system are over 100 years in age. Aging infrastructure is often prone to leaks or breaks.
- Marin Water has water infrastructure of varied materials and construction types, including welded steel, high-density polyethylene (HDPE), and cast iron.

The District is working to leverage a wide array of technology, data analysis and expertise to effectively address these challenges. Marin Water is actively developing an informed and cost-justified water loss program, marking it as a strategic priority.

WATER LOSS CONTROL TRACKING

Most leaks, approximately 90%, are reported by the public, with the remainder found through Marin Water's internal proactive leak detection efforts. When a leak is reported or found, staff prioritizes response based on the impact to providing a reliable service. Each leak is classified into a three-class system and prioritized and scheduled by a field supervisor:

- Class I - access to drinking water is impacted and a mainline must be shut off. The leak will be prioritized and responded to immediately.
- Class II - service is not impacted because of the leak. The leak will be managed based on available resources.
- Class III - the leak is very minor and water loss is estimated to be low. The leak will generally be repaired within 2 to 3 weeks depending on other priorities.

2021-2023 Systemwide Leak Tracking

	CLASS 1	CLASS 2	CLASS 3	TOTAL
2021	145	26	217	388
2022	190	36	236	462
2023	164	30	151	345

Staff documents each leak and leak repair, including the type of leak, pipe material, facility type, estimated volume of water lost, and other site attributes. All repairs are managed with in-house personnel, and once the repair is completed, the crew lead completes a sketch of the repair remedy documenting the necessary steps and materials used in the repair. These repair notes are later transferred back into the geographic information system (GIS).

The proactive leak detection survey covered 619 miles (71%) of pipeline from 2021 through 2023, detecting 122 leaks that would not otherwise have been discovered until they surfaced.

Water loss reporting from 2020 to 2022 averaged 1,377 acre-feet (AF) in real losses and 764 AF in apparent losses. Benchmarking the current status over the last three years allows for tracking improvements as they are initiated to reduce overall system loss.





THE FUTURE OF WATER LOSS CONTROL PROGRAM

A gap assessment is underway with the intention to improve the accuracy of inputs in the State-required annual water loss audit, understand the current extent of water loss control activities and practices within the various District departments, and highlight areas for additional water loss recovery efforts through technology.

Marin Water is interested in understanding how new leakage recovery techniques can be used to supplement the current water loss control program activities. A list of primary leakage management technologies for the District to consider has been developed. These strategies are being evaluated and considered for piloting.

7 LOOKING FORWARD

Marin Water is constantly looking for new and exciting opportunities to achieve the established water use efficiency goals. To that end, Marin Water has identified strategies throughout this Plan to broaden participation through targeted outreach and marketing and to increase associated water savings. Through the adoption of advanced technologies, support of current and future State regulations that drive water use efficiency, ongoing evaluation and expansion of program offerings, and education and targeted community outreach, Marin Water aims to not only maximize water savings but also ensure broader community participation. The District's commitment to achieving the water use efficiency goals will ensure the sustainable management of natural resources and build a more resilient future for communities.





Appendices

Five-Year Water Efficiency Master Plan

Marin Municipal Water District



Appendix A

Savings Potential Technical Memorandum

1 BACKGROUND AND INTRODUCTION

Marin Municipal Water District (Marin Water or District) has prepared the Five-Year Water Efficiency Master Plan (WEMP) to present strategies for advancing water conservation in the Marin Water service area. This Appendix supports the WEMP by evaluating Marin Water's existing water efficiency programs, analyzing potential new conservation measures, and assessing the remaining potential for water conservation by evaluating three different conservation portfolios.

This Appendix describes the analysis and methodology used to estimate the range in conservation potential, the conservation measure assumptions, and the conservation portfolios developed to determine the conservation saving potential of 4,160 acre-feet per year (AFY) by 2045, as presented in the WEMP. The existing and potential new water conservation measures were analyzed using the Alliance for Water Efficiency Conservation Tracking Tool (AWE Model).

This Appendix includes the following sections:

Section 1: Provides background on the WEMP and identifies the purpose for the analysis presented in this Appendix.

Section 2: Describes the methodology used to determine the range in conservation potential analyzed for Marin Water.

Section 3: Provides a summary of the conservation measures analyzed, including the savings assumptions, costs, and implementation rates.

Section 4: Presents the three conservation portfolios analyzed and the combination of measures and implementation rates considered in each portfolio.

Section 5: Summarizes the outcome of the analysis and the model results.

Section 6: Presents screenshots of the AWE Model inputs.

2 RANGE IN CONSERVATION POTENTIAL

In order for Marin Water to gauge the possible savings available to the District, a range in conservation potential was analyzed to compare the achievable, realistic, and/or ambitious conservation potential. The range in conservation potential is described and quantified below and is shown in **Figure 1**.

2.1 Theoretical Ceiling Conservation Potential

This potential represents the water savings that could be achieved if all customers were instantaneously at the most theoretically efficient levels of water usage. This potential is unattainable given that no system is ever 100% efficient. While unachievable, this Theoretical Ceiling does help by setting a reference point for other conservation potentials analyzed. The Theoretical Ceiling conservation potential is calculated as the sum of the calculated potential savings from the single family residential (SFR) customer sector and the other remaining customer sectors.

The future SFR water demand at the Theoretical Ceiling is calculated as the sum of the median indoor water use demand and half of the median outdoor water use demand from the 2022 Flume data provided by the District (Marin Water, 2023a). Specifically, this amounts to 73 gallons per day (GPD) for indoor use and 24 GPD for outdoor use, resulting in a total of 97 GPD per household. This approach assumes the effective prohibition of all non-functional turf and full saturation of water efficient landscaping. The water savings will come from the existing SFR accounts in 2022, with the assumption that new development will achieve maximum efficiency.

The 2022 SFR demand is 11,648 AFY from the account-level consumption data (Marin Water, 2023a), and the number of SFR accounts is 51,675. By multiplying the 97 GPD per household by the number of SFR households (51,675), the future SFR demand would be about 5,607 AFY. The SFR savings potential is calculated as the difference between the 2022 SFR demand (11,648 AFY) and the future SFR water demand at the Theoretical Ceiling (5,607 AFY), which is **6,041 AFY**.

If the 2022 SFR demand were to be reduced to the level described above, it would represent a reduction of approximately 52% from the original demand. Based on the observed drought response patterns, it is assumed that other sectors could achieve a 25% reduction from the 2022 demand, which is roughly half of the savings achieved in the SFR sector. The multi-family residential (MFR), commercial, industrial, and institutional (CII), and irrigation/landscape demand in 2022 was 7,421 AFY, and 25% of that demand would be **1,855 AFY**.

Therefore, the Theoretical Ceiling conservation potential is estimated to be **7,896 AFY**.

2.2 Technical Maximum Conservation Potential

This potential represents additional savings from outdoor use remaining at drought response levels, saturation of efficient fixtures, and all new development at maximum efficiency. This level of conservation is achievable by going beyond voluntary customer participation and mandating efficiency through stricter codes, ordinances, and enforcement. This level of conservation potential is logistically unenforceable. The Technical Maximum conservation potential is calculated as the sum of the calculated potential savings from the single family residential (SFR) customer sector and the other remaining customer sectors.

Taking into account the limitations in achieving the Theoretical Ceiling, the Technical Maximum is based on the median water use demand from the 2022 Flume Data provided by the District (Marin Water, 2023b), specifically 132 GPD per household. The water savings will come from the existing SFR accounts in 2022, with the assumption that new development will come online at maximum efficiency.

This approach is considered a reasonable approximation of Technical Maximum because: (1) the drought reduction by SFR was 29% per summer water use from 2020 to 2021, and no drought rebound occurred in 2022. This approach assumes no rebound in the outdoor water demand, which would require continued aggressive conservation actions, and (2) the District's indoor gallons per capita per day (GPCD) is already highly efficient and is significantly lower than the proposed State target of 42 indoor GPCD.

The 2022 SFR demand is 11,648 AFY from the account-level consumption data (Marin Water, 2023a), and the number of SFR accounts is 51,675. By multiplying the 132 GPD per household by the number of SFR households (51,675), the future SFR demand would be about 7,633 AFY. The SFR savings potential is calculated as the difference between the 2022 SFR demand (11,648 AFY) and the future SFR water demand at the Technical Maximum (7,633 AFY), which is **4,015 AFY**.

If the 2022 SFR demand were to be reduced to the level described above, it would represent a reduction of approximately 34% from the original demand. Based on the observed drought response patterns, it is assumed that other sectors could achieve a 15% reduction from the 2022 demand, which is roughly half of the savings achieved in the SFR sector. The MFR, CII, and irrigation/landscape demand in 2022 was 7,421 AFY, and 15% of that demand would be **1,113 AFY**.

Therefore, the Technical Maximum conservation potential is estimated to be **5,128 AFY**.

2.3 Passive Program Conservation Potential

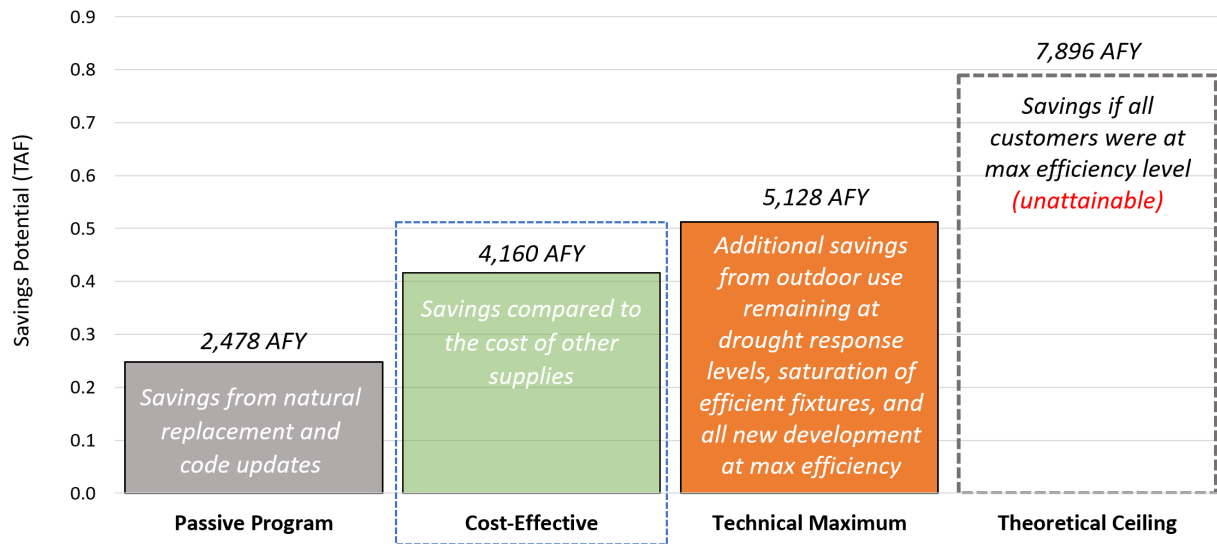
This potential represents savings from natural replacement and code updates. This level of conservation is achievable with programs aimed at implementing current plumbing codes and landscape ordinances, public messaging and outreach, and maintaining behavior-change savings from past customer efforts. The passive program conservation potential is estimated at 2,478 AFY per the AWE model.

2.4 Cost-Effective Conservation Potential

This potential represents savings compared to the cost of alternative supplies. This level of conservation is achievable through implementation of conservation programs determined to be cost-effective to Water, although it would require expanding current financial incentives to increase customer participation beyond current levels.

Marin Water chose to evaluate the remaining conservation savings potential through 2045 using a balanced approach – not setting the target too low by solely looking at passive savings (Passive Program conservation potential), but also not setting the target unattainably high (Technical Maximum conservation potential). With this approach, Marin Water calculated the Cost-Effective conservation potential by evaluating existing and potential new conservation measures (discussed in more detail in Section 3) and different conservation portfolios (discussed in more detail in Section 4) to estimate that Marin Water can achieve approximately 4,160 AFY of additional water savings by implementing incentives, additional customer support programs, and innovative pilot projects through 2045. This includes approximately 2,480 AFY in passive savings and approximately 1,680 AFY in active savings.

Figure 1. Range in Conservation Potential for Marin Water



3 MEASURES ANALYZED

Marin Water examined both (1) existing conservation measures already implemented, and that Marin Water plans to continue, and (2) potential new measures used by contemporary water agencies that Marin Water plans to implement from 2025 to 2045. **Table 1** and **Table 3** below document the associated customer sector, savings assumption, customer costs, and District costs for the existing measures and potential new measures analyzed, respectively.

3.1 Savings Assumptions, Customer Costs, and District Costs

The savings assumptions, customer costs, and District costs for the existing conservation measures are per (1) water use data for the existing programs, (2) information and data used in Marin Water’s Final Draft Strategic Water Supply Assessment (SWSA; Marin Water, 2023bc), and (3) data and information used in Marin Water’s 2020 Urban Water Management Plan Water Demand Analysis and Water Conservation Measures Update (2020 Demand/Cons Report, EKI, 2020).

To estimate costs and savings for the potential new programs for which District-specific data is not available, references from other water agencies were used. These references include (1) the Bay Area Water Supply and Conservation Agency’s (BAWSCA’s) Annual Water Conservation Report for Fiscal Year (FY) 2020 – 2021 (BAWCA, 2023), (2) the Alameda County Water District’s (ACWSD’s) Leak Repair Program (ACWD, 2023), and (3) the City of Petaluma’s Demand Management Decision Support System Model (DSS Model; City of Petaluma, 2019). Additionally, the SWSA data mentioned above was used to estimate some of the assumptions and costs for some of the potential new programs. More details on the costs and savings assumptions can be found in the “Notes” column in **Table 1** and **Table 3**.

3.2 Implementation Rates

Table 2 and **Table 4** below document the implementation rates assumed for both the existing and potential new conservation measures. Two implementation rates were analyzed: (1) the Baseline Implementation Rate, which represents a reasonable participation level based on historical participation rates, and (2) the Maximum Implementation Rate, which represents a feasible increase in participation levels for most measures beyond historical levels but would require significant District effort, including additional staffing and financial resources, to obtain.

For the existing measures, the two implementation rates are based on data from the District’s SWSA modeling and pre-drought and drought participation level data (Marin Water, 2023a). Since there are no historical participation levels to references for the potential new measures, the implementation rates are based on percentages of accounts based on similar programs. More details on the implementation rates can be found in the “Notes” column in **Table 2** and **Table 4**.

Table 1. Existing Conservation Measures Savings Assumption and Costs

Measures	Sector	Useful Life (years)	Implementation Rate Unit	Savings Assumption (gpy per Implementation Rate Unit)	Customer Costs per Implementation Rate Unit	District Costs (1) per Implementation Rate Unit	Notes
AMI Leak Notifications (2)	SFR	2	/ year	28,000	\$200	\$65	Useful life, savings assumption, and costs consistent with SWSA modeling.
Flume Direct Distribution	SFR	10	/ year	9,426	\$250	\$150	Useful life, savings assumption, and costs consistent with SWSA modeling.
High Efficiency Faucet Aerator / Showerhead Giveaway	SFR	15	/ year	4,013	\$50	\$40	Savings assumption and customer costs consistent with modeling done for Marin Water's 2020 Demand/Cons report. Utility costs and useful life consistent with SWSA modeling.
Laundry-to-Landscape Graywater Kits Rebate Program	SFR	10	rebate / year	4,413	\$2,000	\$162	Useful life, savings assumption, and costs consistent with SWSA modeling.
MFR Water Use Surveys	MFR	5	/ year	93,521	\$2,500	\$2,000	Useful life, savings assumption, and costs consistent with modeling done for Marin Water's 2020 Demand/Cons report.
Non-Residential Water Use Surveys	CII						
Non-Functional Turf Conversion Rebate Program	IRRI	23	sq ft / year	35	\$12	\$3.90	Useful life, savings assumption, and costs consistent with SWSA modeling.
Pool Cover Rebate Program	SFR	5	rebate / year	15,050	\$200	\$130	Useful life, savings assumption, and costs consistent with SWSA modeling.
Rain Barrel and Cistern Rebate Program	SFR	20	gal of storage / year	2	\$3	\$1	Useful life, savings assumption, and costs consistent with SWSA modeling.
Residential CAPs	SFR	5	/ year	6,273	No cost to customers	\$430	Useful life, savings assumption, and costs consistent with SWSA modeling and direction from Marin Water.
Smart Irrigation Controller Rebate Program - SFR	SFR	10	rebate / year	5,840	\$250	\$130	Useful life, savings assumption, and costs consistent with SWSA modeling.
Smart Irrigation Controller Rebate Program – Large Landscape	IRRI	10	rebate / year	32,704	\$569	\$1,422	Useful life and savings assumption consistent with SWSA modeling. Costs consistent with modeling done for Marin Water's 2020 Demand/Cons report.
Turf Conversion Rebate Program - SFR	SFR	23	sq ft / year	31	\$12	\$3.90	Useful life and costs consistent with SWSA modeling. Savings assumption per the City of Petaluma DSS Model.
Turf Conversion Rebate Program - CII	CII						

Notes:

- (1) Assumes a 30% markup to cover overhead costs.
- (2) For current AMI accounts.

Abbreviations:

AMI = Advanced Metering Infrastructure
CAP = Conservation Assistance Program
CII = Commercial, Industrial, Institutional

DSS = Demand Management Decision Support System Model
gal = gallon
gpy = gallons per year

IRRI = Irrigation
SFR = Single Family Residential
sq ft = square foot

SWSA = Strategic Water Supply Assessment
MFR = Multi-Family Residential

Table 2. Existing Measures Implementation Rates

Measures	Implementation Rate Unit	Baseline Implementation Rate	Maximum Implementation Rate	Notes
AMI Leak Notifications	/ year	1,250	1,250	Baseline and Maximum Implementation Rates consistent with SWSA modeling.
Flume Direct Distribution	/ year	500	600	Baseline Implementation Rate assumed equal to the pre-drought (1) annual average implementation rate. Maximum Implementation Rate assumed 20% more participation than Baseline Implementation Rate.
High Efficiency Faucet Aerator / Showerhead Giveaway	/ year	293	585	Baseline Implementation Rate assumed to be 25% of the drought (1) annual average implementation rate. Maximum Implementation Rate assumed to be 50% of drought annual average implementation rate.
Laundry-to-Landscape Graywater Kits Rebate Program	rebate / year	40	40	Baseline and Maximum Implementation Rates consistent with SWSA modeling.
MFR Water Use Surveys	/ year	75	90	Baseline Implementation Rate consistent with SWSA modeling and direction from Marin Water. Maximum Implementation Rate assumed 20% more participation than Baseline Implementation Rate.
Non-Residential Water Use Surveys	/ year	25	30	
Non-Functional Turf Conversion Rebate Program	sq ft / year	70,000	84,000	Baseline Implementation Rate consistent with SWSA modeling. Maximum Implementation Rate assumed 20% more participation than baseline implementation rate.
Pool Cover Rebate Program	rebate / year	90	108	
Rain Barrel and Cistern Rebate Program	gal of storage / year	15,000	18,000	
Residential CAPs - SFR	/ year	400	480	
Smart Irrigation Controller Rebate Program - SFR	rebate / year	99	119	
Smart Irrigation Controller Rebate Program – Large Landscape	rebate / year	1	2	Baseline Implementation Rate consistent with SWSA modeling. Maximum Implementation Rate assumed double the baseline implementation rate.
Turf Conversion Rebate Program - SFR	sq ft / year	95,215	114,258	Baseline Implementation Rate consistent with SWSA modeling. Maximum Implementation Rate assumed 20% more participation than baseline implementation rate.
Turf Conversion Rebate Program - CII	sq ft / year	4,785	5,742	

Notes:

(1) Pre-drought (2018-2019) and drought (2021-2022) implementation rate data provided either in SWSA or by Marin Water (Marin Water, 2023a).

Abbreviations:

AMI = Advanced Metering Infrastructure
CAP = Conservation Assistance Program
CII = Commercial, Industrial, Institutional

DSS = Demand Management Decision Support System Model
gal = gallon
gpy = gallons per year

IRRI = Irrigation
SFR = Single Family Residential
sq ft = square foot

SWSA = Strategic Water Supply Assessment
MFR = Multi-Family Residential

Table 3. Potential New Conservation Measures Savings Assumption and Costs

Measures	Sector	Useful Life (years)	Implementation Rate Unit	Savings Assumption (gpy per Implementation Rate Unit)	Customer Costs per Implementation Rate Unit	Costs to Marin Water (1) per Implementation Rate Unit	Notes
Commercial Large Landscape Water Budgets	IRRI	1	/ year	361,340	\$0	\$1,924	Useful life, savings assumption, and costs per the BAWSCA Annual Water Conservation Report FY 2020 -21 (BAWSCA, 2023).
District-Wide AMI Implementation - SFR	SFR	2	/ year	28,000	\$200	\$367	Useful life, savings assumption, and costs consistent with SWSA modeling and direction from Marin Water.
District-Wide AMI Implementation - MFR	MFR						
District-Wide AMI Implementation - CII	CII						
District-Wide AMI Implementation - IRRI	IRRI						
District-Wide AMI Implementation - OTH	OTH						
Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	IRRI	23	sq ft / year	31	\$12	\$4	Useful life and costs consistent with SWSA modeling. Savings assumption per the City of Petaluma DSS Model.
Leak Repair Discount Program - SFR	SFR	2	/ year	22,551	\$257	\$257	Useful life, savings assumption, and costs per the ACWD Leak Repair Program (ACWD, 2023).
Leak Repair Discount Program - MFR	MFR						
Leak Repair Discount Program - CII	CII						
Leak Repair Discount Program - IRRI	IRRI						
Residential Water Budget Pilot Program	SFR	1	/ year	60,223	\$0	\$962	Savings and costs assumed to be, respectively, 1/6 and 1/2 that of the Commercial Large Landscape Water Budgets Measure.
Water Efficient Landscape Direct Installation Program	SFR	10	sq ft / year	31	\$3	\$5	Useful life and costs consistent with SWSA modeling and Marin Water direction. Savings assumption per the City of Petaluma DSS Model.

Notes:

(1) Assumes a 30% markup to cover overhead costs.

Abbreviations:

ACWD = Alameda County Water District
 AMI = Advanced Metering Infrastructure
 BAWSCA = Bay Area Water Supply and Conservation Agency
 CII = Commercial, Industrial, Institutional

District = Marin Municipal Water District
 DSS = Demand Management Decision Support System Model
 gal = gallon
 FY = fiscal year

gpy = gallons per year
 IRRI = Irrigation
 OTH = Other
 SFR = Single Family Residential

sq ft = square foot
 SWSA = Strategic Water Supply Assessment
 MFR = Multi-Family Residential

Table 4. Potential New Conservation Measures Implementation Rates

Measures	Implementation Rate Unit	Baseline Implementation Rate	Maximum Implementation Rate	Notes
Commercial Large Landscape Water Budgets	/ year	170	204	Baseline Implementation Rate assumed to be 10% of Marin Water’s total irrigation accounts. Maximum Implementation Rate assumed to be 20% more participation than baseline implementation rate.
District-Wide AMI Implementation – SFR (1)	/ year	4,589	4,589	Baseline Implementation Rate and Maximum Implementation Rate assumed to be 10% of Marin Water’s accounts (not including the accounts already participating in AMI).
District-Wide AMI Implementation - MFR	/ year	379	379	
District-Wide AMI Implementation - CII	/ year	347	347	
District-Wide AMI Implementation - IRR	/ year	85	85	
District-Wide AMI Implementation - OTH	/ year	44	44	
Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	sq ft / year	2,500	3,000	Baseline Implementation Rate assumed to be one account per year, assuming the average square footage per account is 861 sq ft / account (per data from the Turf Conversion Rebate Program). Maximum Implementation Rate assumed 20% more participation than Baseline Implementation Rate.
Leak Repair Discount Program – SFR (2)	/ year	40	48	Baseline Implementation Rate assumed to be 0.08% of Marin Water’s accounts (the same participation percentage as the ACWD Leak Repair Program). Maximum Implementation Rate assumed to be 20% more participation than baseline implementation rate.
Leak Repair Discount Program - MFR		3	4	
Leak Repair Discount Program - CII		3	3	
Leak Repair Discount Program - IRR		1	1	
Residential Water Budget Pilot Program	/ year	28	100	Baseline Implementation Rate assumed to be 0.05% of Marin Water’s single-family residential accounts. Maximum Implementation Rate assumed not to exceed 100 / year as the measure is a pilot program.
Water Efficient Landscape Direct Installation Program	sq ft / year	20,665	24,798	Baseline Implementation Rate assumed to be two accounts per month (24 accounts / year), assuming the average square footage per account is 861 sq ft / account (per data from the Turf Conversion Rebate Program). Maximum Implementation Rate assumed 20% more participation than Baseline Implementation Rate.

Notes:

- (1) The District-Wide AMI Implementation is assumed to start in 2028 with the implementation rate increasing linearly by 25% up to the Baseline and Maximum Implementation Rate values shown here by 2031.
- (2) The Leak Repair Discount Program is assumed to start in 2025.

Abbreviations:

ACWD = Alameda County Water District	District = Marin Municipal Water District	SFR = Single Family Residential
AMI = Advanced Metering Infrastructure	IRRI = Irrigation	sq ft = square foot
CII = Commercial, Industrial, Institutional	OTH = Other	MFR = Multi-Family Residential

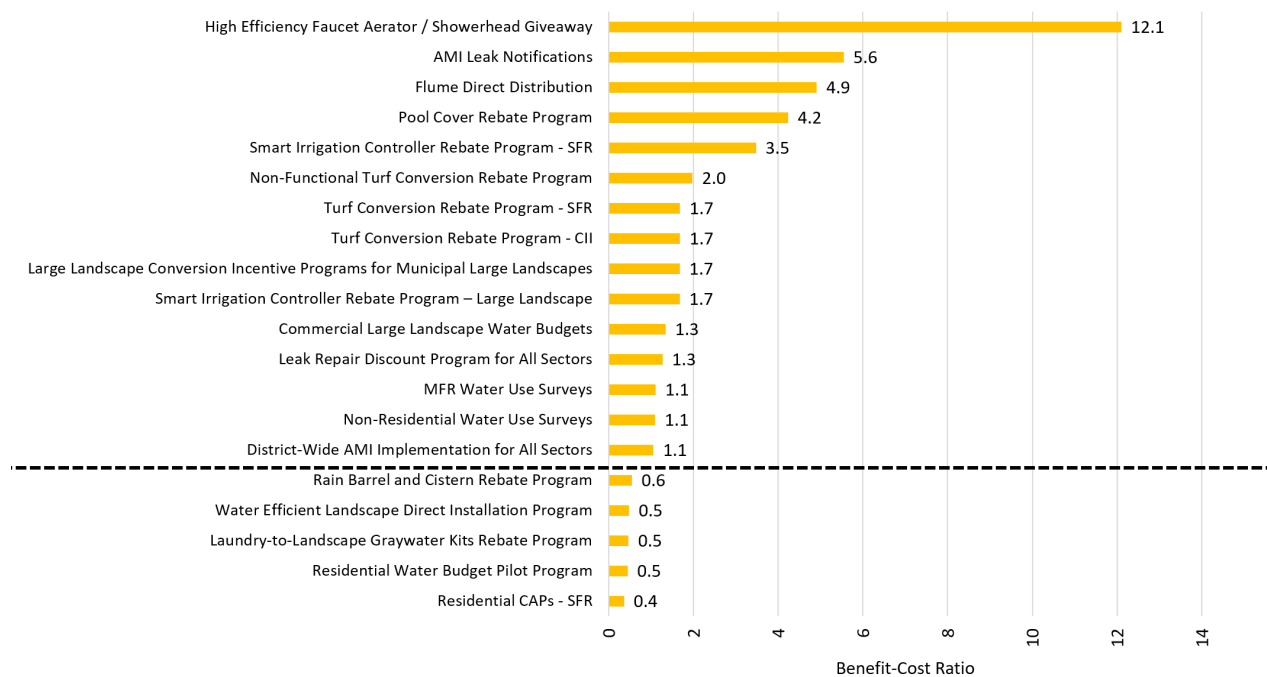
4 CONSERVATION PORTFOLIOS

Three conservation portfolios were analyzed to compare the possible savings potentials from different combinations of conservation measures and implementation rates.

4.1 Cost-Effective Incentives

The Cost-Effective Incentives conservation portfolio included only the conservation measures that were determined to be cost-effective for Marin Water. A benefit-cost analysis was run in the AWE Model assuming a cost of water of \$1,434/AF, consistent with the 2023 cost of purchasing Sonoma County Water Agency’s (SCWA) Russian River water system, escalated at 5.0% annually. The benefit-cost analysis took into consideration the useful life, savings potential, customer costs, and District costs for each measure to calculate the benefit-cost ratio. A benefit-cost ratio value greater than one indicates that the cost of implementing the program would be cheaper than treating or purchasing SCWA water. As shown in **Figure 2** below, the conservation measures above the dotted line have benefit-cost ratios greater than one and are determined to be cost-effective. **Table 5** below summarizes the measures included in the Cost-Effective Incentives conservation portfolio. The Baseline Implementation Rates were assumed for this conservation portfolio.

Figure 2. Benefit-Cost Ratio for all Evaluated Conservation Measures



4.2 Beyond Cost-Effective Incentives

For this conservation portfolio, all modeled conservation measures, including the additional customer support programs and innovative pilot projects that were not considered cost-effective in the benefit-cost analysis, are considered. Similarly to the Cost-Effective Incentive portfolio, this conservation portfolio assumes the Baseline Implementation Rates for each measure. **Table 5** summarizes the measures included in the Beyond Cost-Effective Incentives conservation portfolio.

4.3 Most Aggressive Implementation

For this conservation portfolio, the same conservation measures for the Beyond Cost-Effective Incentives portfolio are considered, except that this conservation portfolio assumes the Maximum Implementation Rates. **Table 5** summarizes the measures and implementation rates included in the Most Aggressive Implementation conservation portfolio.

Table 5. Conservation Portfolio Measures and Implementation Rates

Cost-Effective Incentives		Beyond Cost-Effective Incentives		Most Aggressive Implementation	
Measures	Baseline Implementation Rates	Measures	Baseline Implementation Rates	Measures	Maximum Implementation Rates
AMI Leak Notifications	1,250 / year	AMI Leak Notifications	1,250 / year	AMI Leak Notifications	1,250 / year
Commercial Large Landscape Water Budgets	170 / year	Commercial Large Landscape Water Budgets	170 / year	Commercial Large Landscape Water Budgets	204 / year
District-Wide AMI Implementation - CII	347 / year	District-Wide AMI Implementation - CII	347 / year	District-Wide AMI Implementation - CII	347 / year
District-Wide AMI Implementation - IRR1	85 / year	District-Wide AMI Implementation - IRR1	85 / year	District-Wide AMI Implementation - IRR1	85 / year
District-Wide AMI Implementation - MFR	379 / year	District-Wide AMI Implementation - MFR	379 / year	District-Wide AMI Implementation - MFR	379 / year
District-Wide AMI Implementation - OTH	44 / year	District-Wide AMI Implementation - OTH	44 / year	District-Wide AMI Implementation - OTH	44 / year
Flume Direct Distribution	500 / year	District-Wide AMI Implementation – SFR	4,589 / year	District-Wide AMI Implementation – SFR	4,589 / year
High Efficiency Faucet Aerator / Showerhead Giveaway	293 / year	Flume Direct Distribution	500 / year	Flume Direct Distribution (1)	600 / year
Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	2,500 rebate / year	High Efficiency Faucet Aerator / Showerhead Giveaway	293 / year	High Efficiency Faucet Aerator / Showerhead Giveaway	585 / year
Leak Repair Discount Program - CII	3 / year	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	2,500 rebate / year	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	3,000 rebate / year
Leak Repair Discount Program - IRR1	1 / year	Laundry-to-Landscape Graywater Kits Rebate Program	40 / year	Laundry-to-Landscape Graywater Kits Rebate Program	40 / year
Leak Repair Discount Program - MFR	3 / year	Leak Repair Discount Program - CII	3 / year	Leak Repair Discount Program - CII	3 / year
Leak Repair Discount Program – SFR (2)	40 / year	Leak Repair Discount Program - IRR1	1 / year	Leak Repair Discount Program - IRR1	1 / year
MFR Water Use Surveys	75 / year	Leak Repair Discount Program - MFR	3 / year	Leak Repair Discount Program - MFR	4 / year
Non-Functional Turf Conversion Rebate Program	70,000 sq ft / year	Leak Repair Discount Program – SFR	40 / year	Leak Repair Discount Program – SFR	48 / year
Non-Residential Water Use Surveys	25 / year	MFR Water Use Surveys	75 / year	MFR Water Use Surveys	90 / year
Pool Cover Rebate Program	90 rebate / year	Non-Functional Turf Conversion Rebate Program	70,000 sq ft / year	Non-Functional Turf Conversion Rebate Program	84,000 sq ft / year
Smart Irrigation Controller Rebate Program – Large Landscape	1 rebate / year	Non-Residential Water Use Surveys	25 / year	Non-Residential Water Use Surveys	30 / year
Smart Irrigation Controller Rebate Program - SFR	99 rebate / year	Pool Cover Rebate Program	90 rebate / year	Pool Cover Rebate Program	108 rebate / year
Turf Conversion Rebate Program - CII	4,785 sq ft / year	Rain Barrel and Cistern Rebate Program	15,000 gal of storage / year	Rain Barrel and Cistern Rebate Program	18,000 gal of storage / year
		Residential CAPs - SFR	400 / year	Residential CAPs - SFR	480 / year
		Residential Water Budget Pilot Program	28 / year	Residential Water Budget Pilot Program	100 / year
		Smart Irrigation Controller Rebate Program – Large Landscape	1 rebate / year	Smart Irrigation Controller Rebate Program – Large Landscape	2 rebate / year
		Smart Irrigation Controller Rebate Program - SFR	99 rebate / year	Smart Irrigation Controller Rebate Program - SFR	119 rebate / year
		Turf Conversion Rebate Program - CII	4,785 sq ft / year	Turf Conversion Rebate Program - CII	5,742 sq ft / year
		Turf Conversion Rebate Program - SFR	95,215 sq ft / year	Turf Conversion Rebate Program - SFR	114,258 sq ft / year
		Water Efficient Landscape Direct Installation Program	20,665 sq ft / year	Water Efficient Landscape Direct Installation Program	24,798 sq ft / year

Note:

(1) Per District direction, under the Most Aggressive Implementation portfolio, the Flume Direct Distribution implementation rates end in 2027.

Abbreviations:

AMI = Advanced Metering Infrastructure
CII = Commercial, Industrial, Institutional

gal = gallon
IRR1 = Irrigation

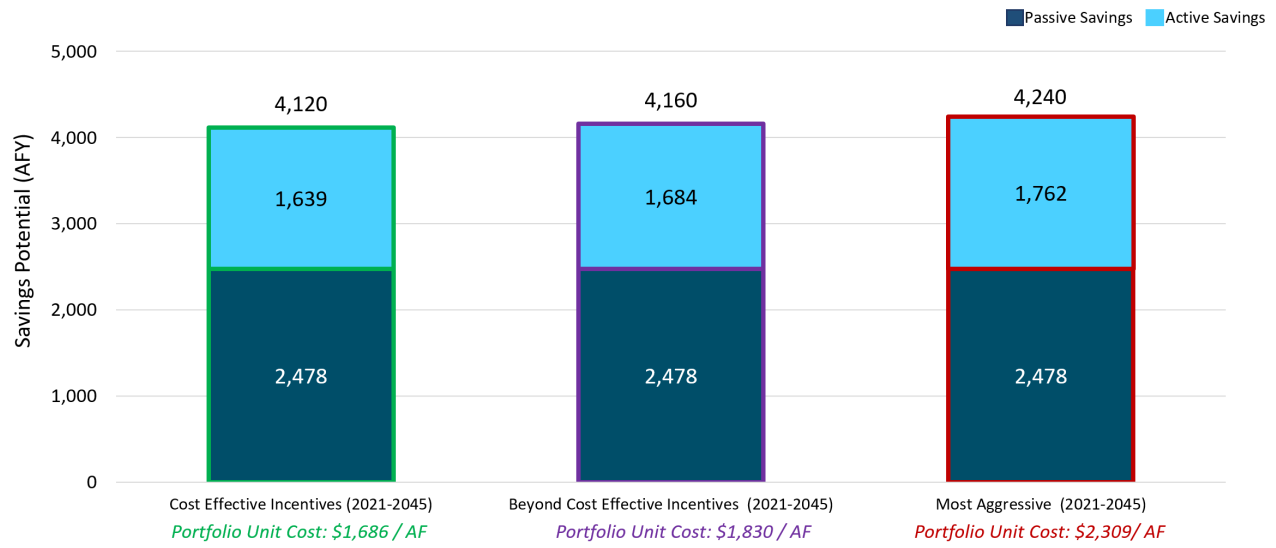
OTH = Other
SFR = Single Family Residential

sq ft = square foot
MFR = Multi-Family Residential

5 FINDINGS AND CONCLUSION

The savings assumption, costs, and implementation levels for the measures included in each portfolio were run through the AWE Model to estimate the active savings potential associated with each conservation portfolio. As shown in **Figure 3** below, the total savings potential associated with each conservation portfolio is the summation of the active and passive savings of each measure by 2045. Additionally, the AWE Model also estimated the unit costs for each portfolio, which are shown in **Figure 3**.

Figure 3. Total Conservation Savings (AFY) and Portfolio Unit Costs



Through this effort, Marin Water was able to estimate the achievable savings potential goal of 4,160 AFY (Beyond Cost-Effective conservation portfolio). This savings potential is used for further analysis in the WEMP.

6 AWE MODEL ASSUMPTIONS

The following pages include screenshots of the model inputs used in the AWE Model to calculate the savings potential and unit costs for each conservation portfolio showcased in **Figure 3** above.

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 library. It sounds like a lot, but you probably have developed much of this data for other planning purposes.

Scenario "Empty" loaded into model on 7/27/2

State
Volume Units
 Model will use CA plumbing standards
 Flow Units Will Be:

Population, Housing, and Account Forecasts

Enter Starting Year for 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

Population & Housing

	2010	2015	2020	2025	2030	2035	2040	2045
Population	183,716	191,575	191,269	202,510	218,444	223,251	227,005	230,996
Single Family Dwelling Units	55,038	55,291	55,202	58,447	63,045	64,433	65,516	66,668
Multi Family Dwelling Units	26,036	26,338	26,296	27,841	30,032	30,693	31,209	31,757

Number of Accounts

Single Family	51,241	51,474	51,392	57,738	64,138	64,870	65,816	66,779
Multi Family	3,778	3,801	3,795	3,937	4,096	4,150	4,220	4,290
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
 Annual Inflation Rate
 Nominal Interest Rate

Utility Rates in 2010

Customer Class

Single Family
Multi Family
CII
Irrigation
Other
Not in use
Not in use
Not in use
Not in use

Average Class Rate (2023 Dollars)				Annual Rate of Increase			
Water	Sewer	Electricity	Gas	Water	Sewer	Electricity	Gas
(\$/Thou Gal)	(\$/Thou Gal)	(\$/KWh)	(\$/Therm)	(%/Yr)	(%/Yr)	(%/Yr)	(%/Yr)
\$12.31		\$0.33	\$2.38	4.0%		3.0%	3.0%
\$8.82		\$0.33	\$2.38	4.0%		3.0%	3.0%
\$13.68		\$0.29	\$0.95	4.0%		3.0%	3.0%
\$15.18		\$0.37		4.0%		3.0%	3.0%
				4.0%		3.0%	3.0%

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	2.35	2.35	From 2023 DOF Table E-5
Full Baths/Dwelling Unit	2.01	1.68	
Half Baths/Dwelling Unit	0.24	0.59	
Dwelling 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.

$$use\ per\ site = \left(\frac{1}{irr.\ eff.} \right) \times (ET_0 \times K_L - R_e) \times Area \times C_v, \text{ where}$$

irr. eff. = typical irrigation efficiency

ET₀ = reference evapotranspiration

K_L = landscape coefficient (% of *ET₀* 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, M³ 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%

		Residential	Non Residential
Irrigation Requirement			
Turf Area	in/ft ² /yr	32	32
Other	in/ft ² /yr	8	8

		Residential	Non Residential
Avg Landscape Water Use Per Site			
Turf Area	Gal/Yr	0	0
Other	Gal/Yr	0	0
Total	Gal/Yr	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.**

Scenario "'Empty"' loaded into model on 7/27/2016 5:44:04 PM

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)	Utility Costs, Year Denominated	Utility Costs, Initial Variable (\$/unit)	Participant Costs, Year Denominated	Participant Costs, Initial (\$)	Participant Savings, Sewer (gpy)	Participant Savings, Gas (Therms/Gal)
1	Residential CAPs - SFR	Single Family	6,273	20%	80%	5	2021	\$430			4,949	0.001
2	Turf Conversion Rebate Program - SFR	Single Family	31	0%	80%	23	2021	\$3.9	2021	\$12	0	0
3	Smart Irrigation Controller Rebate Program - SFR	Single Family	5,840	0%	80%	10	2021	\$130	2021	\$250	0	0
4	Non-Residential Water Use Surveys	CII	93,521	20%	0%	5	2019	\$2,000	2019	\$2,500	0	0
5	Smart Irrigation Controller Rebate Program - IRR1	Irrigation	32,704	0%	80%	10	2019	\$1,422	2019	\$569	0	0
6	MFR Water Use Surveys	Multi Family	93,521	20%	0%	5	2019	\$2,000	2019	\$2,500	0	0
7	High Efficiency Faucet Aerator / Showerhead Giveaway	Single Family	4,013	0%	0%	15	2019	\$40	2019	\$50	0	0
8	Turf Conversion Rebate Program - CII	CII	31	0%	80%	23	2021	\$4	2021	\$12	0	0
9	Flume Direct Distribution	Single Family	9,426	0%	80%	10	2021	\$150	2021	\$250	0	0
10	Commercial Large Landscape Water Budgets	Irrigation	361,340	0%	0%	1	2020	\$1,924	2019	\$0	0	0
11	Residential Water Budget Pilot Program	Single Family	60,223	0%	0%	1	2020	\$962	2019	\$0	0	0
12	Leak Repair Discount Program - SFR	Single Family	22,551	0%	0%	2	2020	\$257	2019	\$257	0	0
13	Leak Repair Discount Program - MFR	Multi Family	22,551	0%	0%	2	2020	\$257	2019	\$257	0	0
14	Leak Repair Discount Program - CII	CII	22,551	0%	0%	2	2020	\$257	2019	\$257	0	0
15	Leak Repair Discount Program - IRR1	Irrigation	22,551	0%	0%	2	2020	\$257	2019	\$257	0	0
16	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	Irrigation	31	0%	80%	23	2019	\$3.9	2019	\$12.0	0	0
17	Water Efficient Landscape Direct Installation Program	Single Family	31	0%	0%	10	2019	\$5.00	2019	\$3.0	0	0
18	Pool Cover Rebate Program	Single Family	15,050	0%	80%	5	2021	\$130	2021	\$200	0	0
19	Rain Barrel and Cistern Rebate Program	Single Family	2	0%	80%	20	2021	\$0.7	2021	\$3.0	0	0
20	Non-Functional Turf Conversion Rebate Program - IRR1	Irrigation	35	0%	80%	23	2021	\$3.90	2021	\$12.00	0	0
21	Laundry-to-Landscape Graywater Kits Rebate Program	Single Family	4,413	0%	80%	10	2021	\$162.00	2021	\$2,000.00	0	0
22	AMI Leak Notifications	Single Family	28,000	20%	80%	2	2021	\$65.00	2021	\$200.00	0	0
23	District-wide AMI Implementation - SFR	Single Family	28,000	20%	80%	2	2021	\$367.33	2021	\$200.00	0	0
24	District-wide AMI Implementation - MFR	Multi Family	28,000	20%	80%	2	2021	\$367.33	2021	\$200.00	0	0
25	District-wide AMI Implementation - CII	CII	28,000	20%	80%	2	2021	\$367.33	2021	\$200.00	0	0
26	District-wide AMI Implementation - IRR1	Irrigation	28,000	20%	80%	2	2021	\$367.33	2021	\$200.00	0	0
27	District-wide AMI Implementation - OTH	Other	28,000	20%	80%	2	2021	\$367.33	2021	\$200.00	0	0

AWE CONSERVATION TRACKING TOOL: ENTER ANNUAL

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 any year in the forecast period. You do not have to start it at the beginning. It is also okay to skip years, for example if an activity is operated every other year, or every third year. If you have annual conservation program costs that are not accounted

Enter Annual Conservation Activity

Activity ID	Class	Activity Name	2020	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	Turf Conversion Rebate Program - SFR	7366	390381	142822	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215
2	Single Family	Smart Irrigation Controller Rebate Program - SFR		474	200	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
3	CII	Non-Residential Water Use Surveys	2	7	43	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
4	Irrigation	Smart Irrigation Controller Rebate Program - IRR		6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	Multi Family	MFR Water Use Surveys	6	20	43	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
6	Single Family	High Efficiency Faucet Aerator / Showerhead Giveaway		83	36	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293
7	CII	Turf Conversion Rebate Program - CII	370	19619	7178	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785
8	Single Family	Flume Direct Distribution		2000	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
9	Irrigation	Commercial Large Landscape Water Budgets							170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
10	Single Family	Leak Repair Discount Program - SFR						40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
11	Multi Family	Leak Repair Discount Program - MFR						3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
12	CII	Leak Repair Discount Program - COM						3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
13	Irrigation	Leak Repair Discount Program - IRR						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
14	Irrigation	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes						2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
15	Single Family	Pool Cover Rebate Program	12	399	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
16	Irrigation	Non-Functional Turf Conversion Rebate Program - IRR				70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000
17	Single Family	AMI Leak Notifications	1140	1,257	1,257	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
18	Single Family	District-wide AMI Implementation - SFR											1,147	2,295	3,442	4,589	4,589	4,589	4,589	4,589	4,589	4,589	4,589	4,589	4,589	4,589	4,589	4,589
19	Multi Family	District-wide AMI Implementation - MFR											95	190	285	379	379	379	379	379	379	379	379	379	379	379	379	379
20	CII	District-wide AMI Implementation - CII											87	174	260	347	347	347	347	347	347	347	347	347	347	347	347	347
21	Irrigation	District-wide AMI Implementation - IRR											21	42	64	85	85	85	85	85	85	85	85	85	85	85	85	85
22	Other	District-wide AMI Implementation - OTH											11	22	33	44	44	44	44	44	44	44	44	44	44	44	44	44

Annual Program Overhead Cost (2023 dollars)

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	2020	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	Turf Conversion Rebate Program - SFR	7,366	397,747	540,569	635,784	730,999	826,214	921,428	1,016,643	1,111,858	1,207,073	1,302,288	1,397,503	1,492,718	1,587,932	1,683,147	1,778,362	1,873,577	1,968,792	2,064,007	2,159,222	2,254,436	2,349,651	2,444,866	2,532,715	2,237,549	2,189,942
2	Single Family	Smart Irrigation Controller Rebate Program - SFR	0	474	674	773	872	971	1,070	1,169	1,268	1,367	1,466	1,565	1,664	1,763	1,862	1,961	2,060	2,159	2,258	2,357	2,456	2,555	2,654	2,753	2,852	2,951
3	CII	Non-Residential Water Use Surveys	2	9	50	65	77	86	91	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
4	Irrigation	Smart Irrigation Controller Rebate Program - IRR	0	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
5	Multi Family	MFR Water Use Surveys	6	25	63	125	175	213	239	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252
6	Single Family	High Efficiency Faucet Aerator / Showerhead Giveaway	0	83	119	412	705	998	1,291	1,584	1,877	2,170	2,463	2,756	3,049	3,342	3,635	3,928	4,138	4,395	4,395	4,395	4,395	4,395	4,395	4,395	4,395	4,395
7	CII	Turf Conversion Rebate Program - CII	370	19,989	27,167	31,952	36,737	41,522	46,307	51,092	55,877	60,662	65,447	70,232	75,017	79,802	84,587	89,372	94,157	98,942	103,727	108,512	113,297	118,082	122,867	127,652	132,437	137,222
8	Single Family	Flume Direct Distribution	0	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500	9,000	9,500	10,000	10,500	11,000	11,500	12,000	12,500	13,000	13,500	14,000
9	Irrigation	Commercial Large Landscape Water Budgets	0	0	0	0	0	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
10	Single Family	Leak Repair Discount Program - SFR	0	0	0	0	0	40	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
11	Multi Family	Leak Repair Discount Program - MFR	0	0	0	0	0	3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
12	CII	Leak Repair Discount Program - COM	0	0	0	0	0	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
13	Irrigation	Leak Repair Discount Program - IRR	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
14	Irrigation	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	0	0	0	0	0	2500	5000	7500	10000	12500	15000	17500	20000	22500	25000	27500	30000	32500	35000	37500	40000	42500	45000	47500	50000	
15	Single Family	Pool Cover Rebate Program	12	411	501	591	681	771	861	951	1,041	1,131	1,221	1,311	1,401	1,491	1,581	1,671	1,761	1,851	1,941	2,031	2,121	2,211	2,301	2,391	2,481	2,571
16	Irrigation	Non-Functional Turf Conversion Rebate Program - IRR	0	0	0	70000	140000	210000	280000	350000	420000	490000	560000	630000	700000	770000	840000	910000	980000	1050000	1120000	1190000	1260000	1330000	1400000	1470000	1540000	
17	Single Family	AMI Leak Notifications	1140	2169	2263	2256	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250	2250
18	Single Family	District-wide AMI Implementation - SFR	0	0	0	0	0	0	0	0	1147	3212	5278	7343	9408	11473	13538	15603	17668	19733	21798	23863	25928	27993	30058	32123	34188	
19	Multi Family	District-wide AMI Implementation - MFR	0	0	0	0	0	0	0	0	95	190	285	379	474	569	663	758	853	948	1043	1138	1233	1328	1423	1518	1613	
20	CII	District-wide AMI Implementation - CII	0	0	0	0	0	0	0	0	87	174	260	347	434	521	608	695	782	869	956	1043	1130	1217	1304	1391	1478	
21	Irrigation	District-wide AMI Implementation - IRR	0	0	0	0	0	0	0	0	21	42	64	85	106	127	148	169	190	211	232	253	274	295</				

6	Single Family	High Efficiency Faucet Aerator / Showerhead Giveaway	\$0	\$2,018	\$2,945	\$10,374	\$18,056	\$25,993	\$34,233	\$42,751	\$51,545	\$60,616	\$69,963	\$79,706	\$89,749	\$100,095	\$110,743	\$121,692	\$130,522	\$141,097	\$143,566	\$146,034	\$148,503	\$151,195	\$153,887	\$156,580	\$159,272	\$161,964
7	CII	Turf Conversion Rebate Program - CII	\$68	\$3,754	\$5,193	\$6,215	\$7,268	\$8,354	\$9,486	\$10,652	\$11,854	\$13,090	\$14,361	\$15,690	\$17,058	\$18,463	\$19,907	\$21,389	\$22,942	\$24,538	\$26,174	\$27,853	\$29,572	\$31,380	\$33,233	\$35,030	\$31,479	\$31,330
8	Single Family	Flume Direct Distribution	\$0	\$114,216	\$145,313	\$177,426	\$210,556	\$244,703	\$280,282	\$316,970	\$354,767	\$393,673	\$433,688	\$339,655	\$345,703	\$351,751	\$357,799	\$363,847	\$370,444	\$377,040	\$383,637	\$390,233	\$396,829	\$404,024	\$411,218	\$418,413	\$425,607	\$432,801
9	Irrigation	Commercial Large Landscape Water Budgets	\$0	\$0	\$0	\$0	\$0	\$398,673	\$405,901	\$413,129	\$420,357	\$427,585	\$434,812	\$442,695	\$450,578	\$458,461	\$466,344	\$474,227	\$482,825	\$491,423	\$500,020	\$508,618	\$517,215	\$526,592	\$535,969	\$545,346	\$554,723	\$564,100
10	Single Family	Leak Repair Discount Program - SFR	\$0	\$0	\$0	\$0	\$0	\$5,854	\$11,921	\$12,133	\$12,346	\$12,558	\$12,770	\$13,002	\$13,233	\$13,465	\$13,696	\$13,928	\$14,180	\$14,433	\$14,685	\$14,938	\$15,190	\$15,466	\$15,741	\$16,016	\$16,292	\$16,567
11	Multi Family	Leak Repair Discount Program - MFR	\$0	\$0	\$0	\$0	\$0	\$403	\$821	\$836	\$850	\$865	\$880	\$896	\$911	\$927	\$943	\$959	\$977	\$994	\$1,012	\$1,029	\$1,046	\$1,065	\$1,084	\$1,103	\$1,122	\$1,141
12	CII	Leak Repair Discount Program - COM	\$0	\$0	\$0	\$0	\$0	\$369	\$751	\$764	\$778	\$791	\$804	\$819	\$833	\$848	\$863	\$877	\$893	\$909	\$925	\$941	\$957	\$974	\$991	\$1,009	\$1,026	\$1,043
13	Irrigation	Leak Repair Discount Program - IRR1	\$0	\$0	\$0	\$0	\$0	\$146	\$298	\$303	\$309	\$314	\$319	\$325	\$331	\$337	\$342	\$348	\$355	\$361	\$367	\$373	\$380	\$387	\$394	\$400	\$407	\$414
14	Irrigation	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	\$0	\$0	\$0	\$0	\$0	\$503	\$1,024	\$1,564	\$2,121	\$2,697	\$3,291	\$3,910	\$4,548	\$5,206	\$5,884	\$6,581	\$7,310	\$8,060	\$8,832	\$9,625	\$10,441	\$11,294	\$12,172	\$13,073	\$13,997	\$14,946
15	Single Family	Pool Cover Rebate Program	\$1,075	\$37,476	\$46,495	\$55,807	\$65,412	\$74,136	\$44,751	\$45,548	\$46,345	\$47,142	\$47,939	\$48,808	\$49,677	\$50,546	\$51,415	\$52,284	\$53,232	\$54,180	\$55,128	\$56,076	\$57,024	\$58,058	\$59,091	\$60,125	\$61,159	\$62,193
16	Irrigation	Non-Functional Turf Conversion Rebate Program - IRR1	\$0	\$0	\$0	\$15,372	\$31,273	\$47,702	\$64,756	\$82,387	\$100,594	\$119,377	\$138,737	\$158,909	\$179,710	\$201,139	\$223,197	\$245,884	\$269,599	\$294,000	\$319,087	\$344,859	\$371,317	\$399,052	\$427,534	\$456,765	\$486,743	\$517,470
17	Single Family	AMI Leak Notifications	\$189,946	\$367,949	\$390,662	\$396,267	\$402,080	\$408,877	\$416,290	\$423,703	\$431,115	\$438,528	\$445,941	\$454,026	\$462,111	\$470,195	\$478,280	\$486,365	\$495,182	\$504,000	\$512,818	\$521,635	\$530,453	\$540,070	\$549,687	\$559,304	\$568,921	\$578,538
18	Single Family	District-wide AMI Implementation - SFR	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$219,829	\$626,104	\$1,045,986	\$1,481,669	\$1,896,560	\$1,726,242	\$1,755,924	\$1,785,605	\$1,817,978	\$1,850,350	\$1,882,723	\$1,915,095	\$1,947,468	\$1,982,775	\$2,018,082	\$2,053,388	\$2,088,695	\$2,124,002
19	Multi Family	District-wide AMI Implementation - MFR	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$18,178	\$51,774	\$86,496	\$122,524	\$140,294	\$142,748	\$145,203	\$147,657	\$150,334	\$153,011	\$155,688	\$158,365	\$161,042	\$163,962	\$166,881	\$169,801	\$172,721	\$175,640
20	CII	District-wide AMI Implementation - CII	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16,624	\$47,348	\$79,100	\$112,047	\$128,298	\$130,543	\$132,787	\$135,032	\$137,480	\$139,928	\$142,376	\$144,824	\$147,272	\$149,942	\$152,612	\$155,282	\$157,952	\$160,622
21	Irrigation	District-wide AMI Implementation - IRR1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,065	\$11,578	\$19,343	\$27,399	\$31,373	\$31,922	\$32,471	\$33,020	\$33,619	\$34,217	\$34,816	\$35,414	\$36,013	\$36,666	\$37,319	\$37,972	\$38,625	\$39,278
22	Other	District-wide AMI Implementation - OTH	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,114	\$6,021	\$10,058	\$14,248	\$16,314	\$16,599	\$16,885	\$17,170	\$17,482	\$17,793	\$18,104	\$18,416	\$18,727	\$19,066	\$19,406	\$19,745	\$20,085	\$20,424
Total Avoided Cost			\$196,900	\$637,001	\$784,633	\$926,682	\$1,064,149	\$1,602,406	\$1,707,120	\$1,822,686	\$2,198,372	\$2,798,116	\$3,416,858	\$3,903,383	\$4,242,115	\$4,367,108	\$4,493,847	\$4,622,332	\$4,756,990	\$4,894,968	\$5,026,414	\$5,159,436	\$5,294,033	\$5,438,254	\$5,584,193	\$5,729,721	\$5,764,283	\$5,870,698

AWE CONSERVATION TRACKING TOOL: ENTER ANNUAL

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 any year in the forecast period. You do not have to start it at the beginning. It is also okay to skip years, for example if an activity is operated every other year, or every third year. If you have annual conservation program costs that are not accounted

Enter Annual Conservation Activity

Activity ID	Class	Activity Name	2020	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	Residential CAPs - SFR	156	534	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
2	Single Family	Turf Conversion Rebate Program - SFR	7366	390381	142822	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215	95215
3	Single Family	Smart Irrigation Controller Rebate Program - SFR		474	200	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99
4	CII	Non-Residential Water Use Surveys	2	7	43	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
5	Irrigation	Smart Irrigation Controller Rebate Program - IRR1		6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
6	Multi Family	MFR Water Use Surveys	6	20	43	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
7	Single Family	High Efficiency Faucet Aerator / Showerhead Giveaway		83	36	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293	293
8	CII	Turf Conversion Rebate Program - CII	370	19619	7178	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785	4785
9	Single Family	Flume Direct Distribution		2000	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
10	Irrigation	Commercial Large Landscape Water Budgets						170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
11	Single Family	Residential Water Budget Pilot Program						28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
12	Single Family	Leak Repair Discount Program - SFR						40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
13	Multi Family	Leak Repair Discount Program - MFR						3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
14	CII	Leak Repair Discount Program - CII						3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
15	Irrigation	Leak Repair Discount Program - IRR1						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	Irrigation	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes						2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
17	Single Family	Water Efficient Landscape Direct Installation Program						20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665	20665
18	Single Family	Pool Cover Rebate Program	12	399	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
19	Single Family	Rain Barrel and Cistern Rebate Program	460	43,497	25,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
20	Irrigation	Non-Functional Turf Conversion Rebate Program - IRR1				70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000	70000
21	Single Family	Laundry-to-Landscape Graywater Kits Rebate Program	5	44	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
22	Single Family	AMI Leak Notifications	1140	1,257	1,257	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
23	Single Family	District-wide AMI Implementation - SFR																										
24	Multi Family	District-wide AMI Implementation - MFR									95	190	285	379	379	379	379	379	379	379	379	379	379	379	379	379	379	379
25	CII	District-wide AMI Implementation - CII									87	174	260	347	347	347	347	347	347	347	347	347	347	347	347	347	347	347
26	Irrigation	District-wide AMI Implementation - IRR1									21	42	64	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85
27	Other	District-wide AMI Implementation - OTH									11	22	33	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44

Annual Program Overhead Cost (2023 dollars)

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	2020	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	Residential CAPs - SFR	156	659	927	1,142	1,313	1,400	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345	1,345
2	Single Family	Turf Conversion Rebate Program - SFR	7,366	397,747	540,569	635,784	730,999	826,214	921,428	1,016,643	1,111,858	1,207,073	1,302,288	1,397,503	1,492,718	1,587,932	1,683,147	1,778,362	1,873,577	1,968,792	2,064,007	2,159,222	2,254,436	2,349,651	2,444,866	2,532,715	2,237,549	2,189,942
3	Single Family	Smart Irrigation Controller Rebate Program - SFR	0	474	674	773	872	971	1,070	1,169	1,268	1,367	1,466	1,565	1,664	1,763	1,862	1,961	2,060	2,159	2,258	2,357	2,456	2,555	2,654	2,753	2,852	2,951
4	CII	Non-Residential Water Use Surveys	2	9	50	65	77	86	91	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
5	Irrigation	Smart Irrigation Controller Rebate Program - IRR1	0	6	7	8	9	10	11	12	13	14	15	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
6	Multi Family	MFR Water Use Surveys	6	25	63	125	175	213	239	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252
7	Single Family	High Efficiency Faucet Aerator / Showerhead Giveaway	0	83	119	412	705	998	1,291	1,584	1,877	2,170	2,463	2,756	3,049	3,342	3,635	3,928	4,221	4,514	4,807	5,100	5,393	5,686	5,979	6,272	6,565	6,858
8	CII	Turf Conversion Rebate Program - CII	370	19,989	27,167	31,952	36,737	41,522	46,307	51,092	55,877	60,662	65,447	70,232	75,017	79,802	84,587	89,372	94,157	98,942	103,727	108,512	113,297	118,082	122,867	127,652	132,437	137,222
9	Single Family	Flume Direct Distribution	0	2,000	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000	7,500	8,000	8,500	9,000	9,500	10,000	10,500	11,000	11,500	12,000	12,500	13,000	13,500	14,000
10	Irrigation	Commercial Large Landscape Water Budgets	0	0	0	0	0	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170	170
11	Single Family	Residential Water Budget Pilot Program	0	0	0	0	0	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
12	Single Family	Leak Repair Discount Program - SFR	0	0	0	0	0	40	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
13	Multi Family	Leak Repair Discount Program - MFR	0	0	0	0	0	3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
14	CII	Leak Repair Discount Program - CII	0	0	0	0	0	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
15	Irrigation	Leak Repair Discount Program - IRR1	0	0	0	0	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16	Irrigation	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	0	0	0	0	0	2500	5000	7500	10000	12500	15000	17500	20000	22500	25000	27500	30000	32500	35000	37500	40000	42500	45000	47500	50000	

11	Single Family	Residential Water Budget Pilot Program	0.0	0.0	0.0	0.0	0.0	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	
12	Single Family	Leak Repair Discount Program - SFR	0.0	0.0	0.0	0.0	0.0	2.6	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
13	Multi Family	Leak Repair Discount Program - MFR	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4		
14	CII	Leak Repair Discount Program - CII	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		
15	Irrigation	Leak Repair Discount Program - IRR	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
16	Irrigation	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.7	1.0	1.2	1.4	1.7	1.9	2.1	2.4	2.6	2.9	3.1	3.3	3.6	3.8	4.0	4.3	4.5		
17	Single Family	Water Efficient Landscape Direct Installation Program	0.0	0.0	0.0	0.0	0.0	2.0	3.9	5.9	7.9	9.8	11.8	13.8	15.7	17.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7	19.7		
18	Single Family	Pool Cover Rebate Program	0.6	19.0	23.1	27.3	31.5	35.1	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8		
19	Single Family	Rain Barrel and Cistern Rebate Program	0.0	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	1.9	1.8	1.8		
20	Irrigation	Non-Functional Turf Conversion Rebate Program - IRR	0.0	0.0	0.0	7.5	15.0	22.6	30.1	37.6	45.1	52.6	60.2	67.7	75.2	82.7	90.2	97.7	105.3	112.8	120.3	127.8	135.3	142.9	150.4	157.9		
21	Single Family	Laundry-to-Landscape Graywater Kits Rebate Program	0.1	0.7	1.2	1.7	2.3	2.8	3.4	3.9	4.5	5.0	5.5	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4		
22	Single Family	AMI Leak Notifications	98.0	186.4	194.4	193.8	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3		
23	Single Family	District-wide AMI Implementation - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	98.6	276.0	453.5	630.9	709.8	709.8	709.8	709.8	709.8	709.8	709.8	709.8	709.8	709.8	709.8	709.8		
24	Multi Family	District-wide AMI Implementation - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	22.8	37.5	52.2	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7		
25	CII	District-wide AMI Implementation - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	20.9	34.3	47.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7		
26	Irrigation	District-wide AMI Implementation - IRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	5.1	8.4	11.7	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1		
27	Other	District-wide AMI Implementation - OTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.7	4.4	6.1	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8		
Total Gross Water Savings			104.6	336.3	410.0	477.5	539.9	795.3	832.0	873.5	1,030.3	1,280.6	1,530.9	1,713.7	1,828.4	1,851.4	1,874.3	1,895.3	1,915.2	1,935.7	1,953.1	1,970.5	1,987.8	2,004.9	2,022.1	2,038.7	2,016.9	2,019.9

Peak Gross Water Savings (AF)

Activity ID	Class	Activity Name	2020	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	Residential CAPs - SFR	2.4	10.1	14.3	17.6	20.2	21.6	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7
2	Single Family	Turf Conversion Rebate Program - SFR	0.6	30.3	41.1	48.4	56.6	62.9	70.1	77.4	84.6	91.9	99.1	106.4	113.6	120.9	128.1	135.3	142.6	149.8	157.1	164.3	171.6	178.8	186.1	192.8	170.3	166.7
3	Single Family	Smart Irrigation Controller Rebate Program - SFR	0.0	6.8	9.7	11.1	12.5	13.9	15.3	16.8	18.2	19.6	21.0	15.6	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2
4	CII	Non-Residential Water Use Surveys	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	Irrigation	Smart Irrigation Controller Rebate Program - IRR	0.0	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
6	Multi Family	MFR Water Use Surveys	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	Single Family	High Efficiency Faucet Aerator / Showerhead Giveaway	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	CII	Turf Conversion Rebate Program - CII	0.0	1.5	2.1	2.4	2.8	3.2	3.5	3.9	4.3	4.6	5.0	5.3	5.7	6.1	6.4	6.8	7.2	7.5	7.9	8.3	8.6	9.0	9.4	9.7	8.6	8.4
9	Single Family	Flume Direct Distribution	0.0	46.3	57.9	69.4	81.0	92.6	104.1	115.7	127.3	138.9	150.4	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7	115.7
10	Irrigation	Commercial Large Landscape Water Budgets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	Single Family	Residential Water Budget Pilot Program	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	Leak Repair Discount Program - 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	0.0
13	Multi Family	Leak Repair Discount Program - 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	0.0
14	CII	Leak Repair Discount Program - 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	0.0
15	Irrigation	Leak Repair Discount Program - IRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	Irrigation	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.6	0.8	1.0	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.0	3.2	3.4	3.6	3.8	4.0
17	Single Family	Water Efficient Landscape Direct Installation Program	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	Single Family	Pool Cover Rebate Program	0.4	15.2	18.5	21.8	25.2	28.0	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6
19	Single Family	Rain Barrel and Cistern Rebate Program	0.0	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.5	1.5	1.5	1.5	1.5
20	Irrigation	Non-Functional Turf Conversion Rebate Program - IRR	0.0	0.0	0.0	6.0	12.0	18.0	24.1	30.1	36.1	42.1	48.1	54.1	60.2	66.2	72.2	78.2	84.2	90.2	96.2	102.3	108.3	114.3	120.3	126.3	132.3	138.3
21	Single Family	Laundry-to-Landscape Graywater Kits Rebate Program	0.1	0.5	1.0	1.4	1.8	2.3	2.7	3.1	3.6	4.0	4.4	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
22	Single Family	AMI Leak Notifications	78.4	149.1	155.5	155.1	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7
23	Single Family	District-wide AMI Implementation - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78.9	220.8	362.8	504.8	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9
24	Multi Family	District-wide AMI Implementation - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	18.3	30.0	41.7	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
25	CII	District-wide AMI Implementation - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	16.7	27.4	38.2	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
26	Irrigation	District-wide AMI Implementation - IRR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	4.1	6.7	9.3	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
27	Other	District-wide AMI Implementation - OTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.1	3.5	4.9	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Total Gross Water Savings			81.9	260.5	300.9	334.3	367.1	398.7	413.8	441.2	562.2	758.0	953.7	1,095.5	1,182.8	1,196.7	1,210.6	1,224.5	1,238.4	1,252.3	1,266.2	1,280.1	1,293.9	1,307.6	1,321.4	1,334.6	1,317.2	1,319.6

Off Peak Gross Water Savings (AF)

Activity ID	Class	Activity Name	2020	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

AWE CONSERVATION TRACKING TOOL: UTILITY COSTS & BENEFITS WORKSHEET

Planned conservation cost benefit analysis, utility. This worksheet summarizes costs and benefits of planned conservation from the perspective of the utility. Costs include conservation program costs paid by the utility. Benefits include avoided water and wastewater production costs. Costs and benefits are expressed in terms of present value and unit cost.

Conservation Program Cost Analysis (2023 Dollars)

Class	Activity Name	Unit Cost (\$/AF)	Discounted Cumulative Water Savings (AF)	Present Value Cost	2020	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			
Single Family	Residential CAPs - SFR	\$	6,974	788	\$ 4,498,411	\$71,179	\$243,051	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510	\$182,510		
Single Family	Turf Conversion Rebate Program - SFR	\$	1,751	7,488	\$1,615,519	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042	\$394,042		
Single Family	Smart Irrigation Controller Rebate Program - SFR	\$	746	632	\$ 471,734	\$0	\$65,985	\$27,589	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656	\$13,656		
CI	Non-Residential Water Use Surveys	\$	2,309	718	\$ 1,051,297	\$4,504	\$15,763	\$96,831	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297	\$56,297		
Irrigation	Smart Irrigation Controller Rebate Program - IRR	\$	1,546	36	\$ 55,626	\$0	\$9,607	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601	\$1,601		
Multi Family	MFR Water Use Surveys	\$	2,309	2,061	\$ 4,759,038	\$13,511	\$45,038	\$96,831	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892	\$168,892		
Single Family	High Efficiency Faucet Aerator / Showerhead Giveaway	\$	254	1,570	\$ 367,220	\$0	\$3,795	\$1,594	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295	\$13,295		
CI	Turf Conversion Rebate Program - CI	\$	1,751	377	\$ 859,759	\$1,531	\$81,190	\$29,705	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	\$18,802	
Single Family	Flume Direct Distribution	\$	533	4,863	\$ 2,593,157	\$0	\$318,332	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	\$79,583	
Irrigation	Commercial Large Landscape Water Budgets	\$	1,886	4,710	\$ 4,932,769	\$0	\$0	\$0	\$0	\$0	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	\$357,513	
Single Family	Residential Water Budget Pilot Program	\$	5,889	199	\$ 735,640	\$0	\$0	\$0	\$0	\$0	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	\$29,442	
Single Family	Leak Repair Discount Program - SFR	\$	2,021	139	\$ 280,590	\$0	\$0	\$0	\$0	\$0	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	\$11,230	
Multi Family	Leak Repair Discount Program - MFR	\$	2,021	10	\$ 21,044	\$0	\$0	\$0	\$0	\$0	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	\$842	
Irrigation	Leak Repair Discount Program - CI	\$	2,021	9	\$ 11,672	\$0	\$0	\$0	\$0	\$0	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	\$707	
Irrigation	Leak Repair Discount Program - IRR	\$	2,021	3	\$ 7,015	\$0	\$0	\$0	\$0	\$0	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281	\$281
Irrigation	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	\$	1,858	148	\$ 274,294	\$0	\$0	\$0	\$0	\$0	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978	\$10,978
Single Family	Water Efficient Landscape Direct Installation Program	\$	576	507	\$ 2,006,812	\$0	\$0	\$0	\$0	\$0	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338	\$116,338
Single Family	Pool Cover Rebate Program	\$	589	700	\$ 1,412,111	\$1,655	\$55,040	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415	\$12,415
Single Family	Rain Barrel and Cistern Rebate Program	\$	5,257	63	\$ 332,662	\$3,177	\$30,001	\$17,243	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346	\$10,346
Irrigation	Non-Functional Turf Conversion Rebate Program - IRR	\$	1,511	5,077	\$ 1,874,016	\$0	\$0	\$0	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682	\$269,682
Single Family	Laundry-to-Landscape Graywater Kits Rebate Program	\$	5,713	165	\$ 944,925	\$859	\$31,778	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090	\$31,090
Single Family	AMI Leak Notifications	\$	445	5,883	\$ 2,615,467	\$78,628	\$86,696	\$86,696	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215	\$86,215
Single Family	District-wide AMI Implementation - SFR	\$	2,512	14,189	\$35,646,143	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Multi Family	District-wide AMI Implementation - MFR	\$	2,512	1,173	\$ 2,947,687	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
CI	District-wide AMI Implementation - CI	\$	2,512	1,073	\$ 2,695,649	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Irrigation	District-wide AMI Implementation - IRR	\$	2,512	262	\$ 659,178	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Other	District-wide AMI Implementation - OTH	\$	2,512	136	\$ 342,772	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Subtotal Conservation Activities		\$	1,830	\$2,922	\$96,837,110	\$202,668	\$2,601,767	\$1,254,772	\$1,359,414	\$1,359,414	\$1,886,746	\$1,886,746	\$1,886,746	\$2,417,299	\$2,947,852	\$3,478,405	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	
Program Overhead		\$		\$2,922	\$96,837,110	\$0	\$0	\$0	\$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 with Overhead		\$	1,830	\$2,922	\$96,837,110	\$202,668	\$2,601,767	\$1,254,772	\$1,359,414	\$1,359,414	\$1,886,746	\$1,886,746	\$1,886,746	\$2,417,299	\$2,947,852	\$3,478,405	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	\$4,008,958	

Conservation Benefit Analysis (2023 Dollars)

Class	Activity Name	Unit Benefit (\$/AF)	Discounted Cumulative Water Savings (AF)	Present Value Benefit	Deferred System Capacity Expansion Benefit	2020	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
Single Family	Residential CAPs - SFR	\$	2,521	788	\$ 1,987,435	\$ -	\$5,823	\$25,038	\$36,860	\$44,933	\$52,979	\$59,738	\$66,729	\$72,984	\$78,614	\$83,656	\$88,119	\$92,099	\$95,596	\$98,606	\$101,134	\$103,284	\$105,059	\$106							

7	Single Family	High Efficiency Faucet Aerator / Showerhead Giveaway	0.0	1.0	1.5	8.7	15.9	23.1	30.3	37.5	44.7	51.9	59.1	66.3	73.5	80.7	87.9	95.1	101.3	108.1	108.1	108.1	108.1	108.1	108.1	108.1	108.1	
8	CII	Turf Conversion Rebate Program - CII	0.0	1.9	2.6	3.1	3.7	4.2	4.8	5.3	5.9	6.4	7.0	7.5	8.0	8.6	9.1	9.7	10.2	10.8	11.3	11.9	12.4	13.0	13.5	14.0	12.7	12.6
9	Single Family	Flume Direct Distribution	0.0	57.9	72.3	89.7	107.0	124.4	141.7	159.1	159.1	159.1	159.1	101.2	86.8	69.4	52.1	34.7	17.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	Irrigation	Commercial Large Landscape Water Budgets	0.0	0.0	0.0	0.0	0.0	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2	226.2
11	Single Family	Residential Water Budget Pilot Program	0.0	0.0	0.0	0.0	0.0	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	
12	Single Family	Leak Repair Discount Program - SFR	0.0	0.0	0.0	0.0	0.0	3.3	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	
13	Multi Family	Leak Repair Discount Program - MFR	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
14	CII	Leak Repair Discount Program - CII	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
15	Irrigation	Leak Repair Discount Program - IRR1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
16	Irrigation	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	0.0	0.0	0.0	0.0	0.0	0.3	0.6	0.9	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.1	5.4	5.7	6.0
17	Single Family	Water Efficient Landscape Direct Installation Program	0.0	0.0	0.0	0.0	0.0	2.4	4.7	7.1	9.4	11.8	14.2	16.5	18.9	21.2	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	
18	Single Family	Pool Cover Rebate Program	0.6	19.0	23.1	28.1	33.1	37.5	24.1	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	
19	Single Family	Rain Barrel and Cistern Rebate Program	0.0	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.9	2.0	2.1	2.2	2.3	2.4	2.3	2.2	2.2	2.2	
20	Irrigation	Non-Functional Turf Conversion Rebate Program - IRR1	0.0	0.0	0.0	9.0	18.0	27.1	36.1	45.1	54.1	63.2	72.2	81.2	90.2	99.2	108.3	117.3	126.3	135.3	144.4	153.4	162.4	171.4	180.5	189.5	198.5	207.5
21	Single Family	Laundry-to-Landscape Graywater Kits Rebate Program	0.1	0.7	1.2	1.7	2.3	2.8	3.4	3.9	4.5	5.0	5.5	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
22	Single Family	AMI Leak Notifications	98.0	186.4	194.4	193.8	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	193.3	
23	Single Family	District-wide AMI Implementation - 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	98.6	276.0	709.8	709.8	709.8	709.8	709.8	709.8	709.8	709.8	709.8	709.8	709.8	
24	Multi Family	District-wide AMI Implementation - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	22.8	37.5	52.2	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	
25	CII	District-wide AMI Implementation - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	20.9	34.3	47.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	53.7	
26	Irrigation	District-wide AMI Implementation - IRR1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	5.1	8.4	11.7	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	
27	Other	District-wide AMI Implementation - OTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.7	4.4	6.1	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	
Total Active Water Savings			104.6	336.3	410.0	496.0	575.4	898.8	951.4	1,007.5	1,157.8	1,401.6	1,645.3	1,821.5	1,929.7	1,942.7	1,955.8	1,966.5	1,976.1	1,986.4	2,007.2	2,028.0	2,048.9	2,069.4	2,090.1	2,110.1	2,091.8	2,098.3

Peak Active Water Savings (AF)

Activity ID	Class	Activity Name	2020	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	Residential CAPs - SFR	2.4	10.1	14.3	18.8	22.4	24.6	24.3	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9
2	Single Family	Turf Conversion Rebate Program - SFR	0.6	30.3	41.1	49.8	58.5	67.2	75.9	84.6	93.3	102.0	110.7	119.4	128.1	136.8	145.5	154.2	162.9	171.6	180.3	189.0	197.7	206.4	215.1	223.2	202.2	200.0
3	Single Family	Smart Irrigation Controller Rebate Program - SFR	0.0	6.8	9.7	11.4	13.1	14.8	16.5	18.2	19.9	21.6	23.3	18.2	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
4	CII	Non-Residential Water Use Surveys	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	Irrigation	Smart Irrigation Controller Rebate Program - IRR1	0.0	0.5	0.6	0.7	0.9	1.0	1.2	1.4	1.5	1.7	1.8	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
6	Multi Family	MFR Water Use Surveys	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	Single Family	High Efficiency Faucet Aerator / Showerhead Giveaway	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	CII	Turf Conversion Rebate Program - CII	0.0	1.5	2.1	2.5	2.9	3.4	3.8	4.3	4.7	5.1	5.6	6.0	6.4	6.9	7.3	7.7	8.2	8.6	9.1	9.5	9.9	10.4	10.8	11.2	10.2	10.1
9	Single Family	Flume Direct Distribution	0.0	46.3	57.9	71.7	85.6	99.5	113.4	127.3	127.3	127.3	81.0	69.4	55.5	41.7	27.8	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Irrigation	Commercial Large Landscape Water Budgets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	Single Family	Residential Water Budget Pilot Program	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	Leak Repair Discount Program - 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	0.0
13	Multi Family	Leak Repair Discount Program - 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	0.0
14	CII	Leak Repair Discount Program - 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	0.0
15	Irrigation	Leak Repair Discount Program - IRR1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	Irrigation	Large Landscape Conversion Incentive Programs for Municipal Large Landscapes	0.0	0.0	0.0	0.0	0.0	0.2	0.5	0.7	0.9	1.1	1.4	1.6	1.8	2.1	2.3	2.5	2.7	3.0	3.2	3.4	3.7	3.9	4.1	4.3	4.6	4.8
17	Single Family	Water Efficient Landscape Direct Installation Program	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	Single Family	Pool Cover Rebate Program	0.4	15.2	18.5	22.5	26.5	30.0	19.3	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
19	Single Family	Rain Barrel and Cistern Rebate Program	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8
20	Irrigation	Non-Functional Turf Conversion Rebate Program - IRR1	0.0	0.0	0.0	7.2	14.4	21.7	28.9	36.1	43.3	50.5	57.7	65.0	72.2	79.4	86.6	93.8	101.1	108.3	115.5	122.7	129.9	137.1	144.4	151.6	158.8	166.0
21	Single Family	Laundry-to-Landscape Graywater Kits Rebate Program	0.1	0.5	1.0	1.4	1.8	2.3	2.7	3.1	3.6	4.0	4.4	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
22	Single Family	AMI Leak Notifications	78.4	149.1	155.5	155.1	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7	154.7
23	Single Family	District-wide AMI Implementation - SFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78.9	220.8	362.8	504.8	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9	567.9
24	Multi Family	District-wide AMI Implementation - MFR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	18.3	30.0	41.7	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
25	CII	District-wide AMI Implementation - CII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	16.7	27.4	38.2	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9
26	Irrigation	District-wide AMI Implementation - IRR1																										

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Appendices

Five-Year Water Efficiency Master Plan

Marin Municipal Water District



Appendix B
Rebate Considerations

HIGH EFFICIENCY TOILET REBATE PROGRAM

Background:

The High Efficiency Toilet Rebate Program was established to incentivize the replacement of older, less efficient toilet fixtures with high-efficiency models. Over the years, these efforts, combined with state regulations and policy initiatives, have led to a significant increase in the adoption of high-efficiency toilet fixtures.

Recent legislative actions, such as California's adoption of AB715 in 2014 and the EPA's proposed revisions to the WaterSense Specification in 2023, have further reinforced the transition towards highly efficient toilet fixtures. These measures have effectively mandated low flush volumes, making it nearly impossible to purchase toilets that do not meet high-efficiency standards.

Discussion:

Legislative Mandates: Legislative actions at both the state and federal levels, such as AB715 and the EPA's proposed revisions to the WaterSense Specification, have rendered incentives for the purchase of high-efficiency toilets unnecessary. These measures have effectively mandated low flush volumes, making it nearly impossible to purchase toilets that do not meet high-efficiency standards of 1.28gpf or lower.

Diminishing Participation: Despite offering rebates of up to \$150 for replacing older toilets with high-efficiency models, the High Efficiency Toilet Rebate Program has experienced minimal uptake. In 2023, only 72 rebate applications were received, with 85% of these applications deemed ineligible due to flush volumes exceeding the 0.8 gallons per flush (gpf) requirement. This low participation rate reflects the limited number of eligible fixtures on the market at the ultra-efficiency level of 0.8gpf where all the other available fixtures have similarly low water use.

Resource Implications: While the direct costs associated with issuing rebates may appear minimal, it is crucial to consider the broader resource impacts on our operations. Handling customer inquiries regarding eligibility, processing denial letters, and maintaining the product eligibility list based on third-party testing all entail significant staff time and administrative resources. These resources could be redirected towards more impactful initiatives that address emerging challenges or support underserved areas within our community.

Recommendation:

Based on the diminishing relevance of the High Efficiency Toilet Rebate Program, as evidenced by low participation rates and legislative mandates mandating highly efficient fixtures, staff recommends the termination of the program. This action aligns with the evolving landscape of water conservation and legislative mandates, while allowing us to reallocate resources towards more pressing priorities.

HIGH EFFICIENCY CLOTHES WASHER REBATE PROGRAM

Background:

For decades, the District has operated the High Efficiency Clothes Washer Rebate Program, aimed at incentivizing the adoption of energy and water-efficient clothes washers within our service area. Similar to toilets, clothes washer standards have continuously evolved, reducing the acceptable levels of water and energy use for fixtures available on the market. Consequently, market transformation through these ongoing code updates has significantly contributed to the reduction of water usage by clothes washers, thereby diminishing the necessity for incentives.

Recent analyses, such as the Flume analysis of clothes washers, indicate a high saturation of high-efficiency washers within our service area. The vast majority of washers available on the market now meet efficiency standards, rendering incentives less impactful. Additionally, it is noted that there may be a substantial number of "free riders," customers who would purchase high-efficiency washers regardless of the presence of an incentive.

Despite these market transformations, the current rebate program continues to operate with approximately 8 participants each month, indicating diminishing relevance and effectiveness.

Discussion:

Market Saturation: The Flume analysis reveals a high saturation of high-efficiency washers within our service area, suggesting that incentives are no longer driving significant behavior change. With almost all washers on the market meeting efficiency standards, the need for incentives to encourage adoption has decreased.

Limited Impact: The current rebate program's low participation rates, with only about 8 participants each month, indicate diminishing relevance and effectiveness. These participation rates suggest that the program is not achieving its intended objectives efficiently.

Resource Allocation: While the direct costs associated with the limited number of rebates each month are relatively small, it is essential to consider the allocation of staff resources. By removing this program from the rebate portfolio, staff resources can be reallocated to focus on higher benefit programs that address emerging challenges or support underserved areas within our community. Additionally, directing funds towards other Water Efficiency programs where they can have a more significant impact aligns with our strategic objectives.

Recommendation: Based on the diminishing relevance and effectiveness of the High Efficiency Clothes Washer Rebate Program, staff recommends its termination. This action will allow us to streamline our rebate portfolio, focus staff resources on more impactful initiatives, and allocate funds towards programs with higher potential for water conservation and efficiency gains.

CUSTOM REBATE

Background:

The majority of District incentive programs have historically targeted single-family residential users, leaving Commercial, Industrial, Institutional, Irrigation, and Multi-Family customers with limited support for implementing water-saving upgrades. In response to this gap, a Custom Rebate program has been developed to provide tailored incentives for water-saving projects not covered by existing rebate programs. The Custom Rebate aims to support a diverse range of customers, including restaurants, schools, apartment complexes, and other entities, in implementing water-efficient changes.

Discussion:

The Custom Rebate program is designed to address the specific needs of Commercial, Industrial, Institutional, Irrigation, and Multi-Family customers. Key features of the program include:

1. **Project Eligibility:** Eligible projects must reliably estimate and verify water savings, fixture life, and costs prior to installation. Projects must not be covered by any existing rebate programs.
2. **Incentive Calculation:** The incentive amount will be calculated at 75% of the cost of water purchased from Sonoma Water, equating to 75% of \$1,400 per acre-foot or \$3 per ccf as of FY2024. The customer rebate amount will be the lesser of 50% cost share or based on the calculated water savings.
3. **Rebate Payment:** Rebate payments will be made in two installments: 50% after installation and the remaining rebate after demonstrating water savings over a 1-year period.
4. **Administrative Approval:** Projects with incentives exceeding \$25,000 will require additional administrative approval.

Sample Projects and Incentives:

To illustrate the potential benefits of the Custom Rebate program, below are four sample projects from local water retailers:

<i>Measure</i>	<i>Annual saving (gal)</i>	<i>Measure Cost</i>	<i>Rebate Based Savings</i>	<i>Rebate onBased 50% of Cost</i>	<i>Sample onFinal Rebate</i>	<i>\$/acft</i>
<i>Replace Water Cooled Chiller with Air Cooled Chiller</i>	230,124	\$ 258,603	\$ <u>13,844</u>	\$ 129,302	\$ 13,844	\$ 1,307
<i>Washing Machine Ozone Units</i>	316,820	\$ 4,067	\$ 12,707	\$ <u>2,034</u>	\$ 2,034	\$ 209
<i>De-Ionized Water Recirculation Loop</i>	4,644,000	\$ 45,635	\$ 465,642	\$ <u>22,818</u>	\$ 22,818	\$ 64
<i>Replaced Wet Vac with Dry Vac</i>	80,004	\$ 10,628	\$ <u>3,209</u>	\$ 5,314	\$ 3,209	\$1,307

Introducing the Custom Rebate program will provide crucial support for a wide range of customers in implementing water-efficient changes. By addressing the needs of Commercial, Industrial, Institutional, Irrigation, and Multi-Family customers, the program will contribute to overall water conservation efforts in the District. It is important to note that water savings are a prerequisite for qualification, ensuring that projects contribute to meaningful conservation outcomes.

Recommendation: Staff recommends the implementation of the Custom Rebate program to support water-saving projects for Commercial, Industrial, Institutional, Irrigation, and Multi-Family customers. The program's tailored incentives and focus on water savings align with the District's goals of promoting sustainable water use and conservation.



CUSTOM REBATE APPLICATION

OVERVIEW

Marin Water commercial and multi-family customers with an active potable water service can receive a rebate for implementing water-saving upgrades not covered through any other existing rebate programs. Rebate amounts are based on 50% of project costs (excluding tax and labor) or estimated water savings over a 12-month period, whichever is less. Rebates for water savings are based on \$3/billing unit saved. (1 billing unit = 100 cubic feet or 748 gallons).

TO APPLY

1. Complete and submit this application form to conservation@marinwater.org before beginning your project. Marin Water staff will evaluate the proposed project and contact you to arrange a pre-inspection site visit, including an indoor and outdoor Conservation Assistance Program (CAP) site survey.
2. Once your project is approved, purchase and install qualifying equipment at the property where potable water service is provided by Marin Water.
3. Submit receipts within 90 days of project completion (installation).
4. A final site inspection may be required. Marin Water will contact you to schedule a site visit, if required.

TERMS AND CONDITIONS

- Offer applies to Marin Water commercial and multi-family customers with an active potable water service.
- Applicants must be the Marin Water account holder and property owner, property owner with consent from the water-bill paying tenant or water bill-paying tenant with consent from property owner.
- Applicant certifies that necessary permissions have been obtained from property owner, if applicant is not the owner.
- Only projects approved after XX XX, 2024 are eligible for rebate, rebate is not retroactive.
- Rebates for project costs cover the cost of equipment only, excluding tax, delivery and labor.
- Equipment or technology must not be covered by any other existing Marin Water rebate program.
- Rebate payments will be made in two installments: 50% after installation with the remaining amount paid after one year of demonstrated water savings.
- Eligible projects must utilize water-saving equipment or technology with proven water savings and must reduce existing and future demand for potable water.

CUSTOM REBATE APPLICATION

- Projects must be completed within 180-days of approval. Applicants may submit a request for extension prior to the original completion date. Extension may be approved at Marin Water's sole discretion.
- Rebates are offered on a first-come, first-served basis, subject to availability of funds.
- Rebate amounts and eligible projects and equipment are subject to change at any time, without prior notice.
- Rebates will be paid to the name as it appears on the water bill, unless applicant is not the Marin Water account holder.
- Rebates over \$600 may be considered taxable income and a 1099 will be issued. For more information on whether your rebate check will be considered taxable income, please contact a qualified tax professional.
- Receipts must be legible and itemized to clearly show what has been purchased. If submitting an invoice from a contractor please ensure it includes the name and address of the contractor, itemized dollar amount of qualifying purchase(s), zero balance due, product brand, model and storage capacity. Receipts will not be returned—please make copies for your records.
- Equipment must be installed at the property where potable water service is provided by Marin Water.
- Marin Water reserves the right to request proof of installation and/or to inspect the property to verify that the product(s) is (are) installed, either before or after rebate is paid, and, if necessary, to recover rebated amounts on the water bill for any products not installed as required.
- Applicants are responsible for complying with all applicable codes and regulations.
- Projects must retrofit existing fixtures; new construction does not qualify.
- After receipts are submitted, allow six to eight weeks for processing.

CUSTOM REBATE APPLICATION

Marin Water Service Number:	Marin Water Customer Number:
Applicant Name:	
Affiliation (check all that apply): <input type="checkbox"/> Account Holder <input type="checkbox"/> Property Owner <input type="checkbox"/> Tenant	
Business, HOA or Condo Complex Name (if applicable):	
Site Address (where installed):	Unit #:
City:	Zip:
Mailing Address (if different from site address):	
Mailing City:	Mailing Zip:
Email:	Daytime Phone:
Project Description:	
Estimated Project Cost:	
Estimated Annual Water Savings (gallons):	
Applicant Signature:	Date:
SUBMIT COMPLETED APPLICATION WITH RECEIPTS: <u>By mail</u> Custom Rebate Marin Water 220 Nellen Avenue Corte Madera, CA 94925	FOR INTERNAL USE ONLY Site Visit Date: __ Staff: __
	Approved by: \$
By email Rebates@marinwater.org	

DISCLAIMER:
 Applicant expressly agrees that Marin Water may inspect all properties participating in this rebate program; that Marin Water does not guarantee the performance of any product receiving a rebate; and that Marin Water does not warrant any product or installation to be free of defects, the quality of workmanship, or the suitability of the premises or the product for the installation. Applicant further agrees to defend, indemnify, and hold harmless Marin Water, its directors, officers, agents, and employees, from and against any and all loss, damage, expense, claims suits, and liability, including attorney fees arising out of or in any way connected with the product(s) and its (their) installation. Applicant understands that installation of a qualifying product may not result in lower water bills. Marin Water reserves the right to change the terms of this rebate program offer at any time, without notification. Applicant has read, understands, and agrees to the terms and conditions of this rebate program.



Appendices

Five-Year Water Efficiency Master Plan

Marin Municipal Water District



Appendix C
Policy Considerations

GRAYWATER REGULATION

Background

In May 2016, the District took a significant step forward in water conservation efforts with the adoption of Ordinance 429, mandating the installation of graywater systems for all new service connections and sites needing a larger service connection due to a substantial remodel. While this initiative aimed to promote sustainable water usage, administrative challenges have hindered its effectiveness.

Despite administrative adjustments in 2022, nearly 38% of sites are still classified as "Not-Feasible," indicating that customers have encountered difficulties in implementing graywater systems. To address this issue and uphold the original intent of achieving outdoor water savings from new connection applicants, we propose amendments to Ordinance 429 to incorporate alternative options.

The proposed code amendments were drafted to offer applicants a range of water-saving options, ensuring flexibility while promoting conservation. These options include:

1. **Drought Tolerant Landscaping:** Utilizing "low" or "very low" plant material, as classified by WUCOLS, in 100% of new or rehabilitated planting areas exceeding 500 square feet, with no irrigation or low-volume irrigation.
2. **Graywater Systems:** Laundry-to-landscape, simple systems, or more complex installations based on customer preference and site feasibility.
3. **Recycled Water:** Utilizing recycled water for site irrigation where available.

In evaluating the proposed amendments to water conservation regulations, it is imperative to strike a balance between ensuring new construction meets efficiency standards while considering the financial implications for customers. A comprehensive financial assessment has been conducted to evaluate the incremental costs associated with compliance with these regulations:

Drought Tolerant Landscaping: The estimated customer cost for installing a 500 square foot area of drought-tolerant landscaping ranges from \$1,000 to \$4,000. It's worth noting that landscaping is typically completed as part of a remodel or new connection, and these costs may already be incurred by the customer outside of code compliance. There is no special maintenance required for the landscape area, which would yield a potential water savings of 3,700 to to 14,000 gallons per year.

Graywater Systems: Costs for a graywater system vary depending on system complexity, ranging from \$1,500 for a laundry-to-landscape system to over \$16,000 for a comprehensive, full-home system. This option allows interested customers to comply with the code while having on-site graywater available for irrigation. Maintenance required for graywater systems varies based on the type of system. The lowest tech system necessitates meeting plumbing code standards, including clearing emitters and maintaining mulch basins to prevent ponding.

Water savings from graywater systems range from 4,400 to 29,200 gallons per year, depending on the type of system.

Recycled Water: There is no additional cost to the customer if recycled water is available on-site, providing a cost-effective option for irrigation.

One method for updating the code could be to allow any of the above options to meet the regulatory requirement. Based on staff experience with compliance with the graywater regulation the option that will provide the most water savings would be to focus on low water use landscape installations. The regulation could be focused on new connections/construction, while allowing current customers to limit their lawn area to 25% per the State MWELO.

The financial assessment demonstrates that low water landscaping is a viable option for customers to achieve compliance with water conservation regulations without imposing undue financial burden. This proposal ensures that new construction projects can be as efficient as possible while accommodating the diverse needs and circumstances of our community.

FIXTURE CODE CHANGES

Background

The District's commitment to establishing and updating fixture standards dates back to 1990, with subsequent revisions occurring regularly, culminating in the most recent update in 2009. However, the landscape of environmental standards has evolved significantly since then. In particular, the State of California has transitioned many voluntary green building standards into mandatory requirements through the CALGreen Building Standards Code, which came into effect in January 2011. This code, updated every three years, mandates that new construction projects in California adhere to sustainable construction practices. The most recent revision of CALGreen was implemented in January 2023.

The proposed changes to the District's code represent a proactive step towards aligning with these evolving state standards. By removing our current, outdated fixture standards and adopting a reference to the CALGreen requirements, we ensure that our regulations remain up-to-date and in harmony with statewide sustainability initiatives. This strategic move not only streamlines regulatory compliance but also eliminates the need for manual updates, as District standards will automatically align with CALGreen standards every three years, without requiring additional action.

Moreover, the proposed changes offer flexibility for future adjustments. Should CALGreen standards ever be deemed inadequate or insufficient for our specific needs, the District retains the ability to consider implementing bespoke requirements for fixture standards. This ensures

that we maintain the ability to tailor regulations to our local context while leveraging the comprehensive framework provided by CALGreen.

In addition, the proposed changes to the Commercial Kitchen Equipment Specifications serve to clarify our standards while ensuring alignment with CALGreen. This focused approach retains only those fixture standards that are not covered by CALGreen, eliminating redundancy and ensuring clarity for stakeholders in the commercial sector.

In summary, adopting the proposed changes to our fixture standards represents a forward-thinking approach that demonstrates our commitment to environmental sustainability. By seamlessly integrating with statewide initiatives like CALGreen, we position ourselves at the forefront of sustainable development while retaining the flexibility to address our unique local needs in the future.

Proposed Revised Code

13.02.021 Water Conservation: Normal Year Water Conservation.

(3) Requirements for All Services.

B. Interior Plumbing Fixtures. All plumbing installed, replaced or moved in any new or existing service shall ~~meet the current CALGreen Tier 1 requirements. be high efficiency fixtures and shall meet the following minimum requirements:~~

- ~~1. *High Efficiency Clothes Washers:* Residential or commercial clothes washers that meet the current highest water efficiency standards as defined by the District. The General Manager shall have authority to grant a variance from the requirements of this section based upon financial hardship.~~
- ~~2. *High Efficiency Lavatory Faucet:* The maximum flow rate shall not exceed 1.0 gallons per minute (gpm) at a pressure of 60 pounds per square inch (psi) at the inlet, when water is flowing.~~
- ~~3. *High Efficiency Shower Head:* The manufacturer shall specify a maximum flow rate equal to or less than 2.0 gallons per minute (gpm), at a pressure of 60 pounds per square inch (psi) at the inlet, when water is flowing.~~
- ~~4. *High Efficiency Toilet:* Any WaterSense listed toilet rated at an effective flush volume of no greater than 1.28 gallons.~~
- ~~5. *High Efficiency Urinal:* The average water consumption shall not exceed 0.25 gallons per flush (gpf).~~

(4) Nonresidential Interior Plumbing Fixtures. All plumbing installed, moved or replaced in any new or existing service shall ~~meet the current CALGreen Tier 1 requirements. be high efficiency fixtures and shall meet the following minimum requirements:~~

A. ~~Faucets.~~ ~~Lavatory faucets, other than public lavatory or metering faucets, shall deliver 1.0 gallons, or less of water per minute.~~

- ~~1. *Metered Faucets.* Self-closing or self-closing metering faucets shall be installed on lavatories intended to serve the transient public, such as those in, but not limited to, service stations, train stations, airports, restaurants, and convention halls. Metered faucets shall~~

deliver no more than 0.25 gallons of water per use. Self-closing faucets shall deliver no more than 0.5 gallon per minute.

2. ~~Public lavatory (other than metering) faucets shall deliver 0.5 gallons, or less, of water per minute.~~

3. ~~Kitchen, bar and utility/service (other than hand washing sinks) faucets shall by default deliver 1.8 gallons per minute or less, and may be constructed to allow a temporary flow of 2.2 gallons, or less, of water per minute.~~

Commercial Kitchen Equipment Specifications.

1. ~~Dishwashers.~~ Dishwashers are machines designed to clean and sanitize plates, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution (with or without blasting media granules) and a sanitizing final rinse. Dishwashers shall meet the current specifications set by the Consortium for Energy Efficiency's (CEE) "High Efficiency Specifications for Commercial Dishwashers" and any and all amendments thereto.

2. ~~Steamers.~~ A "steamer" or "steam cooker" is a device with one or more food steaming compartments in which the energy in the steam is transferred to the food by direct contact. Steamers shall meet the current specifications set by the CEE's "High Efficiency Specifications for Commercial Steamers" and any and all amendments thereto.

3. ~~Pre Rinse Spray Valves.~~ Pre-rinse valves use a spray of water to remove food waste from dishes prior to cleaning in a dishwasher. Pre-rinse spray valves shall (1) deliver 1.3 gallons, or less, of water per minute based on tested performance by the FSTC and (2) meet the cleaning performance standard of 26 seconds per plate or less, based on the ASTM "Standard Test Method for Performance of Pre-Rinse Spray Valves" and any and all amendment thereto.

4. ~~Dipper Wells.~~ A "dipper well" is a basin into which clean tap water flows constantly to provide a fresh supply of water for soaking utensils. The run-off goes down the drain. Dipper well flow rate shall be 0.3 gallon, or less, per minute.

5. ~~Ice Machines.~~ Ice machines are a factory-made assembly (not necessarily shipped in one package) consisting of a condensing unit and ice-making section operating as an integrated unit, with means for making and harvesting ice. It is an assembly that makes up to 4,000 lbs. of ice per day at Standard Ratings Conditions, as defined in Section 5.2.1 of ARI Standard 810-2006, and may also include means for storing or dispensing ice, or both. Ice machines shall (1) be Energy Star qualified and (2) meet the current highest Tier specification set by the CEE's "High Efficiency Specifications for Air-Cooled Ice Machines" and any and all amendments thereto.

6. Heating, Ventilation and Air Conditioning (HVAC) Equipment. HVAC equipment shall eliminate all once-through cooling, replacing with an air-cooled system or a cooling tower. ~~For cooling towers, the following are recommended:~~

~~(a) Flow submeters on make-up and bleed-off lines; submeters should, at a minimum, be capable of totaling the flow.~~

~~(b) Conductivity controllers that activate the blowdown valve for dissolved solids control.~~

~~(c) Overflow sensors on the overflow pipes.~~

~~(d) Baffles or drift eliminators.~~

All cooling towers shall be monitored and maintained in a manner consistent with applicable regulatory guidelines and manufacturers recommendations.

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Appendix D

Marin Municipal Water District Code

Title 13. Water Service Conditions and Water Conservation Measures

Chapter 13.02. WATER CONSERVATION AND DRY YEAR WATER USE REDUCTION PROGRAM

Note: Prior ordinance history: Ords. 279, 286, 290 and 314.

§ 13.02.010. Declaration of purpose.

The purpose of this chapter is to provide a water conservation plan to minimize the effect of a shortage of water on the district's consumers and to adopt provisions that will significantly reduce the consumption of water during an extended dry weather period (drought), thereby extending the available water for the district's consumers while reducing the hardship on the general public to the greatest extent possible, voluntary conservation efforts having proved insufficient to achieve these ends. The programs developed in this chapter are triggered based on lake storages developed by computer simulations performed utilizing the district's seven reservoirs with approximately 80,000 acre-feet of total capacity and up to 9,000 acre-feet per year of imported water.

(Ord. 316 §2, 1991; Ord. 387 §1, 1999)

§ 13.02.015. Declaration of Water Shortage Emergency.

Nothing in this chapter shall preclude the district from declaring a water shortage emergency, which it may consider and adopt in accordance with **Water Code** Sections 350 et seq. and 71640 et seq.

(Ord. 462 §2, 2023)

§ 13.02.020. Water waste prohibitions.

No customer of the district shall make, cause, use or permit the use of potable water from the district for residential, commercial, industrial, agricultural, governmental or any other purpose in a manner contrary to any provision of this section.

(1) **Prohibited Nonessential Uses Applicable to Customers.** It is unlawful for any person, firm, partnership, association, corporation, or political entity to use potable water from the district for the following nonessential uses:

(A) The washing of sidewalks, walkways, driveways, parking lots and all other hard surfaced areas by direct hosing, except as may be permitted by current regulations pertaining to urban water runoff pollution prevention as defined by the Marin County Stormwater Pollution Prevention Program and other controlling agencies.

(B) The escape of water through breaks or leaks within the consumer's plumbing or private distribution system for any substantial period of time within which such break or leak should reasonably have been discovered and corrected. It shall be presumed that a period of 48 hours after the consumer discovers such a leak or break, or receives notice from the district of such leak or break, whichever occurs first, is a reasonable time within which to correct such leak or break.

- (C) Non-recycling decorative water fountains.
 - (D) Restrictions on Irrigation. Irrigation shall not be conducted in a manner or to an extent that allows water to run off or overspray the areas being watered. Every consumer is required to have his or her water distribution lines and facilities under control at all times to avoid water waste.
 - (E) Any excess water runoff flowing onto the public right-of-way at a rate of one gallon per minute or greater not caused by storm water or naturally occurring groundwater, is prohibited.
 - (F) Using a garden hose without a shut-off nozzle.
 - (G) Landscape irrigation between the hours of 9:00 a.m. and 7:00 p.m.
 - (H) Operating outdoor sprinkler irrigation systems delivering overhead spray more than two days within any calendar week and drip irrigation more than three days per week within any calendar week, but excluding hand-watering. For the purpose of this section, "calendar week" shall mean a period running from Monday-Sunday.
 - (I) The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall.
 - (J) Irrigating ornamental turf on public street medians.
- (2) Restrictions on Reverse Osmosis Units. The installation of reverse osmosis water purifying systems not equipped with an automatic shutoff unit is prohibited.
- (3) The following are prohibited for new connections:
- (A) Single pass cooling systems for air conditioning or other cooling system applications unless required for health or safety reasons;
 - (B) Non-recirculating systems for conveyer carwash applications.
- (4) Exemption From Daytime Water Prohibition. Notwithstanding anything contained in this Title 13, testing and repairing irrigation systems for the purpose of eliminating water waste is permitted during the hours of 9:00 a.m. and 7:00 p.m.
- (5) Sewer cleaning/flushing should be done using recycled water when available without hauling by truck and whenever reasonably possible.
- (Ord. 461 §2, 2022)

§ 13.02.021. Water Conservation: Normal Year Water Conservation.

- (1) Declaration of Purpose. The purpose of this chapter is to provide a water conservation plan to maximize the water supply during periods of relatively normal rainfall and to minimize the effect of a shortage of water on the district's consumers during an extended dry weather period (drought). The normal year conservation programs in this chapter are based on industry standards promulgated by the American Rainwater Catchment Systems Association (ARCSA), Bay-Friendly Landscape and Gardening Practices (Bay-Friendly), Best Management Practices developed by the California Urban Water Conservation Council (CUWCC), California Department of Water Resources (DWR), California Invasive Plant Council (Cal-IPC), California Irrigation Management Information System (CIMIS), Consortium for Energy Efficiency (CEE), University of California Cooperative Extension (U.C. Extension), USEPA Water-Sense Program (WaterSense), Water Use Classification of Landscape Species (WUCOLS), and other recognized conservation industry standards. In every case, the intent of this chapter is to remain a living document, incorporating the most restrictive industry standards in practice at the time in question. In the event that there is a conflict in regulations, the default shall be determined by the District, or as required by law.

Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall

not extend to waste or unreasonable method of use. This policy protects local water supplies through the implementation of a whole systems approach to design, construction, installation and maintenance of the landscape resulting in water conserving climate-appropriate landscapes, improved water quality and the minimization of natural resource inputs.

(2) Definitions. Definitions used in this chapter are as follows:

Aggregate Landscape Area: The total square foot area of new or rehabilitated landscape subject to plan review.

Applied Water: The portion of water supplied by the irrigation system to the landscape.

Application for Service from an Existing Connection: The application for service from an existing connection, whether it is a new, increased, or modified water service, in a customer's name for a property.

Automatic Irrigation Controller: A device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers are able to self-adjust and schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

Backflow Prevention Device: An approved device installed to District standards which will prevent backflow or back-siphonage into the potable water system.

Booster Pumps: A water pump used where the normal water system pressure is low and needs to be increased.

Bubblers: Irrigation heads that produce a large volume of output, measured in gallons per minute (gpm) that flood the soil area surrounding the bubbler head.

Check Valve or Anti-Drain Valve: A valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

Common Interest Development: Community apartment projects, condominium projects, planned developments, and stock cooperatives per **Civil Code** Section 1351.

Compost: The decayed remains of organic matter that has rotted into a natural fertilizer suitable as a soil amendment to enhance plant growth.

Conversion Factor (0.62): The number that converts acre-inches per acre per year to gallons per square foot per year.

Developed Landscape Area: All outdoor areas under irrigation, swimming pools, and water features, but excluding hardscape areas.

Distribution Uniformity: The measure of the uniformity of irrigation water over a defined area.

Drip Irrigation: Any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

Ecological Restoration Project: A project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

Effective Precipitation (Eppt): The portion of total rainfall which becomes available for plant growth and that is used by the plants, defined as an average of 25% of total rainfall.

Emitter: A drip irrigation device that delivers water slowly from the system to the soil.

Established Landscape: The point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

Estimated Total Water Use (ETWU): A calculated amount of water needed to irrigate a given landscape, and used as the basis for assigning water budgets at a site.

ET Adjustment Factor (ETAF): A factor of 0.55 for residential areas and 0.45 for non-residential areas, that, when applied to reference evapotranspiration as measured by a CIMIS weather station, or equivalent, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. The ETAF for new and existing (non-rehabilitated) Special Landscape Areas shall not exceed 1.0. The ETAF for existing non-rehabilitated landscapes is 0.8.

Evapotranspiration Rate: The quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specific specified time.

Flow Rate: The rate at which water flows through pipes, and valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

Flow Sensor: An inline device installed at the supply point of the irrigation system that produces a repeatable signal proportional to flow rate. Flow sensors must be connected to an automatic irrigation controller, or flow monitor capable of receiving flow signals and operating master valves. This combination flow sensor/controller may also function as a landscape water meter or submeter.

Friable: A soil condition that is easily crumbled or loosely compacted down to a minimum depth per planting material requirements, whereby the root structure of newly planted material will be allowed to spread unimpeded.

Graywater: Untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. Graywater includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

Hardscape: Impermeable areas including patios, decks and paths, driveways and sidewalks.

Head-to-Head Coverage: A high-flow irrigation system designed to provide an irrigation spray pattern that delivers water from one sprinkler head to the next.

High-Efficiency Fixture(s): High efficiency fixtures shall, at a minimum, meet the current requirements of the WaterSense labeling program and those of the California Department of Water Resources and the District.

High-Efficiency Irrigation Controller: An electronic device that controls the amount of time and frequency of operation for an irrigation system and adjusts automatically to compensate for the seasonal plant water requirements at the site (commonly referred to as weather-based irrigation controllers).

High-Efficiency Irrigation System: An irrigation system connected to a water service where the overall distribution uniformity (how evenly water is distributed across the irrigated landscape area) is a minimum of 75% for overhead spray devices and 85% for drip and bubbler systems, and the volume of water used is consistent with seasonal plant requirements as defined by the District.

High Volume Irrigation: An irrigation device or system that delivers water to the landscape in a spray, stream-like, or flooding manner from above-ground irrigation nozzles with output expressed in gallons per minute (including many bubblers and micro-spray devices).

High-Flow Sensor: A device for sensing the rate of flow in the irrigation system.

High-Water-Use Plants: Annuals, plants in containers, and plants identified as high-water-use in the current edition of the WUCOLS list published by the U.C. Extension. High-water-using plants are characterized by high transpiration rates, shallow rooting, the need for frequent watering during summer months or with exposure to hot and drying climatic conditions.

Hydrozones: A distinct grouping of plants with similar water needs and climatic requirements. Hydrozone types include, but are not limited to, turf, high-water-use plants, low-water-use plants, microclimates (i.e., sun or shade, southern or northern exposures, surrounded by highly reflective surfaces), and partially hardscaped areas with plants, pool areas and water-use features.

Infiltration Rate: The rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

Invasive Plant Species: Species of plants not historically found in California and/or that spread outside cultivated areas and can damage environmental or economic resources as determined by Cal-IPC (www.cal-ipc.org) and the District.

Irrigation Design Capacity: The maximum amount of water calculated to flow through an irrigation system, or section of a system, based on pipe size, pipe material, and operating pressure.

Irrigation Efficiency (IE): A calculated measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The irrigation efficiency for purposes of this chapter is 0.75 for overhead spray devices and 0.85 for drip and bubbler systems.

Isolation Valves: Used to isolate and shut-off water to a portion of the piping system.

Landscape Agent: The consumer's designated representative for interacting with the District on landscape plan reviews.

Landscape Area: All the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

Landscape Plans: This includes a planting plan, an irrigation plan, and a grading plan drawn at the same scale and that clearly and accurately identify specified plants, irrigation layout, equipment, finish grades and drainage, specifications and construction details, plan sheet numbers, and drawing date of plans.

Landscape Project: Total area of landscape in a project as defined in "landscape area."

Landscape Water Budget: The amount of water allowed for landscape water use at a site, adjusted on a seasonal basis, as determined by the District.

Landscape Water Meter: An inline device installed at the irrigation supply point that measures the flow of water into the irrigation system and is connected to a totalizer to record water use.

Lateral Line: Non-pressurized pipe that is located downstream of an irrigation valve.

Low-Head Drainage: Water that flows out of the system after the valve turns off due to elevation changes within the system.

Low Volume Irrigation: Irrigation devices, commonly called drip or point-source irrigation, with output measured and typically expressed in gallons per hour (gph), that apply water directly to soil in the

plants' root zone.

Low-Water-Use Plants: Plants identified as low-water-use in the current edition of the Water Use Classification of Species list published by the U.C. Extension. (Typically, plants that once established can survive on two irrigations per month during the summer months).

Main Line: The pressurized pipeline that delivers water from the water source to the valve or outlet.

Master Valve: An automatic valve installed at the irrigation supply point which controls water flow into the irrigation system. When this valve is closed water will not be supplied to the irrigation system. A master valve will greatly reduce any water loss due to a break, leak, or other malfunction in the irrigation system.

Maximum Applied Water Allowance (MAWA): For design purposes, the upper limit of annual applied water for the established landscape as determined by the District.

Median: An area between opposing lanes of traffic that may be unplanted or planted.

Microclimate: The climate of a specific area in the landscape that has substantially differing sun exposure, temperature, or wind, or proximity to reflective surfaces than adjacent areas or the area as a whole.

Moderate Water Use Plants: Ornamental trees, shrubs, ground covers, and perennials and other plants recognized as moderate-water-use by WUCOLS.

Mulch: Any organic material such as leaves, bark, straw, compost or other inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature and preventing soil erosion.

New Construction: Any new landscape area such as a planter, lawn, swimming pool, park, playground, or greenbelt with or without a new building associated with the project.

Nonfunctional Turf: Any turf planted within nonresidential landscapes, excluding recreational areas, and other areas where the turf is necessary for the intended function of the planted area and no alternative materials are suitable for the anticipated site use.

Nonresidential Landscape: Landscapes in commercial, institutional, industrial and public settings that may have areas designated for recreation or public assembly. It also includes portions of common areas of common interest developments, such as home owners associations, with designated recreational areas.

Operating Pressure: The pressure when water is flowing through the irrigation system.

Overhead Sprinkler Irrigation Systems or Overhead Spray Irrigation Systems: Systems that deliver water through the air (e.g., spray heads, microspray, multi-stream rotating nozzles and rotors).

Overspray: Water delivered by an irrigation system outside the targeted landscape area during average operating conditions onto any adjacent hardscapes or other nonlandscaped areas during an irrigation cycle.

Pervious: Any surface or material that allows the passage of water through the material and into the underlying soil.

Plant Factor: A factor specified in WUCOLS that, when multiplied by reference evapotranspiration (ET_o), estimates the amount of water used by specified plants.

Point of Connection (POC): The location where an irrigation system is connected to water supply.

Precipitation Rate: The rate of application of water measured in inches per hour.

Pressure Regulating Valve: A valve that automatically reduces the pressure in a pipe.

Project Applicant: The individual or entity submitting a Landscape Documentation Package, to request a permit, plan check or design review from the local agency. A project applicant may be the property owner or his or her designee.

Property: Any structure, including, but not limited to, single-family residential, multi-family residential and floating homes, built and/or intended primarily for sheltering or housing of any person and ancillary structures thereto.

Property Owner: A person or entity that owns or has the financial authority or control over the property to comply with the requirements set forth in this chapter.

Rain Sensor: A system component which automatically shuts off and suspends the irrigation system when it rains.

Recreational Area: Areas dedicated to active play or recreation such as sports fields, school yards, picnic grounds, or other areas with intense foot traffic, parks, sports fields and golf courses where turf provides a playing surface.

Recycled Water: Tertiary treated water which results from the treatment of wastewater, is suitable for direct beneficial use, and conforms to the definition of disinfected tertiary recycled water in accordance with state law.

Reference Evapotranspiration or ETo: A standard measurement of environmental parameters which affect the water use of plants and are an estimate of the evapotranspiration of a large field of four to seven-inch tall, cool-season grass that is well watered.

Rehabilitated Landscape: Any re-landscaping project that requires a building or grading permit, plan check or design review.

Residential Customer: The person(s) or entity with an existing water service connection for a residential property.

Residential Landscape: Landscapes surrounding single-family or duplex homes.

Runoff: Irrigation water that is not absorbed by the soil or landscape area to which it is applied and which flows onto other non-targeted areas, including runoff into storm drain systems.

Soil Moisture Sensing Device or Soil Moisture Sensor: A device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

Soil Texture: The classification of soil based on its percentage of sand, silt, and clay.

Soils Laboratory Report: The analysis of a soil sample to determine nutrient content, composition and other characteristics, including contaminants, for horticultural purposes.

Special Landscape Area (SLA): An area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.

Sprinkler Head: A high-volume irrigation device that delivers water to the landscape through a spray nozzle.

Static Water Pressure: The pipeline or municipal water supply pressure when water is not flowing.

Station: An area served by one valve or by a set of valves that operate simultaneously.

Submeter: A separate meter that is located on the private side of the water system and is plumbed to measure all water that flows only through the irrigation system. This meter is to be used by the owner to monitor irrigation water use and will not be read or maintained by the District.

Swing Joint: An irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

Turf: A mat layer of monocotyledonous plants with shallow rooting structures requiring frequent watering during the growing season; i.e., cool or warm season grass consisting of, but not limited to, Blue, Rye, Fescue, Bent, Bermuda, Kikuyu, St. Augustine, Zoysia, and Buffalo.

Valve: A device used to control the flow of water in the irrigation system.

Valve Manifold: A one-piece manifold for use in a sprinkler valve assembly that includes an intake pipe having a water inlet and a plurality of ports adapted for fluid connection to inlets.

Water Budget: An allocation of water based on plant water needs, used to determine the billing tiers for customers with dedicated landscape irrigation meters, for example.

Water Feature: A design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area.

Watering Window: The time of day irrigation is allowed.

Weather-Based or Sensor-Based Irrigation Control Technology: Local weather and landscape conditions to tailor irrigation schedules to actual conditions on the site or uses historical weather data.

WUCOLS: The most current Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation.

(3) Requirements for All Services.

- A. Pressure Regulation. A pressure-regulating valve shall be installed and maintained by the consumer if static service pressure exceeds 80 pounds per square inch (psi), and be set at a maximum operating pressure of 60 psi at the regulator outlet. The pressure-regulating valve shall be located between the meter and the first point of water use, or first point of division in the pipe, and pressure-relief valves and other plumbing safety devices shall be installed as required by local codes. The operating pressure requirement may be waived if the consumer presents evidence satisfactory to the District that high pressure is necessary in the design and that no water will be wasted as a result of higher pressure operation.
- B. Interior Plumbing Fixtures. All plumbing installed, replaced or moved in any new or existing service shall be high-efficiency fixtures and shall meet the following minimum requirements:
 1. *High-Efficiency Clothes Washers*: Residential or commercial clothes washers that meet the current highest water efficiency standards as defined by the District. The General Manager shall have authority to grant a variance from the requirements of this section based upon financial hardship.
 2. *High-Efficiency Lavatory Faucet*: The maximum flow rate shall not exceed 1.0 gallons per minute (gpm) at a pressure of 60 pounds per square inch (psi) at the inlet, when water is flowing.

3. *High-Efficiency Shower Head*: The manufacturer shall specify a maximum flow rate equal to or less than 2.0 gallons per minute (gpm), at a pressure of 60 pounds per square inch (psi) at the inlet, when water is flowing.
 4. *High-Efficiency Toilet*: Any WaterSense listed toilet rated at an effective flush volume of no greater than 1.28 gallons.
 5. *High-Efficiency Urinal*: The average water consumption shall not exceed 0.25 gallons per flush (gpf).
- C. Pool and Spa Covers. All recreational pools and spas shall have covers, subject to the variance provisions as set forth in Section **13.02.050**.
- (4) Nonresidential Interior Plumbing Fixtures. All plumbing installed, moved or replaced in any new or existing service shall be high-efficiency fixtures and shall meet the following minimum requirements:
- A. Faucets. Lavatory faucets, other than public lavatory or metering faucets, shall deliver 1.0 gallons, or less of water per minute.
1. *Metered Faucets*. Self-closing or self-closing metering faucets shall be installed on lavatories intended to serve the transient public, such as those in, but not limited to, service stations, train stations, airports, restaurants, and convention halls. Metered faucets shall deliver no more than 0.25 gallons of water per use. Self-closing faucets shall deliver no more than 0.5 gallon per minute.
 2. *Public lavatory (other than metering) faucets* shall deliver 0.5 gallons, or less, of water per minute.
 3. *Kitchen, bar and utility/service (other than hand-washing sinks) faucets* shall by default deliver 1.8 gallons per minute or less, and may be constructed to allow a temporary flow of 2.2 gallons, or less, of water per minute.
- B. Private Use, Public Use. Pursuant to the International Plumbing Code (IPC):
- In the classification of plumbing fixtures, 'private' applies to fixtures in residences and apartments, and to fixtures in nonpublic toilet rooms of hotels and motels and similar installations in buildings where the plumbing fixtures are intended for utilization by a family or an individual; 'public' applies to fixtures in general toilet rooms of schools, gymnasiums, hotels, airports, bus and railroad stations, public buildings, bars, public comfort stations, office buildings, stadiums, stores, restaurants and other installations where a number of fixtures are installed so that their utilization is similarly unrestricted.
- C. Commercial Equipment Specifications.
1. *Dishwashers*. Dishwashers are machines designed to clean and sanitize plates, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution (with or without blasting media granules) and a sanitizing final rinse. Dishwashers shall meet the current specifications set by the Consortium for Energy Efficiency's (CEE) "High Efficiency Specifications for Commercial Dishwashers" and any and all amendments thereto.
 2. *Steamers*. A "steamer" or "steam cooker" is a device with one or more food steaming compartments in which the energy in the steam is transferred to the food by direct contact. Steamers shall meet the current specifications set by the CEE's "High Efficiency Specifications for Commercial Steamers" and any and all amendments thereto.
 3. *Pre-Rinse Spray Valves*. Pre-rinse valves use a spray of water to remove food waste from dishes prior to cleaning in a dishwasher. Pre-rinse spray valves shall (1) deliver 1.3 gallons, or less, of water per minute based on tested performance by the FSTC and (2) meet the cleaning performance standard of 26 seconds per plate or less, based on the ASTM "Standard Test Method for Performance of Pre-Rinse Spray Valves" and any and all amendment thereto.

4. *Dipper Wells.* A "dipper well" is a basin into which clean tap water flows constantly to provide a fresh supply of water for soaking utensils. The run-off goes down the drain. Dipper well flow rate shall be 0.3 gallon, or less, per minute.
5. *Ice Machines.* Ice machines are a factory-made assembly (not necessarily shipped in one package) consisting of a condensing unit and ice-making section operating as an integrated unit, with means for making and harvesting ice. It is an assembly that makes up to 4,000 lbs. of ice per day at Standard Ratings Conditions, as defined in Section 5.2.1 of ARI Standard 810-2006, and may also include means for storing or dispensing ice, or both. Ice machines shall (1) be Energy Star qualified and (2) meet the current highest Tier specification set by the CEE's "High Efficiency Specifications for Air-Cooled Ice Machines" and any and all amendments thereto.
6. *Heating, Ventilation and Air Conditioning (HVAC) Equipment.* HVAC equipment shall eliminate all once-through cooling, replacing with an air-cooled system or a cooling tower. For cooling towers, the following are recommended:
 - (a) Flow submeters on make-up and bleed-off lines; submeters should, at a minimum, be capable of totaling the flow.
 - (b) Conductivity controllers that activate the blowdown valve for dissolved solids control.
 - (c) Overflow sensors on the overflow pipes.
 - (d) Baffles or drift eliminators.

All cooling towers shall be monitored and maintained in a manner consistent with applicable regulatory guidelines and manufacturers recommendations.

(5) Water Efficient Landscaping.

A. After December 1, 2015, this chapter shall apply to all of the following:

1. New construction projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check or design review;
2. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 1,000 square feet requiring a building or landscape permit, plan check, or design review;
3. Any project with an aggregate landscape area of less than 1,000 square feet requiring a building or landscape permit, plan check, or design review shall comply with the performance requirements of this ordinance or conform to the prescriptive measures contained in Appendix D.

B. This chapter shall not apply to:

1. Registered local, state or federal historical sites;
2. Ecological restoration projects that do not require a permanent irrigation system;
3. Mined-land reclamation projects that do not require a permanent irrigation system; or
4. Existing plant collections, as part of botanical gardens and arboretums open to the public.

Note: Authority Cited: Section 65595, **Government Code**. Reference: Section 65596, **Government Code**.

C. Water Efficient Landscape Worksheet.

1. Complete the Maximum Applied Water Allowance and Estimated Total Water Use worksheet in Appendix A.

2. Water budget calculations shall adhere to the following requirements:

- (a) The plant factor used shall be from WUCOLS or from horticultural researchers with academic institutions or professional associations as approved by the California Department of Water Resources (DWR).
- (b) All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.
- (c) All Special Landscape Areas shall be identified and their water use calculated as shown in Appendix A.
- (d) ET Adjustment Factor for new and existing (non-rehabilitated) Special Landscape Areas, and for areas exclusively irrigated with recycled water, rainwater, or graywater, shall not exceed 1.0.

D. Soil Management Report.

1. In order to reduce runoff and improve plant growth, the project applicant may be required by the District to complete a soil management report as follows:

- (a) Submit soil samples to a laboratory for analysis and recommendations.
- (b) Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.
- (c) The soil analysis may include:
 - i. Soil texture;
 - ii. Infiltration rate determined by laboratory test or soil texture infiltration rate table;
 - iii. pH;
 - iv. Total soluble salts;
 - v. Sodium;
 - vi. Percent organic matter; and
 - vii. Recommendations.

E. Landscape Design Plan. For each landscape project subject to this chapter applicants shall submit a landscape design plan in accordance with the following:

1. The landscape design plan, at a minimum, shall:

- (a) Delineate and label each hydrozone by number, letter, or other method;
- (b) Identify each hydrozone as low, moderate, high water. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;
- (c) Identify recreational areas;
- (d) Identify areas permanently and solely dedicated to edible plants;
- (e) Identify areas irrigated with recycled water;
- (f) Identify type of mulch and application depth;
- (g) Identify soil amendments, type, and quantity;
- (h) Identify type and surface area of water features;

- (i) Identify hardscapes (pervious and non-pervious);
- (j) Identify location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Appropriate stormwater best management practices are encouraged in the landscape design.
- (k) Identify any applicable rain harvesting or catchment technologies.
- (l) Identify any applicable graywater discharge piping, system components and area(s) of distribution;
- (m) Contain the following statement: "I have complied with the criteria of the ordinance and applied them for the efficient use of water in the landscape design plan"; and
- (n) Bear the signature of a licensed landscape architect, licensed landscape contractor, or other person authorized by the property owner to design the project's landscape.

F. Soil Preparation, Mulch and Amendments.

- 1. Prior to the planting of any materials, compacted soils shall be transformed to a friable condition. On engineered slopes, only amended planting holes need meet this requirement.
- 2. Soil amendments shall be incorporated according to what is appropriate for the plants selected.
- 3. For landscape installations, compost at a rate of a minimum of six cubic yards per 1,000 square feet of permeable area shall be incorporated to a depth of eight inches into the soil. Soils with greater than 6% organic matter in the top 8 inches of soil, as determined by a soil management report, are exempt from adding compost and tilling.
- 4. A minimum three-inch (3") layer of organic mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated. To provide habitat for beneficial insects and other wildlife, up to 5% of the landscape area may be left without mulch. Designated insect habitat must be included in the landscape design plan as such.
- 5. Stabilizing mulching products shall be used on slopes that meet current engineering standards.
- 6. The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.
- 7. Organic mulch materials made from recycled or post-consumer products are preferred over virgin forest products unless the recycled post-consumer organic products are not locally available.

G. Plants.

- 1. Any plant may be selected for the landscape, providing the Estimated Total Water Use in the landscape area does not exceed the Maximum Applied Water Allowance and the selected plants meet all other permit, fire safe, and non-invasive requirements for the project. Methods to achieve water efficiency shall include the following:
 - (a) Protection and preservation of native species and natural vegetation;
 - (b) Selection of water-conserving plant, tree and turf species, especially local native plants;
 - (c) Selection of plants based on local climate suitability, disease and pest resistance;

- (d) Selection of trees based on applicable local tree ordinances or tree shading guidelines, and size at maturity as appropriate for the planting area; and
- (e) Selection of plants from local and regional landscape program plant lists.
- (f) Plants with similar water use needs shall be grouped together in distinct hydrozones, and where irrigation is required the distinct hydrozones shall be irrigated with separate valves.
- (g) Low and moderate water use plants can be mixed, but the entire hydrozone will be classified as moderate water use for MAWA calculations.
- (h) High water use plants shall not be mixed with low or moderate water use plants.
- (i) Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. Methods to achieve water efficiency shall include one or more of the following:
 - i. Use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;
 - ii. Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure (e.g., buildings, sidewalks, power lines); allow for adequate soil volume for healthy root growth; and
 - iii. Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.
- (j) Turf shall not be allowed in the following conditions: Slopes exceeding 10%, planting areas 10 feet wide or less, street medians, traffic islands, planter strips adjacent to hardscape, bulbouts or parkways, unless the parkway is adjacent to a parking strip and used to enter and exit vehicles. Any turf in parkways must be irrigated by sub-surface irrigation or by other technology that creates no overspray or runoff.
- (k) High-water-use plants, characterized by a plant factor of 0.7 to 1.0, are prohibited in street medians, traffic islands, planter strips adjacent to hardscape, or bulbouts of any size.
- (l) Invasive plants as listed by the Cal-IPC are prohibited. Weedy species, listed as invasive in California (at www.cal-ipc.org/ip/inventory/index.php) shall not be planted. Please check the species you might be thinking of planting against these lists, broken out by plant type. Exemptions may be granted on a case by case basis if District staff determine that the proposed location, species, size, number of plants, and other cultural methods are not likely to cause harm to the watershed ecosystem.
- (m) Fire Safe Landscape Practices. The requirements in this chapter are intended to support, and be in compliance with, all local and State requirements related to Fire Safe Landscaping practices, including, but not limited to, requirements for Wildlife Urban Interface zones as specified by the local authority.
- (n) The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.
- (o) Nonfunctional turf irrigated with district water shall be prohibited.

H. Water Features.

1. Recirculating water systems shall be used for water features.

2. Where available, recycled water shall be used as a source for decorative water features.
 3. Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.
 4. Pool covers are required for all new outdoor swimming pools.
- I. Irrigation Design Plan. This section applies to landscaped areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers' recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package:
1. The irrigation design plan, at a minimum, shall contain:
 - (a) Location and size of separate water meters for landscape;
 - (b) Location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention assemblies;
 - (c) Static water pressure at the point of connection to the public water supply;
 - (d) Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;
 - (e) Recycled water irrigation systems;
 - (f) The following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan"; and
 - (g) The signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or other person authorized by the property owner to design the project's irrigation system.
 2. *System.*
 - (a) Separate District landscape water service meters shall be required for all new landscapes, other than single-family and two-unit residential landscapes, for which the irrigated area is equal to or greater than 1,000 square feet.
 - (b) A private submeter shall be required for all rehabilitated landscapes for which the irrigated landscape area is equal to or greater than 2,500 square feet.
 - (c) Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data utilizing non-volatile memory shall be required for irrigation scheduling in all irrigation systems.
 - (d) If the water pressure is below or exceeds the recommended pressure of the specified irrigation devices, the installation of a pressure regulating device(s) is required to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
 - (e) Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather or during rain.

- (f) Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply and before each valve or valve manifold, to minimize water loss in case of an emergency (such as a main line break) or routine repair.
- (g) Backflow prevention assemblies shall be required to protect the water supply from contamination by the irrigation system. A project applicant shall refer to the applicable local agency code (i.e., public health) for additional backflow prevention requirements.
- (h) Flow sensors that detect high flow conditions created by system damage or malfunction, are required for all non-residential landscapes and residential landscapes of 5,000 square feet or larger and shall be integrated with the irrigation system in such a manner as to be capable of automatically stopping water flow in the irrigation system in the event of a high flow condition. Flow sensors that meet this requirement are typically integrated with the irrigation controller(s) and master valve(s), and have the ability to alert the system operator of malfunctions using remote communication devices.
- (i) The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.
- (j) If applicable, relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
- (k) The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
- (l) The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency regarding the Maximum Applied Water Allowance.
- (m) It is highly recommended that the project applicant inquire with the District about water restrictions that may impact the effectiveness of the irrigation system.
- (n) In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.
- (o) Sprinkler heads and other emission devices shall have matched precipitation rates.
- (p) Sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
- (q) Swing joints or other pipe protection components are required on above-ground irrigation piping.
- (r) Check valves shall be installed to prevent low-head drainage.
- (s) Areas less than 10 feet in width in any direction shall be irrigated with subsurface irrigation or other means that produce no runoff or overspray.
- (t) Minimum 24" setback of overhead spray irrigation is required when adjacent to a continuous hardscape area where runoff water flows into the curb and gutter.
- (u) Slopes greater than 15% shall not be irrigated with an irrigation system with an application rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

- (v) Identify any applicable rain harvesting, graywater, or catchment technologies (e.g., rain gardens, cisterns, etc.). Applicants are encouraged to employ alternative irrigation techniques as appropriate, and where permitted by law.
- (w) Identify location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Appropriate stormwater best management practices are encouraged in the landscape design.

3. *Hydrozone.*

- (a) Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.
- (b) Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
- (c) Trees shall be placed on separate irrigation valves except when planted in turf areas.
- (d) Low and moderate water use plants can be mixed, but the entire hydrozone will be classified as moderate water use for MAWA calculations.
- (e) High water use plants shall not be mixed with low or moderate water use plants.
- (f) On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the Hydrozone Information Table. This table can also assist with the irrigation audit and programming the controller.

J. Certificate of Completion (Appendix C).

1. The Certificate of Completion shall include the following six elements:

- (a) Project information sheet that contains:
 - i. Date,
 - ii. Project name,
 - iii. Project applicant name, telephone, and mailing address,
 - iv. Project address and location, and
 - v. Property owner name, telephone, and mailing address;
- (b) Certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved Landscape Documentation Package.
 - i. Where there have been significant changes made in the field during construction, "as-built" or record drawings shall be included with the certification.
 - ii. A diagram of the irrigation plan showing hydrozones shall be kept with the irrigation controller for subsequent management purposes;
- (c) Irrigation scheduling parameters used to set the controller;
- (d) Landscape and irrigation maintenance schedule;
- (e) Irrigation audit report; and
- (f) Soil analysis report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations as required.

2. The project applicant shall:
 - (a) Submit the signed Certificate of Completion to the District for review;
 - (b) Ensure that copies of the approved Certificate of Completion are submitted to the property owner or his or her designee.
- K. Landscape and Irrigation Maintenance Schedule.
1. Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the Certificate of Completion.
 2. A regular maintenance schedule shall include, but not be limited to, routine inspection; auditing, adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; top dressing with compost, replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing obstructions to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
 3. Repair of all irrigation equipment shall be done with the originally installed components or their equivalents or with components with greater efficiency.
 4. A project applicant is encouraged to implement established landscape industry sustainable Best Practices for all landscape maintenance activities.
- L. Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis.
1. All landscape irrigation audits shall be conducted by a local agency landscape irrigation auditor or a third party certified landscape irrigation auditor.
 2. In large projects or projects with multiple landscape installations (i.e., production home developments) an auditing rate of 1 in 7 lots or approximately 15% will satisfy this requirement.
 3. For new construction and rehabilitated landscape projects installed after December 1, 2015, the project applicant shall submit an irrigation audit report with the Certificate of Completion to the District that may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting over-spray or run-off that causes overland flow, and preparation of an irrigation schedule, including configuring irrigation controllers with application rate, soil types, plant factors, slope, exposure and any other factors necessary for accurate programming.
- M. Irrigation Efficiency. For the purpose of determining Estimated Total Water Use, average irrigation efficiency is assumed to be a minimum of 0.75 for overhead spray de-vices and 0.85 for drip system devices.
- N. Recycled Water.
1. The installation of recycled water irrigation systems shall allow for the current and future use of recycled water.
 2. All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and State laws.
 3. Landscapes using recycled water are considered Special Landscape Areas. The ET Adjustment Factor for new and existing (non-rehabilitated) Special Landscape Areas shall not exceed 1.0.
- O. Graywater Systems. Graywater systems promote the efficient use of water and are encouraged to assist in on-site landscape irrigation. All graywater systems shall conform to the California Plumbing Code (Title 24, Part 5, Chapter 16) and any applicable local ordinance standards.
- P. Stormwater Management and Rainwater Retention.

1. Identify location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Appropriate stormwater best management practices are encouraged in the landscape design.
 2. Rain gardens, cisterns, and other landscapes features and practices that increase rainwater capture and create opportunities for infiltration and/or on-site storage are recommended.
- Q. Forms. The following forms shall be submitted: Appendix A, Maximum Applied Water Allowance; Appendix B, Hydrozone Table; Appendix C, Certificate of Completion; Appendix D, Prescriptive Compliance (Optional).

Appendix A – Maximum Applied Water Allowance

Appendix B – Hydrozone Table

Appendix C – Certificate of Completion

Appendix D – Prescriptive Compliance Option

- (6) Drinking Water Served Upon Request Only. By January 1, 2011, eating or drinking establishments, including, but not limited to, a restaurant, hotel, café, cafeteria, bar, or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.
- (7) Commercial Lodging Establishments Must Provide Guests Option to Decline Daily Linen Services. By January 1, 2011, hotels, motels and other commercial lodging establishments shall provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments shall prominently display notice of this option in each bathroom using clear and easily understood language.
- (8) Graywater Systems. All applicants requesting a water service for a new residential or commercial structure which requires the installation of a new service, and all applicants requesting an enlarged water service for a "substantial remodel" to an existing residential or commercial structure as that term is defined under Marin County Code Section 19.04.063 or any successor ordinance shall install a gray water recycling system to reuse the maximum practicable amount of gray water on site. Installation and operation of all gray water systems shall comply with all rules and regulations of the District, the local jurisdiction having zoning authority over the parcel and the California Plumbing and CALGreen Code.
- (9) Rainwater Harvesting Systems. This section is reserved for future provisions regarding rainwater harvesting systems.
- (10) Other Provisions. The General Manager will consider and may allow the substitution of design alternatives and innovation which may equally reduce water consumption for any of these requirements. The General Manager may accept documentation methods, water allowance determination, and landscape and irrigation design requirements of the State of California Model Water Efficient Landscape Ordinance instead of Sections 14-30.040 and 14-30.050 of these requirements where it can be demonstrated that the State procedure will more effectively address the design requirements of the project.
- (11) Provisions for Appeal. The applicant or any affected person may appeal the final decision of staff regarding plan check or final inspection to the General Manager. The decision of the General Manager shall be final. An appeal regarding plan check shall be submitted prior to the installation of the landscape or it will be deemed to have been waived.
- (12) Forms. The following forms shall be submitted as described in this chapter: Appendix A, Maximum Applied Water Allowance; Appendix B, Hydrozone Table; Appendix C, Certificate of Completion; Appendix D, Prescriptive Compliance Option (as required)

Appendix A—Maximum Applied Water Allowance (Residential & Commercial)

Appendix A- Maximum Applied Water Allowance (Residential & Commercial)

MARIN WATER
WATER BUDGET & WATER USE CALCULATOR

Zip Code:	
Date:	
Project Name:	
Project Address:	
Project Contact:	
Project Contact Email:	



Maximum Applied Water Allowance (MAWA)	Project Type	ET _o	ETAF	Special Landscape Area (SLA)	Total Landscape Area including SLA	MAWA (CCF/yr)
		-		-		-

Estimated Total Water Use (ETWU)	ET _o	(SF * PF) / IE	SLA	ETWU (CCF/yr)
	-	-	-	-

Project meets water budget.

Difference between MAWA and ETWU

ETWU Calculation (Regular landscape areas)	Zone #	Description	Select Irrigation	Square Feet (SF)	Plant Factor (PF)	Irrigation Efficiency (IE)	(SF * PF) / IE
	1						-
	2						-
	3						-
	4						-
	5						-
	6						-
	Landscape area (not including SLA)			-			-

ETWU Calculation Special Landscape Areas (SLA)	Description	Square Feet (SF)	Plant Factor / Irrigation Efficiency (PF/IE)	(SF * PF) / IE
	Edible planting area		1.0	-
	Multi-use and sports field turf area		1.0	-
	Area irrigated with recycled water		1.0	-
	Pool		1.0	-
	Total SLA	0		0

Total Landscape Area (including SLA) from ETWU Calculation

Water Use Table	ETWU	Gallons:	0	Units:	0	AF:	0
	Billing Period	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
	Baseline (CCF)	0	0	0	0	0	0

1 CCF (hundred cubic feet) = 748.05 gallons; 1 AF (acre foot) = 435.6 CCF

Appendix B—Hydrozone Table

Certificate of Completion

This certificate is filled out by the project applicant, landscape architect and landscape contractor upon completion of the landscape project.

Part 1. Project Information Sheet

Date:	MMWD Project Number:	
Project Name:	Project Address:	
Name of Project Applicant:	Telephone No.:	
	Fax No.:	
Title:	Email Address:	
Company:	Street Address:	
City:	State:	ZIP Code:

"I/we certify that I/we have received copies of all the documents within the Landscape Documentation Package and that it is our responsibility to see that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule."

Property Owner Signature

Date

Part 2. Landscape Architect and Landscape Contractor/Installer

Landscape Architect Name:	Telephone No.:	
	Fax No.:	
Title:	Email Address:	
License No. or Certification No.:	Street Address:	
Company:	City:	
	State:	ZIP Code:

Landscape Contractor Name:	Telephone No.:	
	Fax No.:	
Title:	Email Address:	
License No. or Certification No.:	Street Address:	
Company:	City:	
	State:	ZIP Code:

"I/we certify that the work has been completed in accordance with the ordinance and that the landscape planting and irrigation installation conform to the criteria and specifications of the approved Landscape Documentation Package. Additionally, a landscape audit and irrigation maintenance schedule have been completed and are attached to this certificate showing that the system meets the efficiency requirements used in the Maximum Applied Water Allowance calculation".

Landscape Architect Signature

Date

Landscape Contractor Signature

Date

Appendix D—Prescriptive Compliance Option

1. This appendix contains prescriptive requirements which may be used as a compliance option to the Model Water Efficient Landscape Ordinance.
2. Compliance with the following items is mandatory and must be documented on a landscape plan in order to use the prescriptive compliance option:
 - (a) Submit a Landscape Documentation Package which includes the following elements:
 - (1) Date;
 - (2) Project applicant;
 - (3) Project address (if available, parcel and/or lot number(s));

- (4) Total landscape area (square feet), including a breakdown of turf and plant material;
 - (5) Project type (e.g., new, rehabilitated, public, private, homeowner-installed);
 - (6) Water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well;
 - (7) Contact information for the project applicant and property owner;
 - (8) Applicant signature and date with statement, "I agree to comply with the requirements of the prescriptive compliance option to the MWEL0";
 - (9) Narrative description of project.
- (b) Incorporate compost at a rate of at least six cubic yards per 1,000 square feet to a depth of eight inches into landscape area (unless contraindicated by a soil test);
- (c) Plant material shall comply with all of the following;
- (1) For residential areas, install climate adapted plants that require occasional, little or no summer water (average WUCOLS plant factor 0.3) for 75% of the plant area excluding edibles and areas using recycled water, graywater, and/or rainwater as the exclusive source of water for irrigation. For non-residential areas, install climate adapted plants that require occasional, little or no summer water (average WUCOLS plant factor 0.3) for 100% of the plant area, excluding edibles and areas using recycled water, rainwater, or graywater as the exclusive source of water for irrigation.
 - (2) A minimum three-inch (3") layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.
 - (3) Do not plant invasive or non-fire safe species of plants not historically found in California and/or that spread outside cultivated areas and can damage environmental or economic resources as determined by Cal-IPC (www.cal-ipc.org), the local fire agency, and the District.
- (d) Turf shall comply with all of the following:
- (1) Turf and other high water use plants shall not exceed 25% of the landscape area in residential areas, and there shall be no turf permitted in non-residential areas;
 - (2) Turf shall not be planted on sloped areas which exceed a slope of one foot vertical elevation change for every 10 feet of horizontal length;
 - (3) Turf is prohibited in parkways less than 10 feet wide, unless the parkway is adjacent to a parking strip and used to enter and exit vehicles. Any turf in parkways must be irrigated by sub-surface irrigation or by other technology that creates no overspray or runoff.
- (e) Irrigation systems shall comply with the following:
- (1) Automatic irrigation controllers are required and must use evapotranspiration or soil moisture sensor data and utilize a rain sensor.
 - (2) Irrigation controllers shall be of a type which does not lose programming data (non-volatile memory) in the event the primary power source is interrupted.
 - (3) Pressure regulators shall be installed on the irrigation system to ensure the dynamic pressure of the components are within the manufacturers recommended pressure range.
 - (4) Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be installed as close as possible to the point of connection of the water supply and before

each valve or valve manifold.

- (5) Areas less than 10 feet in width in any direction shall be irrigated with subsurface irrigation or other means that produces no runoff or overspray.
- (f) For nonresidential projects with landscape areas of 1,000 sq. ft. or less, a private sub-meter(s) to measure landscape water use shall be installed.
- (g) At the time of final inspection, the permit applicant must provide the owner of the property with a certificate of completion, certificate of installation, irrigation schedule and a schedule of landscape and irrigation maintenance.

(Ord. 326 §1, 1991; Ord. 385 §1, 1999; Ord. 414 §2, 2010; Ord. 421 §3, 2011; Ord. 429 §2, 2015; Ord. 430 §2, 2015; Ord. 432 §2, 2016; Ord. 459 §§2—4, 2022; Ord. 461 §3, 2022)

§ 13.02.030. Water Shortage Contingency Plan (WSCP): Implementation.

The district-adopted Water Shortage Contingency Plan, as amended from time to time, shall be the guide for district actions during water shortage conditions. The plan, adopted in compliance with Water Code Section 10632, provides six shortage stages from least to most severe and sets forth detailed descriptions of the actions and procedures to be used to address varying degrees of water shortages. Driven by the criteria identified in the WSCP, the district General Manager will request the district Board of Directors to declare, by resolution, the appropriate water shortage stage and level of water conservation needed within the district. The water supply shortage so designated shall become effective immediately upon adoption, unless otherwise provided by resolution of the board, and shall be authorization for the General Manager to implement the actions that correlate with each water shortage stage. As water supply conditions improve, or further deteriorate, the General Manager will return to the board to revise the appropriate stage of response. It shall not be necessary to implement any stage prior to another; the stages may be implemented in any reasonable order as deemed necessary and appropriate by the board in light of existing water supply conditions.

(Ord. 316 §2, 1991; Ord. 323 §1, 1991; Ord. 325 §1, 1991; Ord. 376 §8, 1997; Ord. 387 §1, 1999; Ord. 462 §3, 2023)

§ 13.02.031. Public outreach of water shortage stages.

The WSCP includes public communications strategies to be utilized with each water shortage stage. With the board adoption of each new stage under the WSCP, the district will implement communication of each water shortage stage consistent with the guidance of the WSCP, including use of the district's webpage, social media and news media, as appropriate to assure that district customers are made aware of each newly adopted stage and associated actions.

(Ord. 462 §4, 2023)

§ 13.02.032. Water use prohibitions with associated water shortage stages.

Beginning with water shortage stage three, the WSCP identifies additional, or increasingly strict, customer water use prohibitions to augment the district's normal year water conservation program rules set forth in Sections **13.02.020** and **13.02.021**. These enhanced water use prohibitions will be implemented and enforced by the district in correspondence with the declaration of each water shortage stage. The new prohibitions will apply to all persons, customers and properties within the district, subject to the enforcement procedures set forth at Section **13.02.060** and the variance process set forth at Section **13.02.050**.

(Ord. 462 §5, 2023)

§ 13.02.040. Calculation of allowable water use.

When the requirements of Section **13.02.030** are in effect, consumers in Billing Codes 6, 7 and 8 will reduce their use by the appropriate percentage of their water budget.
(Ord. 316 §2, 1991; Ord. 376 §9, 1997; Ord. 387 §1, 1999)

§ 13.02.050. Variances.

- (1) The district may grant variances for use of water otherwise prohibited by this chapter if it is found and determined that:
 - (A) Failure to do so would cause an unnecessary and undue hardship on applicant or the public, including, but not limited to, adverse economic impacts;
 - (B) Failure to do so would cause an emergency condition affecting the health, sanitation, fire protection or safety of the applicant or the public; or
 - (C) Customer is able and agrees to provide an alternative means of providing comparable water conservation.
- (2) Any request for a variance shall be submitted to the district in a writing providing sufficient detail regarding the request and the reasons therefore. After consideration of the variance request, a written decision shall be provided to the customer rejecting, partially approving or approving the variance request. If the customer disagrees with the initial determination, the customer may avail themselves of the appeal process set forth in Section **13.02.090**.

(Ord. 462 §6, 2023)

§ 13.02.060. Enforcement.

- (1) For violations of the provisions set forth in chapter, other than Section **13.02.020(1)(B)**~~13.02.020(1)(B)~~, the following enforcement procedures shall apply:
 - (A) First Notice—Warning Letter. Any customer violating the regulations and restrictions on water use set forth in this chapter, other than Section **13.02.020(1)(B)**~~13.02.020(1)(B)~~, shall receive a written warning informing them of the violation for the first such violation and warning that a second such violation will result in a penalty.
 - (B) Notice of Violation. If, after receiving a written warning of violation for the same category of violation within one year, the district shall issue a notice of violation imposing a \$25.00 fine on the customer's next water bill.
- (2) Repeat Violations. For customers found by the district to incur a further violation within the same category for which customer has already received a fine within the past year, customer shall be charged a fine of \$250.00 for each successive violation.
- (3) Additional Enforcement Procedures.
 - (A) Failure by the customer to correct the violation and pay the applicable fine, after following the procedures set forth above in this section, may cause the district to install a flow restrictor to be installed in the service. If a flow restrictor is placed, a charge of \$150.00 for cost of installation and an additional \$150.00 cost for removal shall be paid by the violator.
 - (B) Any willful violation occurring subsequent to the issuance of the third written notice of violation may constitute a misdemeanor and may be referred to the Marin County District Attorney's office for prosecution. An individual convicted shall be punished by imprisonment in the County Jail for not more than 30 days, or by a fine not exceeding \$1,000.00 or both.

(C) The district may also disconnect the water service pursuant to Section **11.28.020** of this code. If water service is disconnected, it shall be restored only upon payment of the turn-on charge fixed by the Board of Directors under the provisions of Section **11.08.150** of this code.

(Ord. 316 §2, 1991; Ord. 387 §1, 1999; Ord. 421 §4, 2011; Ord. 461 §5, 2022)

§ 13.02.065. Unauthorized water use.

Use of water without having made application to the district for water service or use of any district water not metered pursuant to such application is prohibited pursuant to this chapter, and in addition to the penalties contained in Section **13.02.080**, violators will be subject to the charges for use of such water set forth in Section **6.01.080** of this code.

(Ord. 316 §2, 1991)

§ 13.02.070. Further prohibitions.

It is unlawful for any person, firm, partnership, association, corporation or political entity to remove, replace, alter or damage any water meter or components thereof, including but not limited to the meter face, its dials or other water usage indicators and any flow restricting device installed pursuant to Section **13.02.060**.

(Ord. 316 §2, 1991)

§ 13.02.080. Penalty for violations.

Except as provided in Section **13.02.060**, for the first and second violations any person, firm, partnership, association, corporation or political entity violating or causing or permitting the violation of any of the provisions of this chapter or providing false information to the district in response to district's requests for information needed by the district to calculate consumer water allotments shall be guilty of a misdemeanor punishable by imprisonment in the county jail for not more than thirty days or by a fine not exceeding one thousand dollars or both. Each separate day or portion thereof in which any violation occurs or continues without a good faith effort by the responsible party to correct the violation shall constitute a separate offense and, upon conviction thereof, shall be separately punishable.

(Ord. 316 §2, 1991)

§ 13.02.090. Appeals.

Customers may appeal a decision regarding a variance or an enforcement action by following the procedures set forth below:

- (1) Within 30 calendar days of the variance denial or partial denial or a notice of violation, customer shall mail a written appeal containing all applicable evidence supporting their position to the Water Efficiency Department at 220 Nellen Avenue, Corte Madera, CA 94925. For purposes of this section an appeal shall be deemed received by the district on the day of post-mark by the U.S. Postal Service.
- (2) The district shall respond to the appeal in writing either denying, granting or partially granting the appeal. If customer disputes the initial written determination of his/her appeal, then customer may request a further appeal by submitting a further writing to the district within 15 calendar days from the date of the initial written response to the appeal.
- (3) Upon receipt of a timely further appeal, a hearing on the appeal will be scheduled and the district will mail notice of this date to the customer at least 10 calendar days before the hearing.
- (4) The General Manager or designee shall conduct a hearing on the appeal considering all applicable facts and issue a written decision containing his or her decision on the appeal. The General

Manager's or designee's decision shall be final.

- (5) Any action not timely appealed shall be deemed final.
- (6) Pending receipt of a written appeal or pending hearing pursuant to an appeal, the district may take appropriate steps to prevent unauthorized use of water as appropriate to prevent waste.
- (7) This notice and hearing procedure shall not apply to those water waste situations charged as misdemeanors.
(Ord. 316 §2, 1991; Ord. 461 §6, 2022)

§ 13.02.100. Remedies/cumulative.

The remedies available to the district to enforce this chapter are in addition to any other remedies available under the district's code, or any state statutes or regulations, and do not replace or supplant any other remedy, but are cumulative.
(Ord. 316 §2, 1991)

§ 13.02.110. Chapter controlling.

The provisions of this chapter shall prevail and control in the event of any inconsistency between this chapter and any other rule, regulation, ordinance or code of this district.
(Ord. 316 §2, 1991)

Appendices

Five-Year Water Efficiency Master Plan

Marin Municipal Water District



Appendix E
2020 Customer Survey








Customer Survey Results

*Results of a Districtwide Survey
Conducted July 26-31, 2023*



OPINION
RESEARCH
& STRATEGY

Survey Specifics and Methodology

Dates	July 26-31, 2023
Survey Type	Dual-mode Customer Survey
Research Population	Marin Water Customers
Total Interviews	415
Margin of Sampling Error	±4.9% at the 95% Confidence Level
Contact Methods	 Telephone Calls  Email Invitations  Text Invitations
Data Collection Modes	 Telephone Interviews  Online Interviews
Survey Tracking	2018

(Note: Not All Results Will Sum to 100% Due to Rounding)

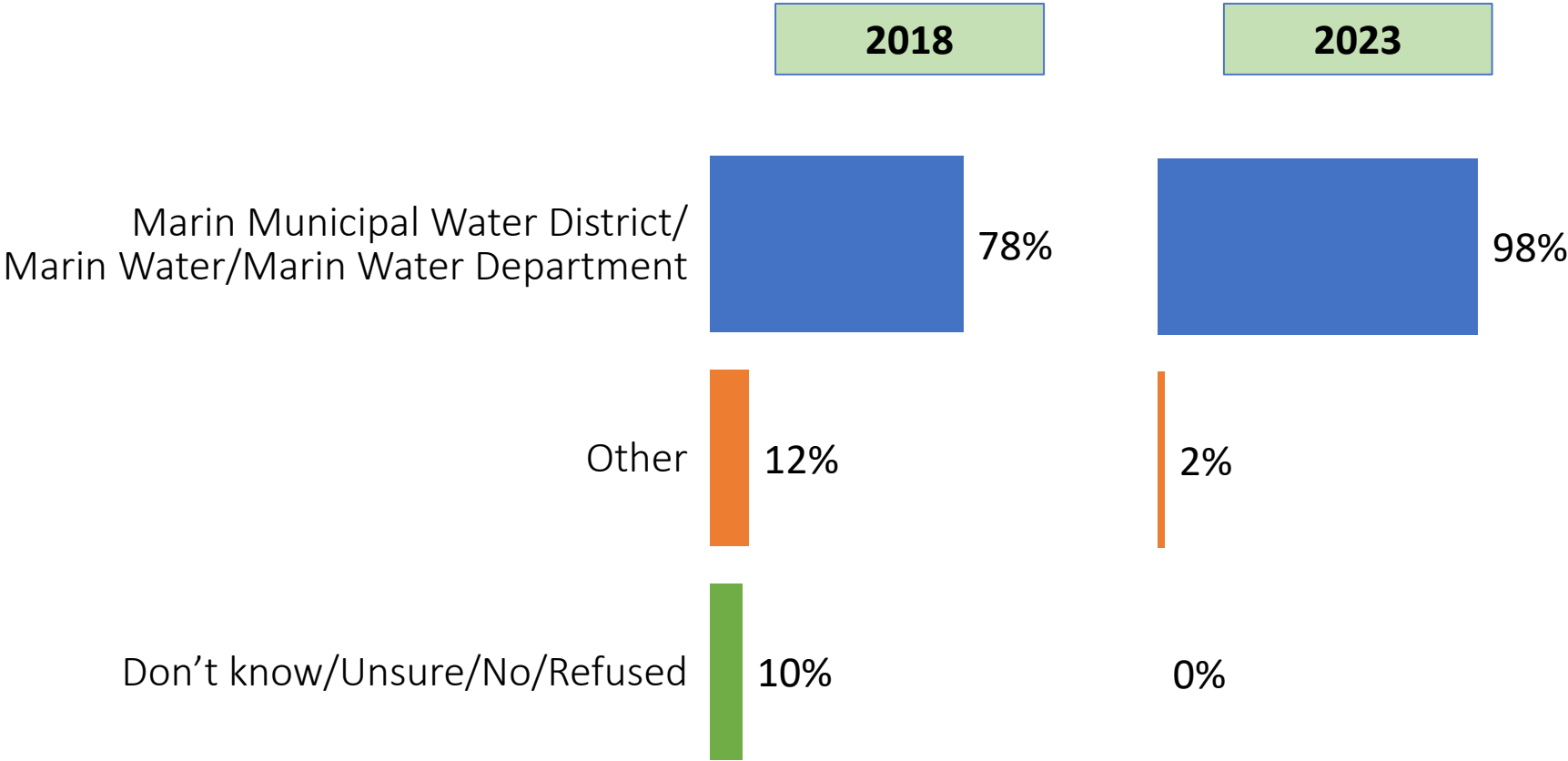


**MARIN
WATER**

Impressions of Marin Water

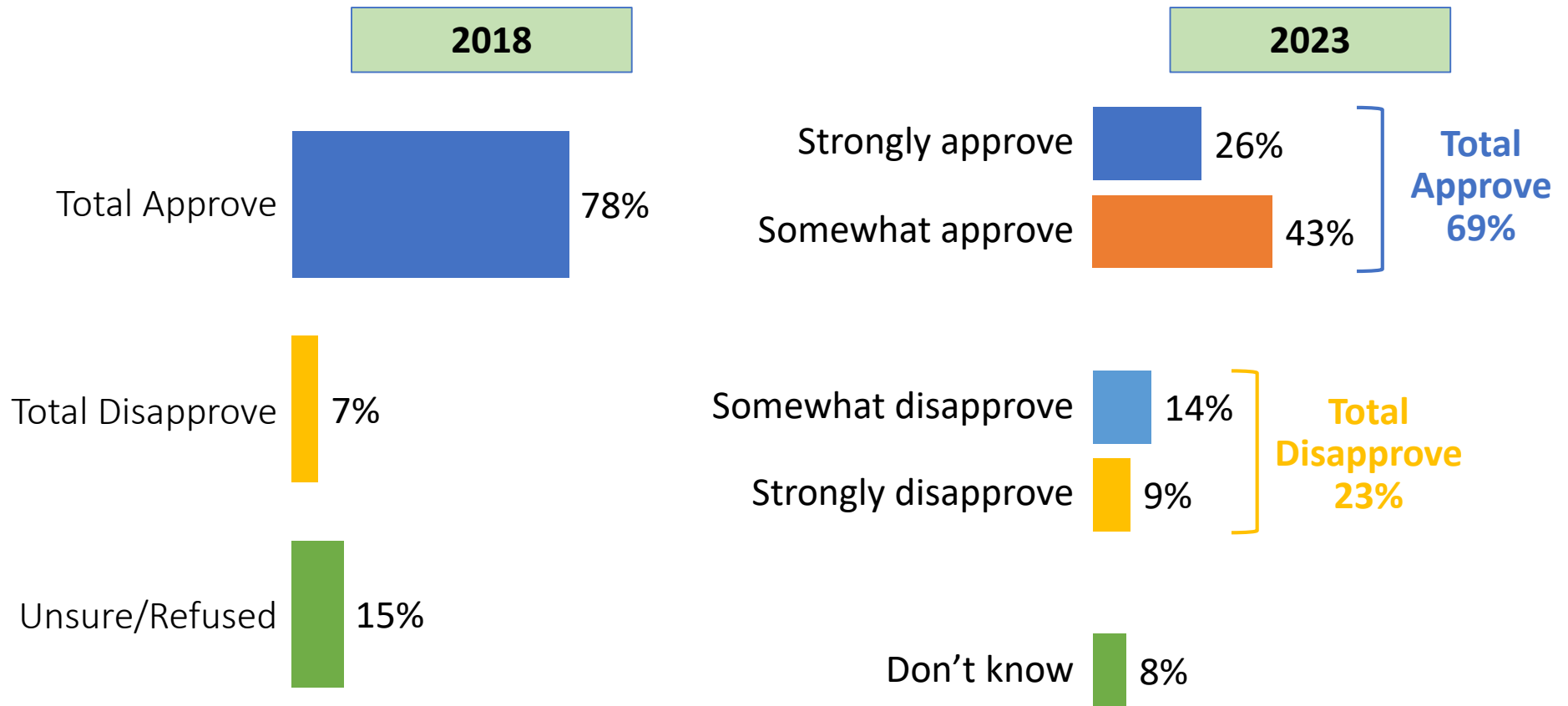
Respondents were widely able to identify Marin Water as their water service.

*Can you tell me who provides the water service for your home?
(Open-ended)*



Two-thirds say they approve of the job being done by Marin Water.

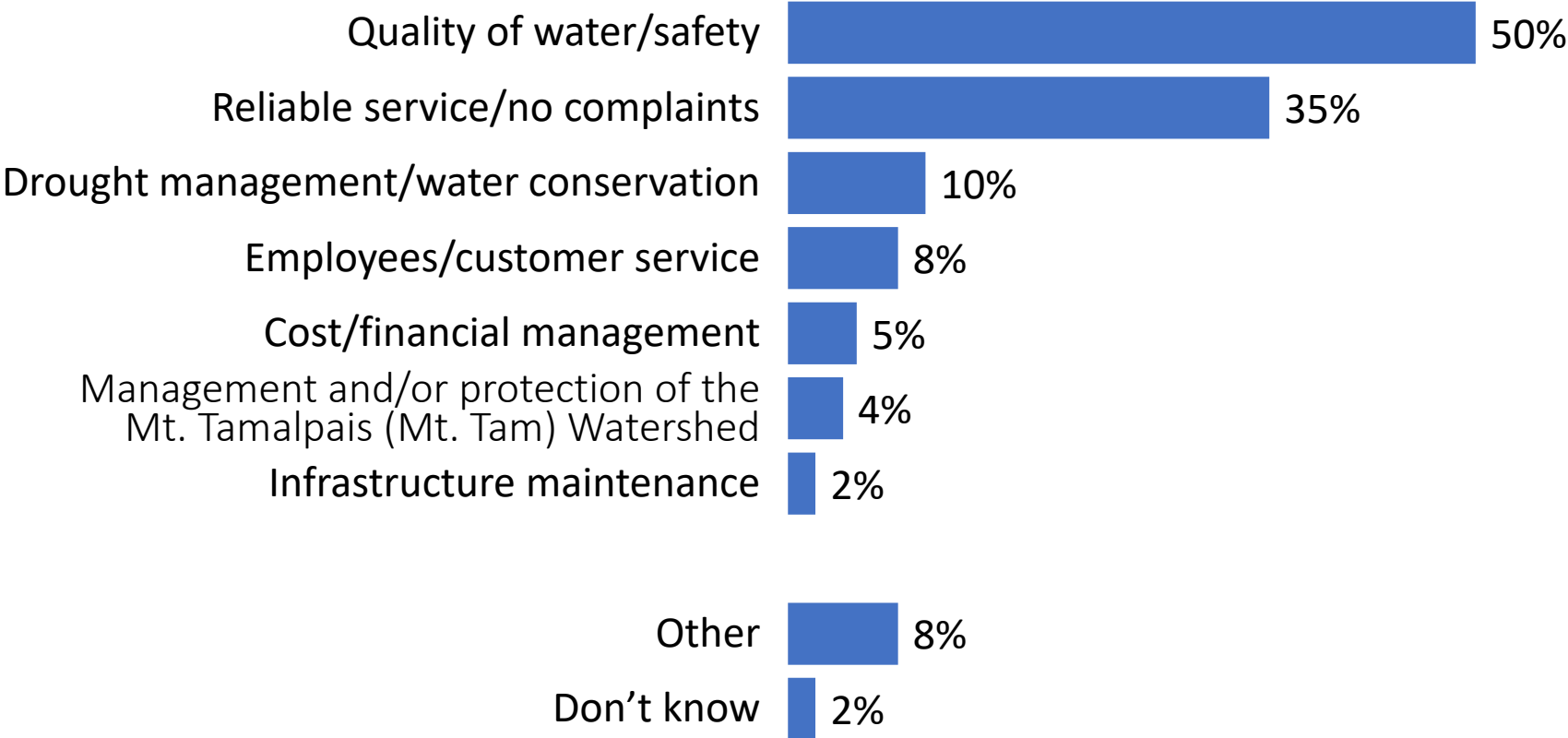
Marin Water provides drinking water to more than 191,000 customers in central and southern Marin County. In general, do you approve or disapprove of the job that Marin Water is doing?



Satisfaction with water quality and safety and reliability drive approval.

Thinking specifically, what is it that Marin Water is doing that leads you to approve of how they're performing as a drinking water service provider?

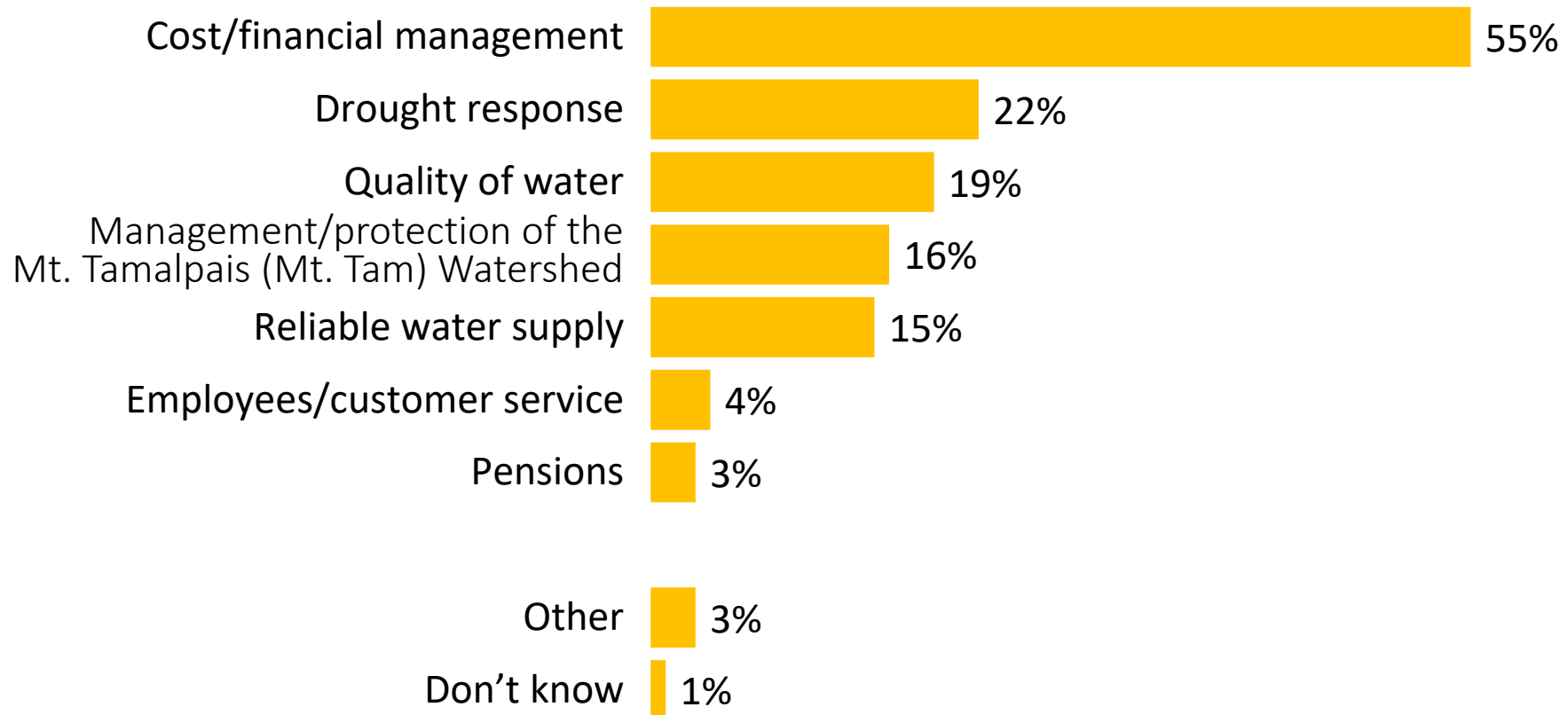
(Open-ended; Asked of Those Who Approve; n=287)



Concerns about costs are the main cause of disapproval.

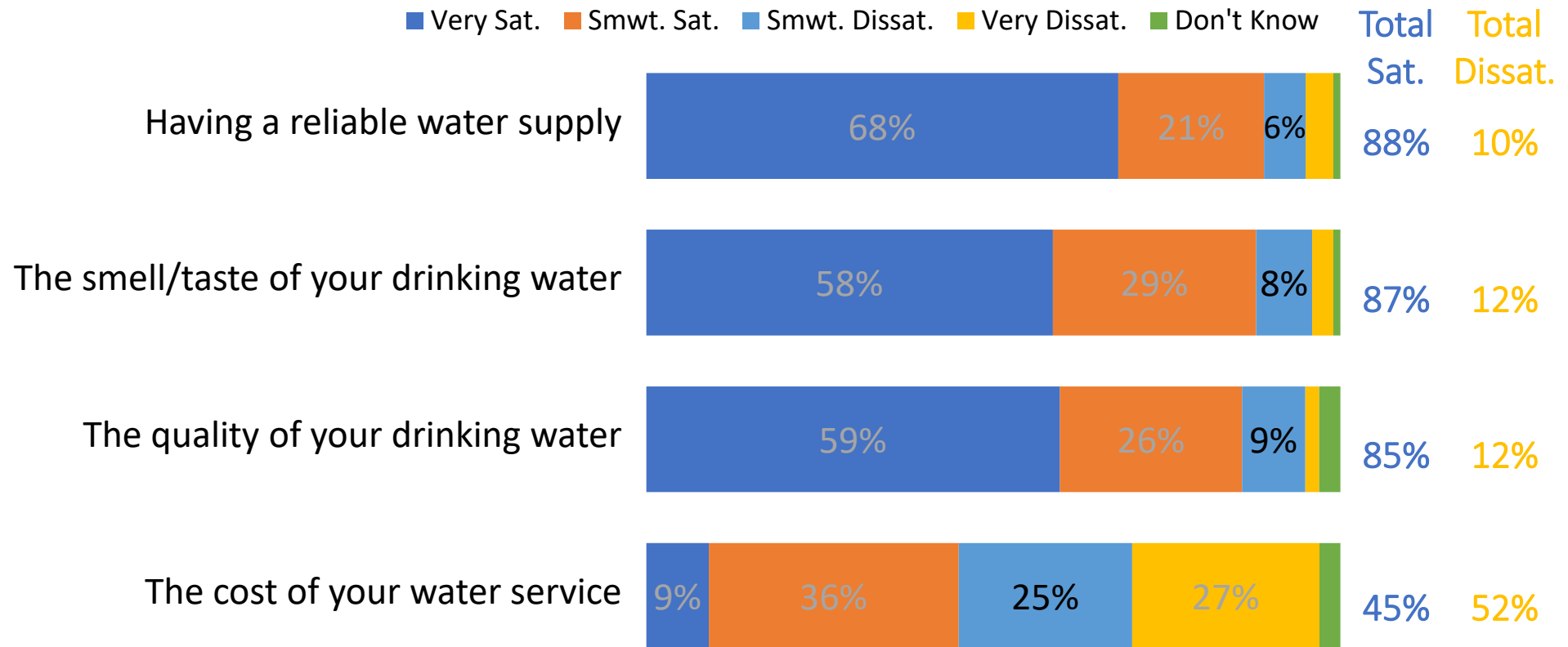
Thinking specifically, what is it that Marin Water is doing, or not doing, that leads you to disapprove of how they're performing as a drinking water service provider?

(Open-ended; Asked of Those Who Disapprove; n=94)



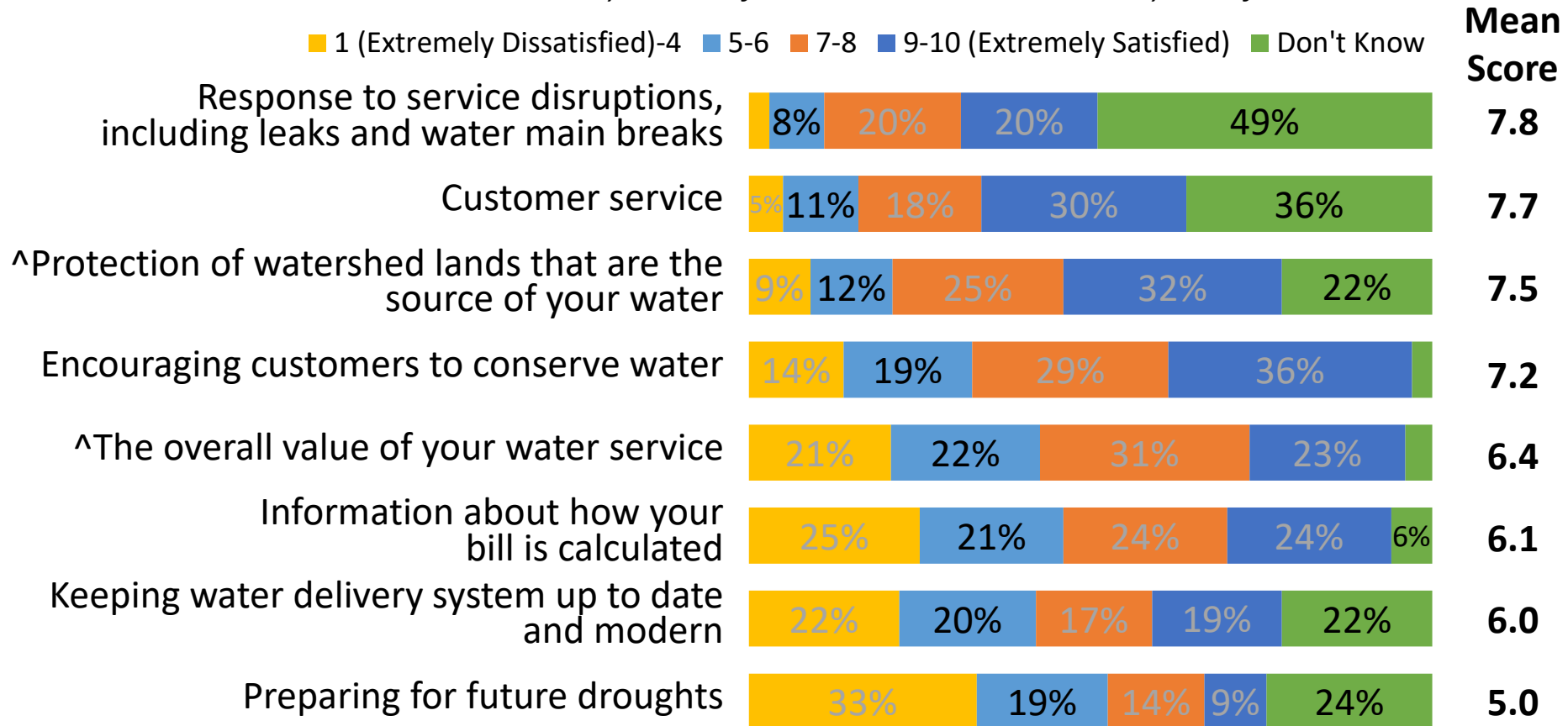
Respondents are highly satisfied with a number of aspects of water service, but are divided on cost.

I'm going to read you a list of items related to water that are provided by Marin Water. Please tell me whether you are satisfied or dissatisfied with your water supplier's performance in that area.



Response to service disruptions and customer service were highest rated among those who had an opinion.

I am going to read you a list of different aspects of your water service provided by Marin Water. Please tell me how satisfied you are with that particular aspect using a 1 to 10 scale, where “1” is “extremely dissatisfied” and “10” is “extremely satisfied.”



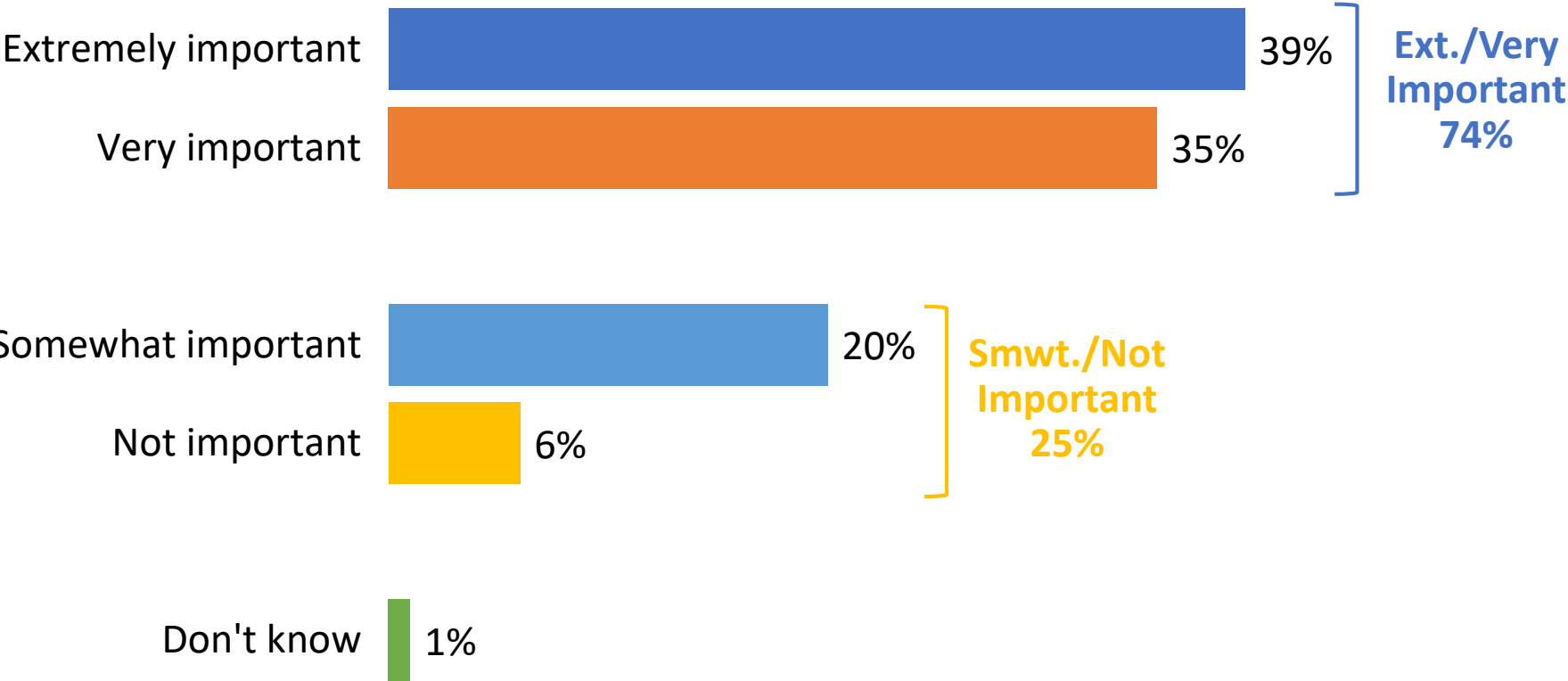


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Views on Water Efficiency Programs

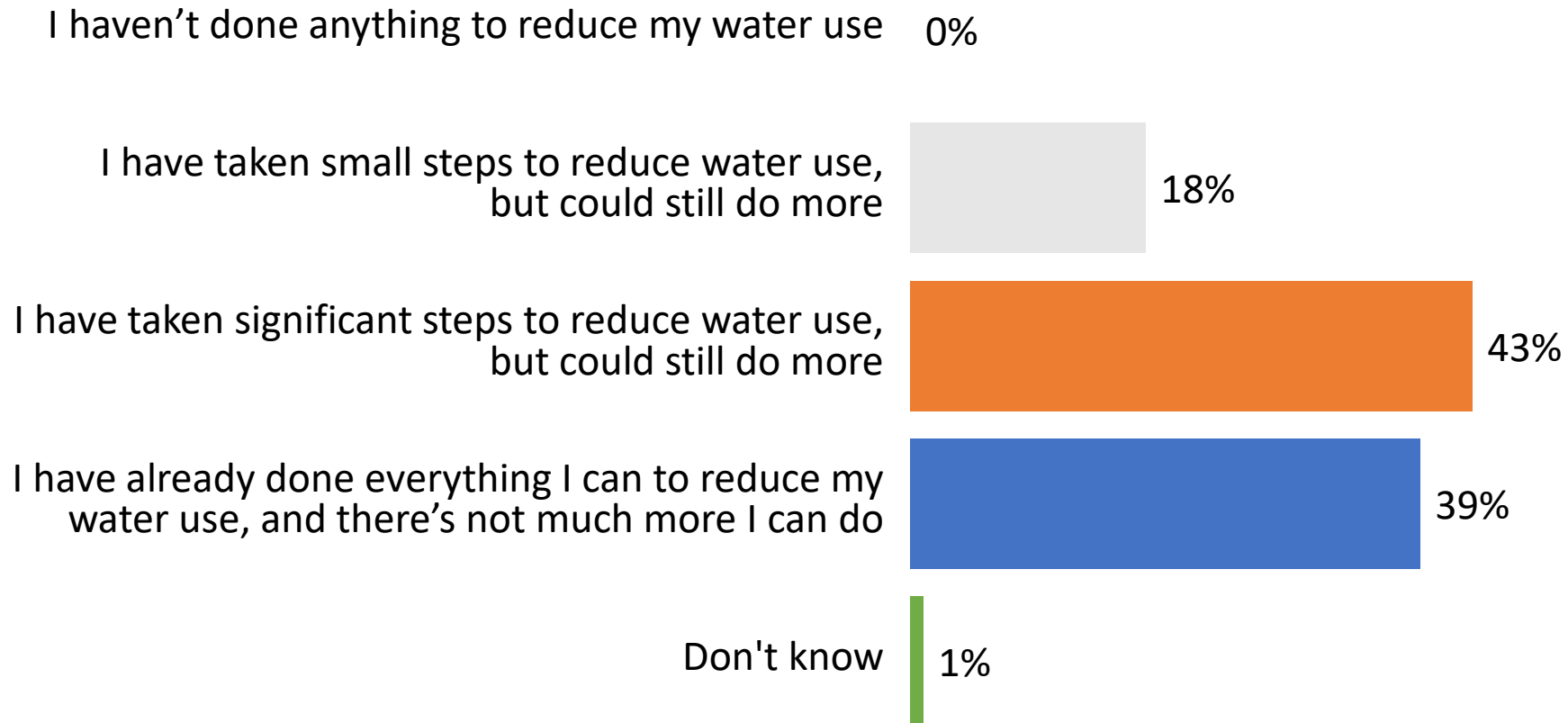
Three in four customers say that reducing water usage is extremely or very important.

Although California experiences cycles of drought, because of the intense rainy season earlier this year, we are not currently in a drought. How important is it to reduce our water usage and use water efficiently even if we are not currently in a drought?



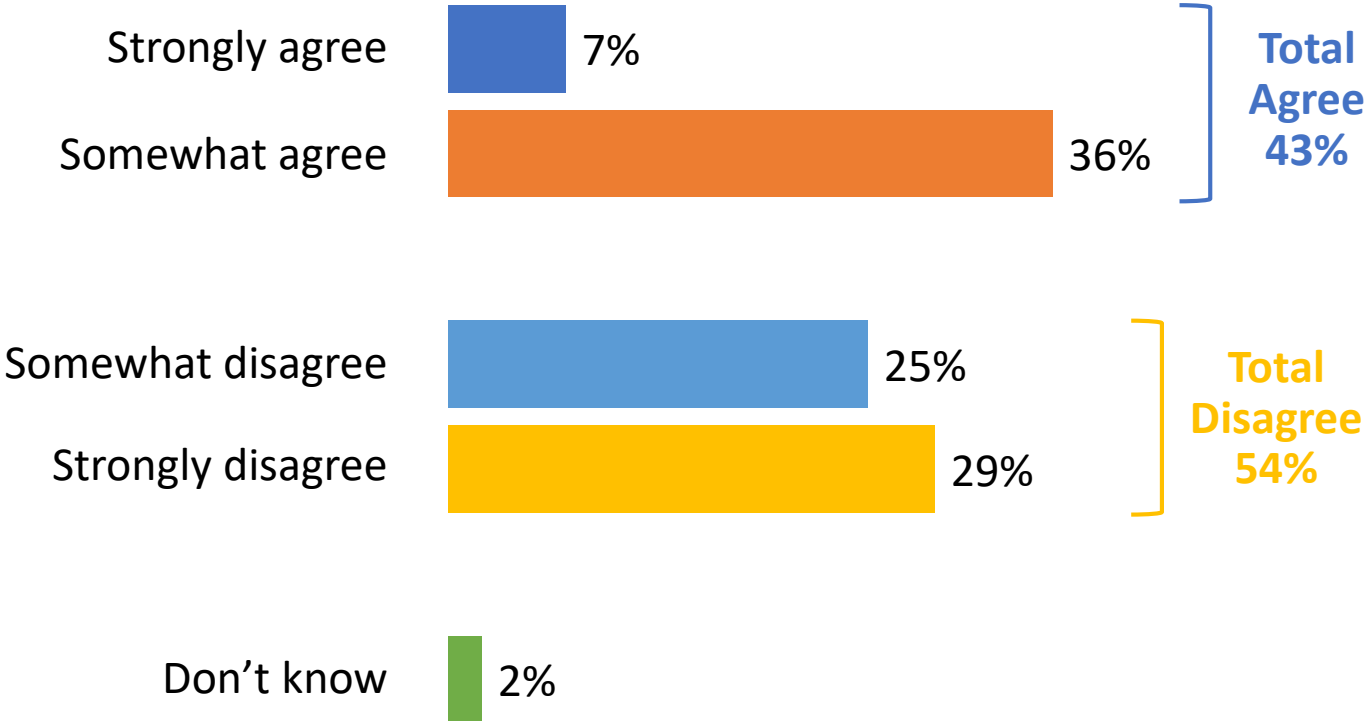
Almost all customers say they have taken steps to reduce their water usage.

Which of the following statements best describes your efforts to reduce your water use?



Two in five say they could benefit from ways to reduce their water use; a majority say they do not need help reducing their water use.

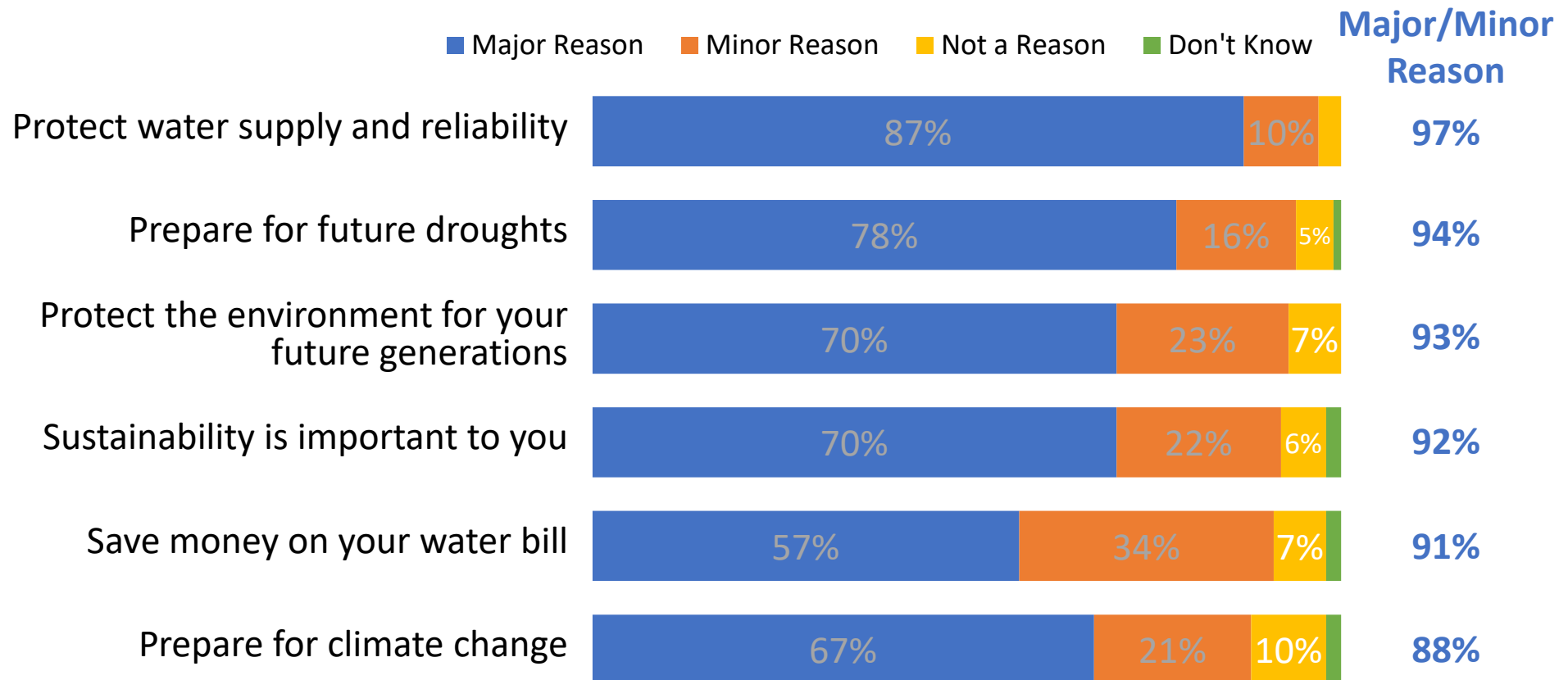
*Do you agree or disagree with the following statement:
"I need help to find the best ways for reducing my water use."*



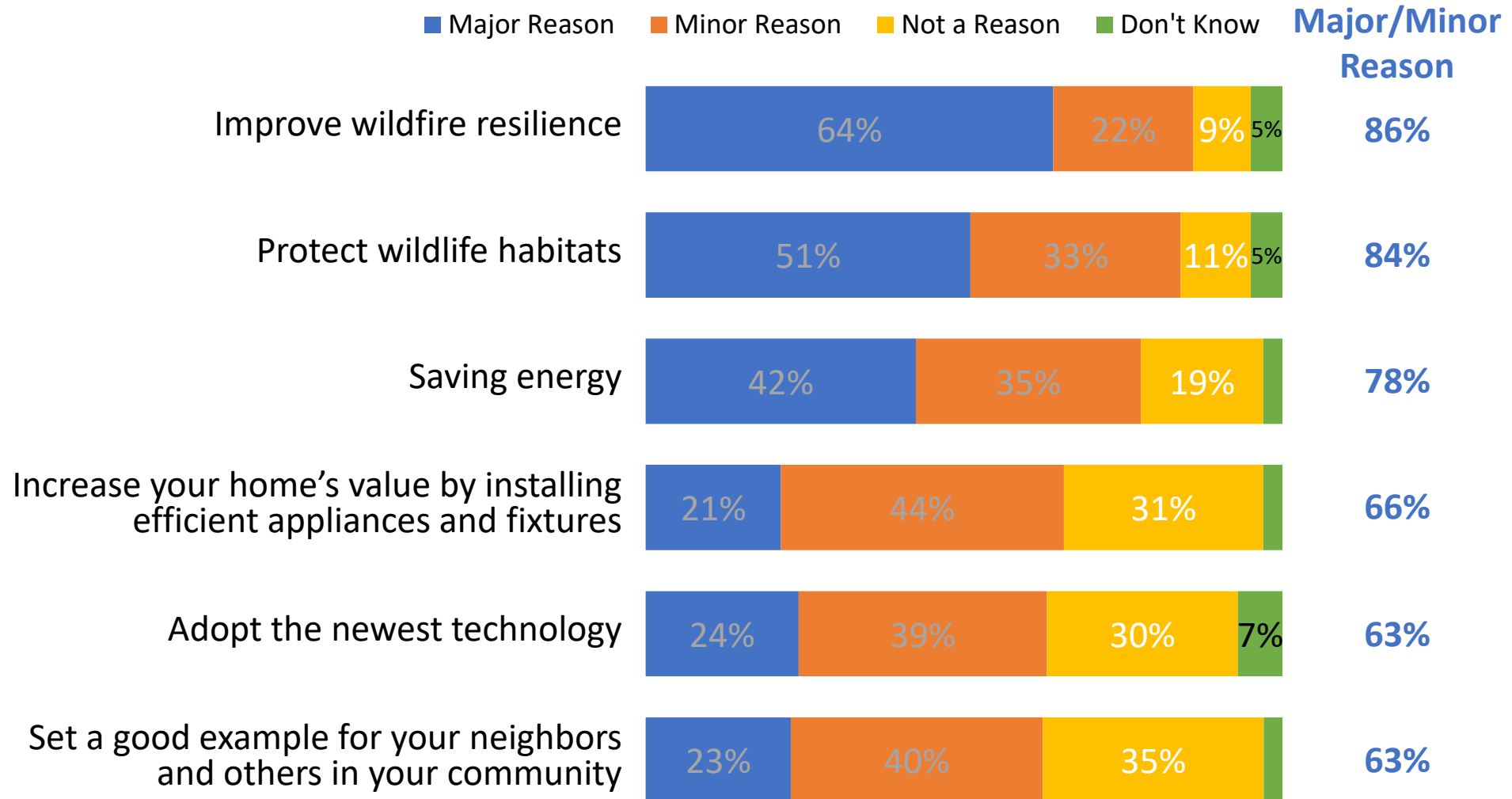
Q12a. Which of the following statements best describes your efforts to reduce your water use?

Protecting water supply and preparing for future droughts are the major reasons to reduce water use.

*Here is a list of reasons people may reduce their water use and use water more efficiently.
Please tell me if this is a major reason, a minor reason, or not a reason
for you to reduce your water use.*



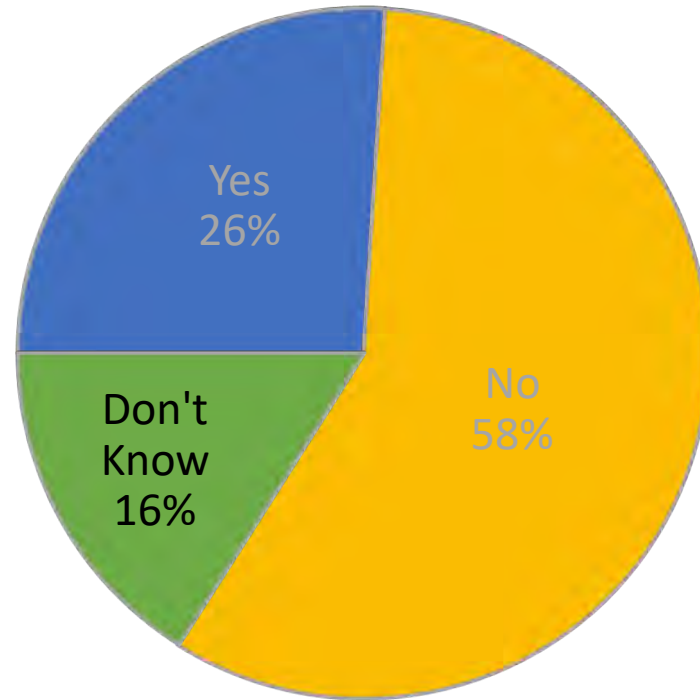
Home value, new technology, and setting an example are lower-ranking motivators.



Q13. Here is a list of reasons people may reduce their water use and use water more efficiently. Please tell me if this is a major reason, a minor reason, or not a reason for you to reduce your water use. Split Sample

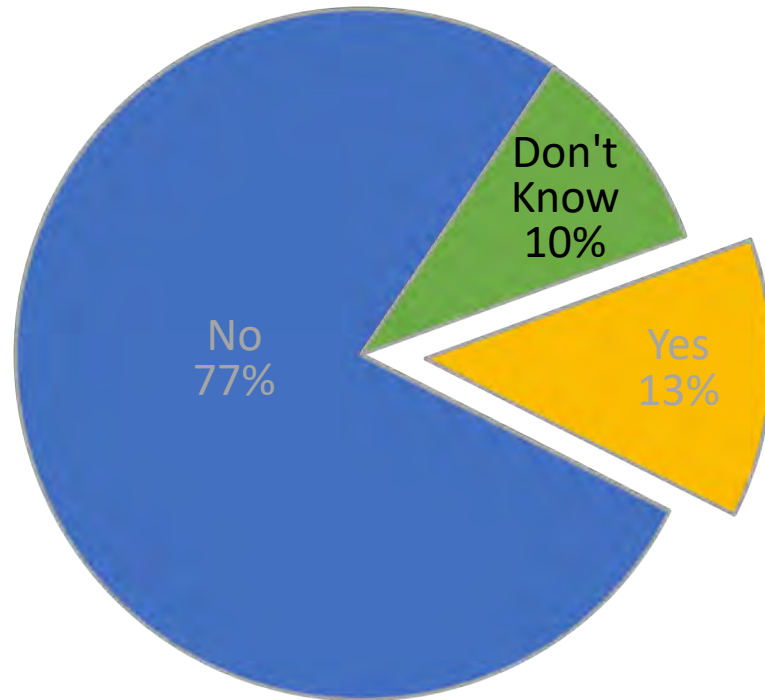
One-quarter say they've used one of Marin Water's programs.

Have you ever used any of Marin Water's rebates, incentives, or water efficiency programs?



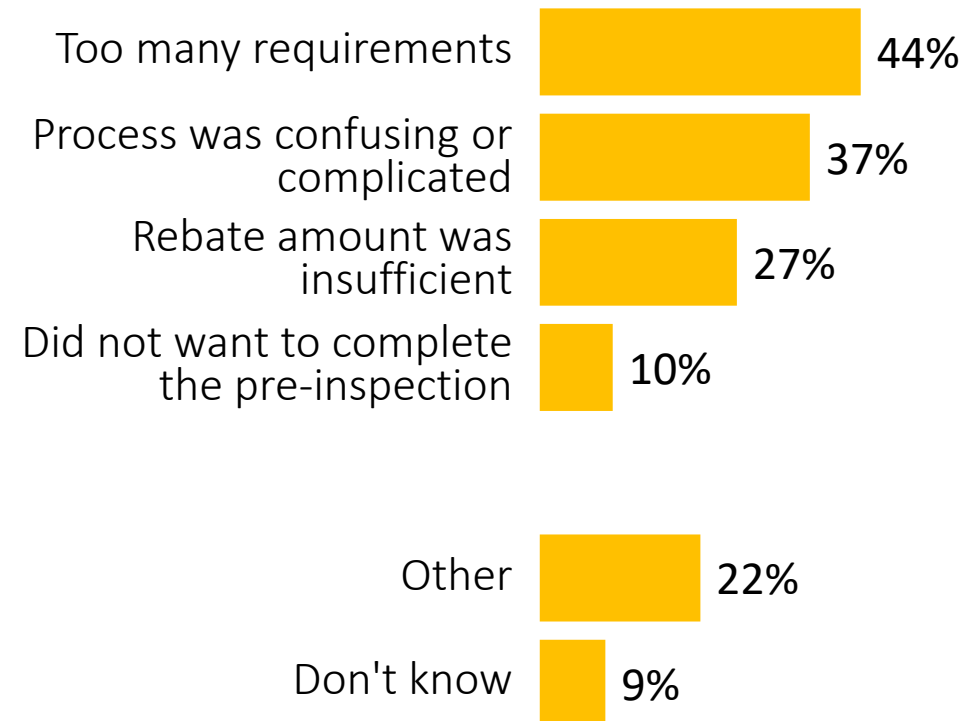
One in ten say they started applying for a program but did not complete it.

Have you ever started the process of applying for a Marin Water rebate, incentive, or water efficiency program but not completed the process?



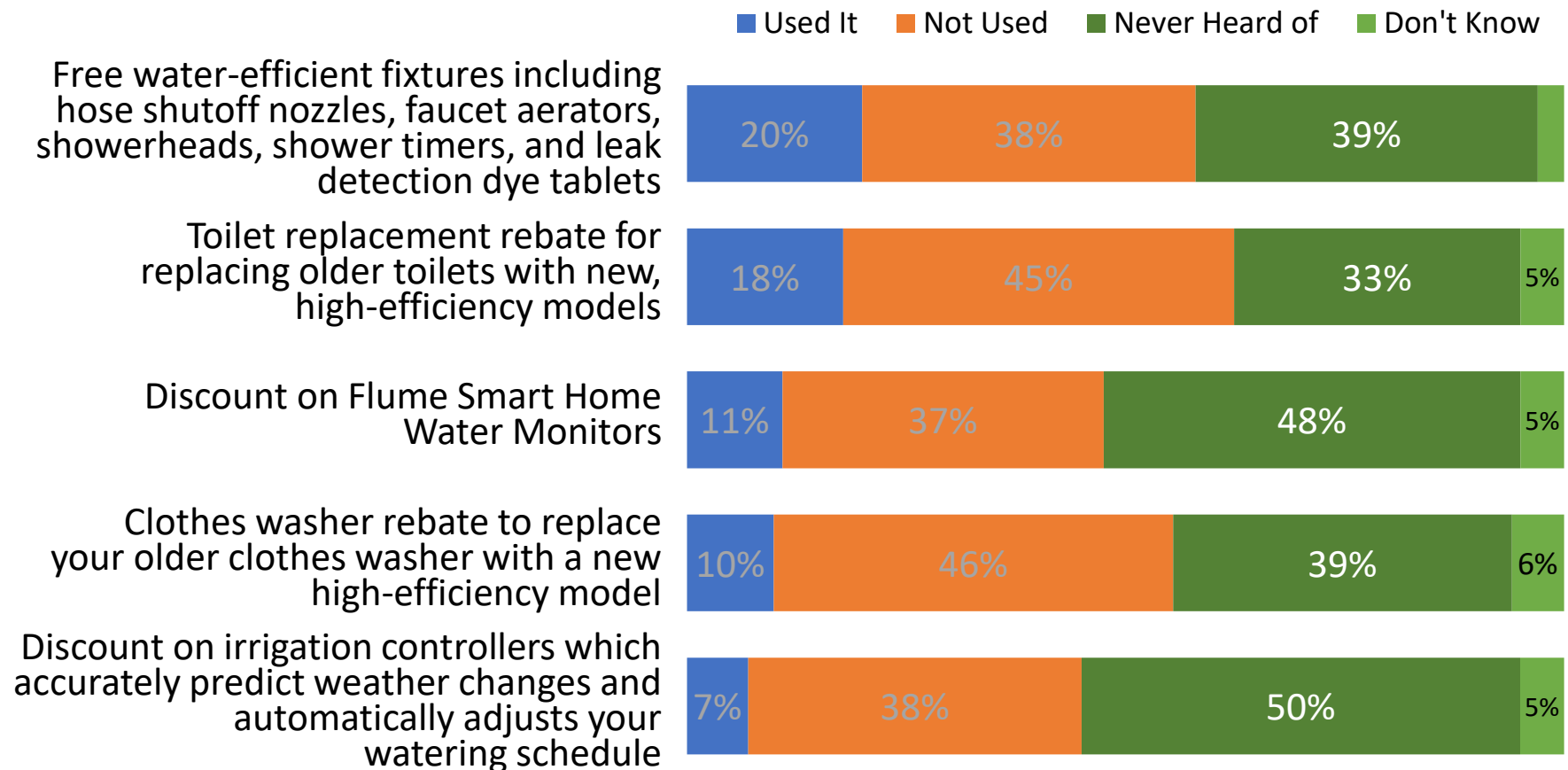
Why did you not complete the process of applying for a Marin Water rebate, incentive, or water efficiency program?

(Multiple Responses Accepted; Asked of Those Who Started Application but Did Not Complete; n=45)

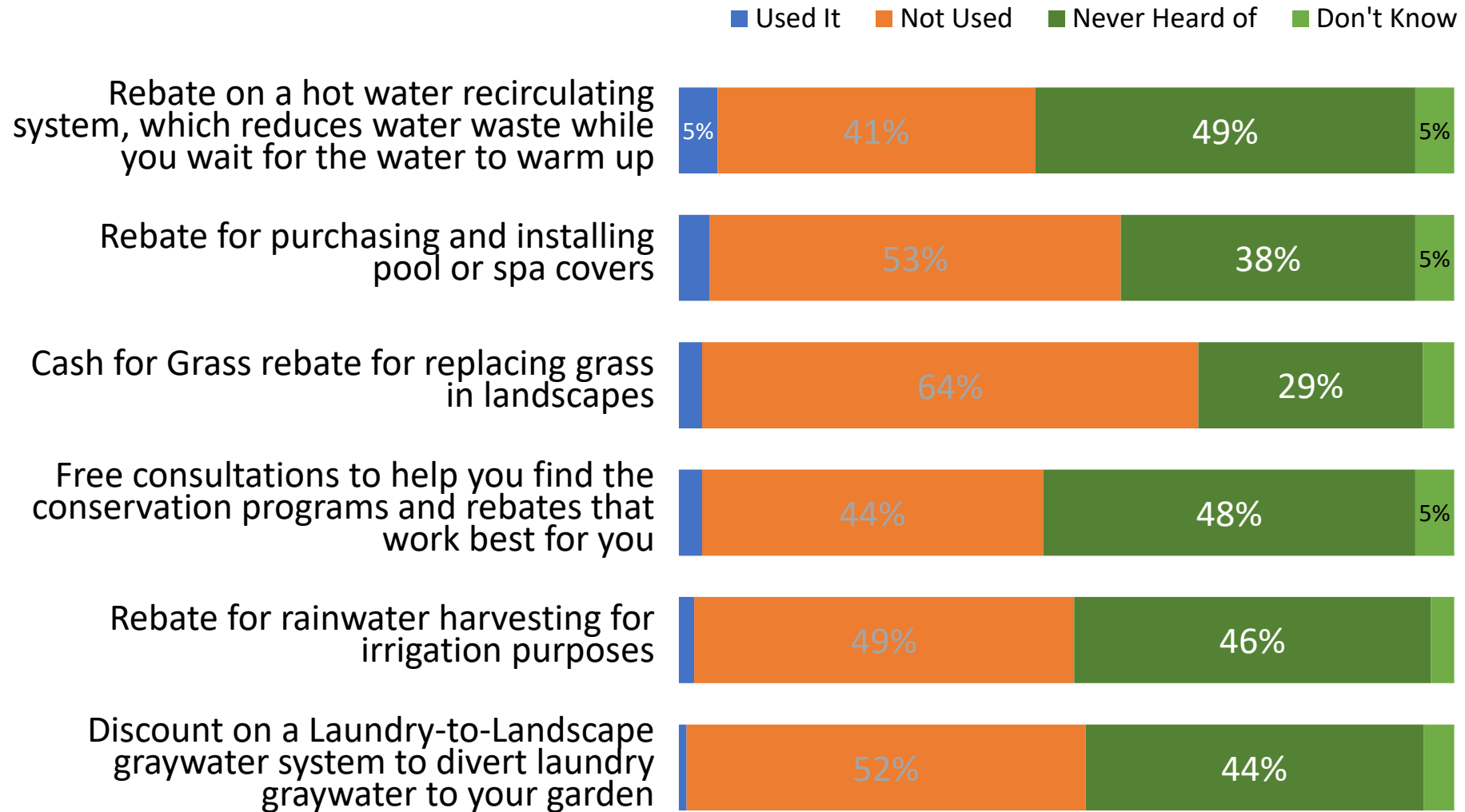


Free water efficient fixtures and toilet replacement were the most commonly-used rebates.

Here is a list of Marin Water rebates, incentives, and water efficiency programs available to residential customers. Please indicate if you have used this program or not used it.



Cash for Grass has some of the highest awareness even though few say they've used it.



Q17. Here is a list of Marin Water rebates, incentives, and water efficiency programs available to residential customers. Please indicate if you have used this program or not used it.

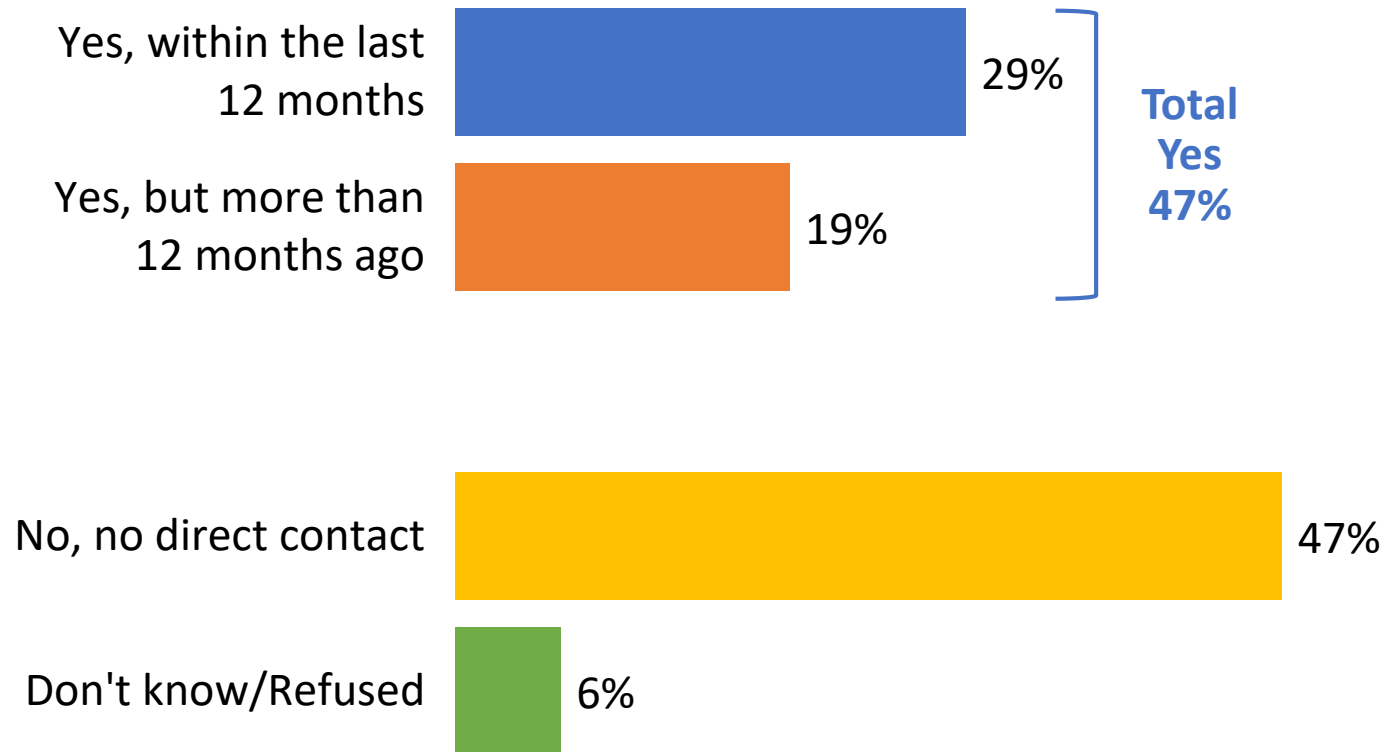


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Experiences with Customer Service

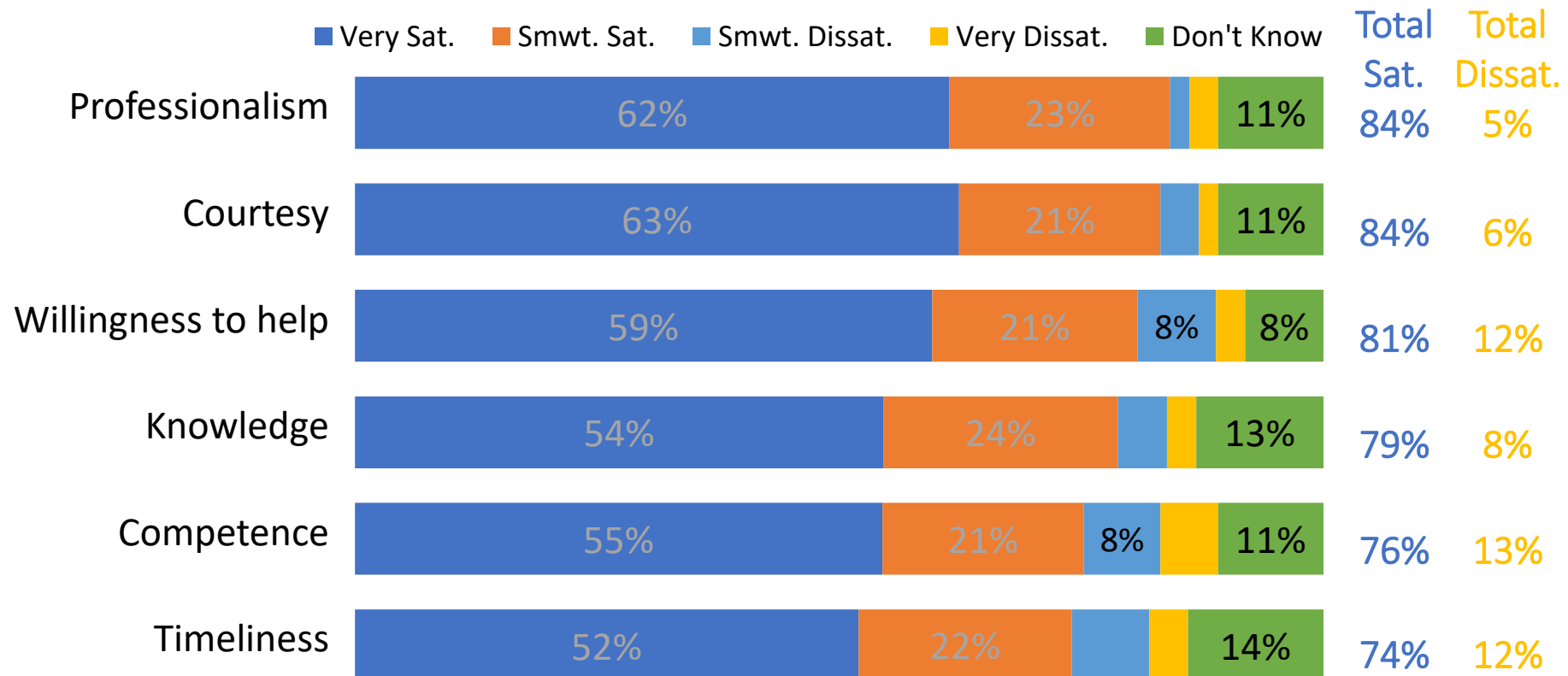
Half of respondents say they've had direct contact with Marin Water.

Have you or anyone in your household had direct contact with Marin Water, such as through a phone call, email, on-site appointment or other form of contact?



Those who have interacted with Marin Water rate their experience with the service received highly.

Please tell me how satisfied you are with the following aspects of service provided by Marin Water. Please tell me if you are very satisfied, somewhat satisfied, somewhat dissatisfied, or very dissatisfied. (Among Those Who Have Had Contact with Marin Water, n=196)



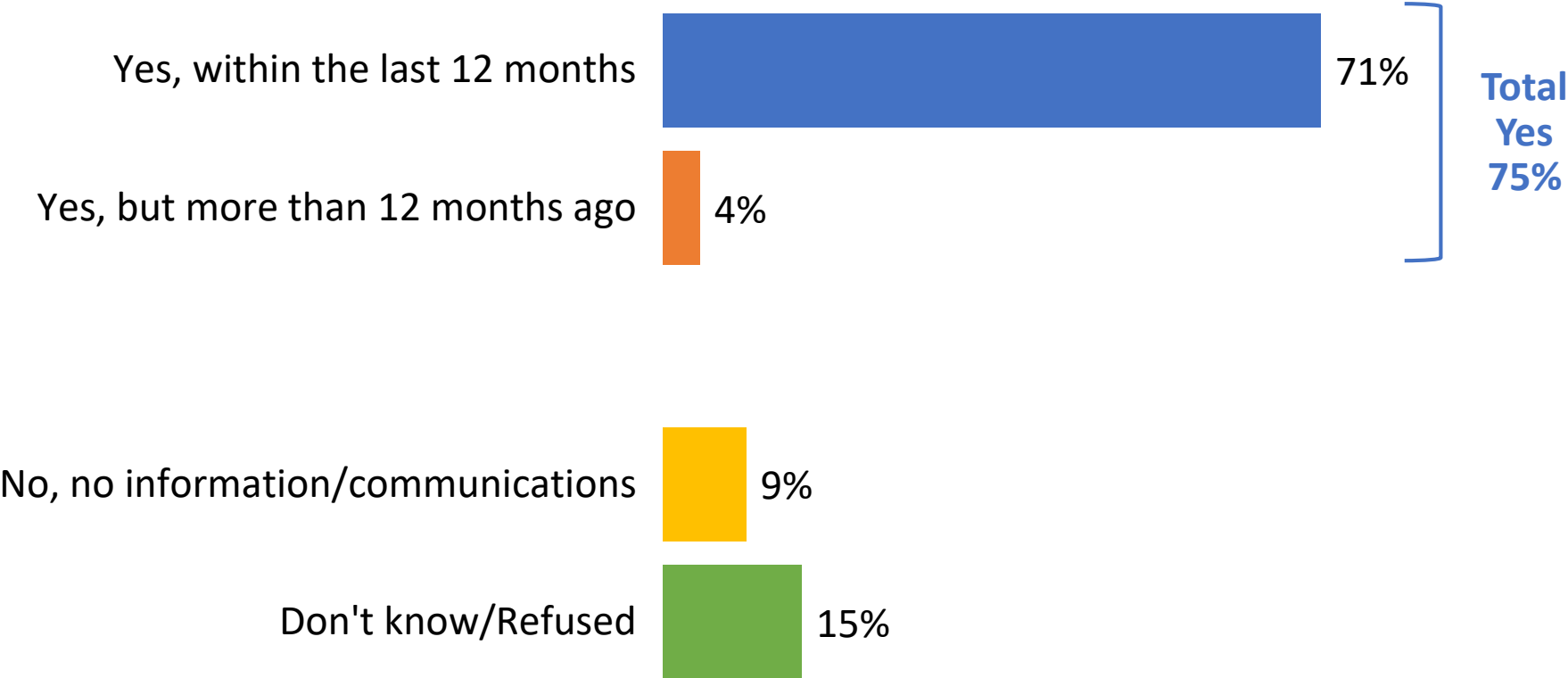


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Communication Preferences

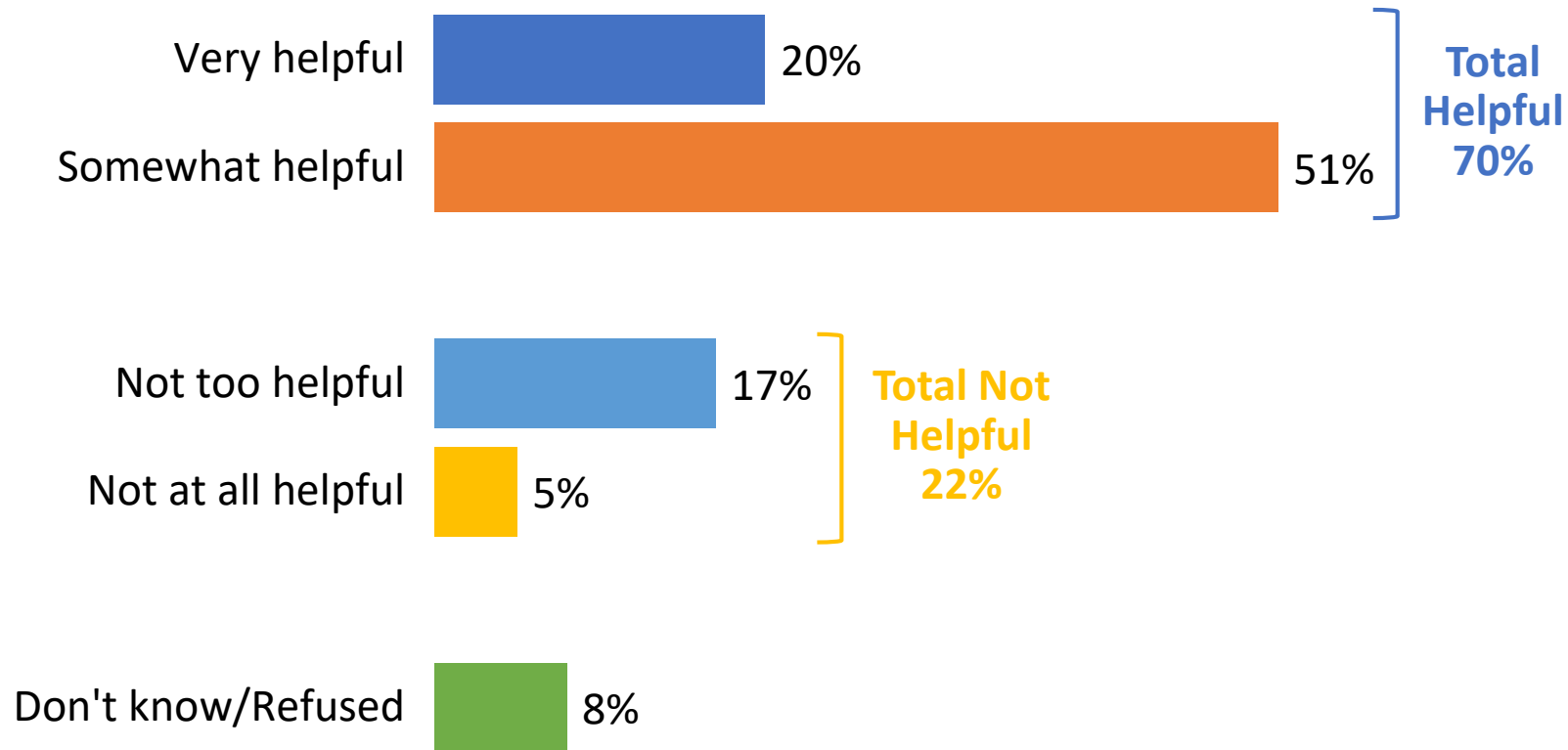
Three-quarters say they have received information and communications from Marin Water.

Have you ever received information or communications from Marin Water?



Seven in ten say the information they received was helpful, but few say it was very helpful.

*How helpful was the information you received from Marin Water?
(Open-ended; Asked of Those Who Recall Receiving Information; n=313)*



Respondents prefer getting information through monthly newsletters and their bills.

*How would you prefer that Marin Water keep you informed about local water and water-related issues?
(Multiple Responses Accepted)*

Communication Method	%
Marin Water monthly newsletter emailed to your inbox	66%
Inserts included in Marin Water bills	49%
The Marin Water website	31%
Social media like Facebook, Instagram, Twitter or Nextdoor	13%
Notices and articles printed in newspapers	11%
Community events	6%
TV news	5%
Radio news	3%
Don't know/Refused	4%

Q25. Slight Differences in Wording of Previous Survey



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Conclusions

Conclusions

- Customers are virtually all familiar with Marin Water.
- While the agency benefits from widespread approval, customer satisfaction has decreased since the last customer survey.
 - Respondents' approval is largely motivated by satisfaction with water quality and the reliability of service.
 - Those who are dissatisfied point to rising costs and rates.
 - Consistent with these comments, respondents rate the reliability of water quality, the overall quality, and the smell and taste highly, but over half say they are dissatisfied with costs.
- Customers highly value using water efficiently.
 - Two in five say they could use help finding ways to reduce their water use, although a majority say they do not need help reducing their water use.
- Roughly one-quarter say they've used one of Marin Water's water efficiency programs; many are unfamiliar with a number of the incentives available.
- Approximately half of respondents had contact with Marin Water; those who did rate a number of aspects of the service received highly.
 - Customers are most familiar with the Cash for Grass rebate program, though the actual participation rate is low.
- Respondents also found communications from Marin Water helpful and most preferred newsletters mailed to them and inserts in their bills as forms of communication.
- Overall, the findings suggest that Marin Water customers are satisfied with the service they receive, however, they are divided on cost; additionally, there is room to increase awareness and use of programs and rebates available.

For more information,
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