2015 Municipal Water Efficiency Plan
Aurora Water
City of Aurora, Colorado

Prepared for:

Colorado Water Conservation Board
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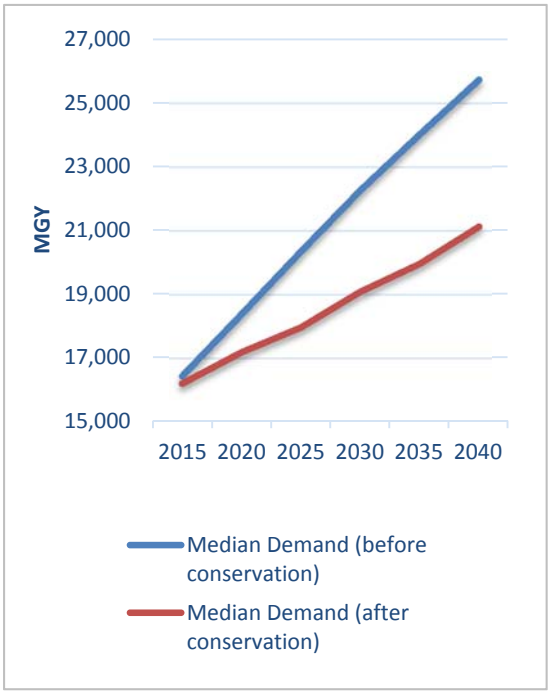
Introduction

Aurora Water is committed to promoting the efficient use of its water resources. Since 1980, Aurora Water Conservation has developed audit programs, offered rebates and classes, and encouraged changes in local regulations in order to promote water savings wherever possible. Water conservation efforts have led to a reduced gallon per capita per day (gpcd) and a consistent annual demand despite an increase in population. Additionally, Aurora's conservation efforts have contributed to less pressure on upstream supplies, a delay in the construction of new capital projects, stabilization of water rates and an increased ability to respond to drought effectively. Aurora's historic and predicted conservation efforts are utilized for demand forecasting in Aurora's Integrated Water Master Plan.

This efficiency plan is an update of the 2007 plan submitted to the Colorado Water Conservation Board. The 2007 water conservation goal was a 10% decrease in gpcd over 25 years. The goal also indicated conservation savings of 100-150 acre-feet per year. Aurora Water has already met or surpassed these goals on an annual basis and has learned many lessons along the way. The remarkable success in meeting the original goal coupled with the need for more precise data led Aurora to utilize new evaluation methods, including a Demand Side Management Least Cost Planning Decision Support System (DSS Model), to generate an updated water savings goal and implementation plan.

The updated water savings goal is a 10% reduction in gpcd from 2014 by 2040. Aurora created qualitative and quantitative benchmarks to mark the progress toward the savings goal with the involvement of staff from across the utility, Aurora's Planning Department, outside consultants, and stakeholders. Stakeholders were involved through the survey of over two thousand customers and a review of the Plan by the Citizen Water Advisory Committee, the general public, and the City of Aurora Council members. The benchmarks are:



1. Give customers tools to evaluate their own use and make efficiency improvements through fixture replacement or changes in usage patterns.
2. Expand the youth education program to include tailored classes for each grade level, including higher education, that convey the importance of water conservation, stewardship and pollution prevention.
3. Make conservation education actionable with incentives and audits.
4. Respond to drought in an efficient and effective manner.
5. Influence market transition towards more efficient fixtures and practices, accelerating change beyond local, state and federal codes.
6. Support local ordinances that promote water conservation through collaborations with other departments.
7. Partner with CII (Commercial, Industrial, and Institutional) customers to create and meet benchmarks through tailored water efficiency programs.

Aurora Water is excited to implement the changes listed in this plan and to continue to be a leader in water conservation in Colorado and the country.

1.0 Profile of Existing Water Supply System

The City of Aurora is the third largest city in Colorado and is anticipated to grow at a rate of 1.4% over the planning horizon of this report. The city's water utility, Aurora Water (or Aurora), is in the process of developing its first Integrated Water Master Plan (IWMP) to ensure that the water demand of customers continues to be met at a reliable and safe level now and into the future.

Aurora's water system serves the population and water needs within the municipal boundaries of the city, which spans portions of Adams, Arapahoe and Douglas counties (Appendix A). Additionally, Aurora provides some raw and/or potable water services to entities outside of its municipal boundaries, including Roxborough Water & Sanitation District, Dominion Water & Sanitation District, the South Metro WISE Authority, and through several leases. As of 2015, Aurora Water serves approximately 351,200 people with approximately 79,000 connections. The majority of accounts serve single-family detached units with the remainder serving single-family attached, multi-family, commercial, municipal and irrigation only units.

1.1 Overview of Existing Water Supply System

The City of Aurora began developing an independent water system in the early 1950s. Aurora relied upon another water provider, Denver Water, for the majority of the City's supply until the 1960s. The City Council at that time showed incredible foresight by dictating several policies as guidelines for the development of the system. First, Council directed staff to advance water supply projects in several basins because Colorado has climatic variability across the state. Second, Council requested that the system depend primarily on renewable surface supplies. They felt that the use of non-tributary groundwater should only occur in times of great need, such as drought. Lastly, Council directed that the system should fully operate without restriction through a drought of similar duration and intensity as the one Aurora experienced in the 1950s.

In the 1950s, Aurora Water established alluvial wells along Cherry Creek as the beginning of an independent system. In the ensuing years, Aurora acquired significant surface water rights, entered in to numerous operating agreements and constructed various pipelines, reservoirs, and water treatment plants to create a water system able to meet the City's water needs consistent with Council goals. A simplified illustration of the current raw water supply system is in Appendix B.

Aurora designed its raw water system to provide highly reliable service. Aurora depends on renewable surface water for approximately 95 percent of its raw water supply. The remainder comes from groundwater. Aurora maintains diverse and high quality sources of water supply in three major river basins: the Colorado, the Arkansas, and the Upper South Platte (Figure 1). Facilities in the Colorado Basin include the Homestake Project, the Busk-Ivanhoe system, the Columbine Ditch and the Twin Lakes Reservoir and Canal Company's transmountain diversions. In the Arkansas Basin, Aurora has interests in Turquoise Reservoir, Twin Lakes, Lakes Meredith and Henry, variable storage in

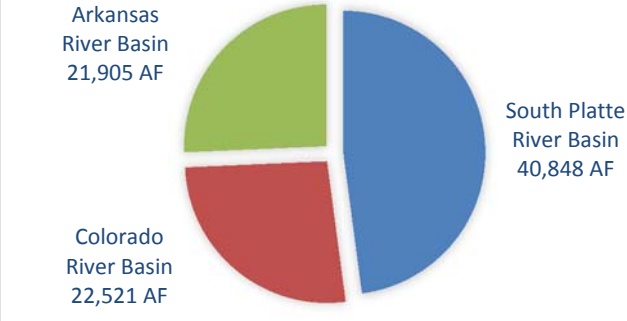


FIGURE 1: AVERAGE YIELD BY BASIN 2009 – 2013 (SYSTEM TOTAL 85,274 AF)

Pueblo Reservoir, and former irrigation rights from the Rocky Ford Ditch, the Colorado Canal, and two ranch transfers. The Otero Pump Station and Homestake Pipeline deliver water from both the Colorado and Arkansas basins to the South Platte basin. Aurora's South Platte Basin water rights are predominantly transferred irrigation rights out of South Park and the Upper South Platte River. Other facilities and supplies include Spinney Mountain Reservoir, Aurora Reservoir, Strontia Springs Reservoir, Jefferson Lake, Quincy Reservoir, Rampart Reservoir, Last Chance Ditch Company shares, the Prairie Waters system, and groundwater supplies.

Aurora diverts water from Colorado's streams and aquifers in a manner prescribed by water right decrees adjudicated by Colorado's Water Courts. Aurora owns or leases water that is subject to 50 decrees that include over 150 individual water rights. In order to manage these water supplies, real time access to rapidly changing stream flows in a wide geographic area is essential. Aurora has made substantial capital investments in remote sensing technology including over 20 data collection platforms that access satellite systems to relay current information to City's water control centers. The delivery of real time stream flows and supplemental data is vital to the protection and administration of Aurora's water rights.

TABLE 1: CITY OF AURORA AVERAGE YIELDS BY BASIN AND PROJECT, 2009-2013

System Total	***85,274 AF***
Colorado Basin	***22,521 AF***
HOMESTAKE	12,586
BUSK IVANHOE	1,914
TWIN LAKES TRANSMOUNTAIN	2,489
COLUMBINE DITCH TRANSMOUNTAIN	532
LONG-TERM PUEBLO LEASE	5,000
Arkansas Basin	***21,905 AF***
TWIN LAKES NATIVE	210
BUFFALO & BURROWS	370
HAYDEN & SPURLIN SHAW	931
COLORADO CANAL	5,621
ROCKY FORD DITCH	9,035
ROCKY FORD II	5,738
South Platte Basin	***40,848 AF***
RIGHTS ABOVE SPINNEY	23,249
TARRYALL BASIN RIGHTS	5,437
RIGHTS AT STRONTIA	3,859
JUNIOR LOWER SP RIGHTS	2,190
PWP PUMPING AT WELLFIELD	4,176
EXCHANGE TO STRONTIA	387
GROUNDWATER	1,550

Raw Water Yield and Losses

Figure 1 shows the average basin distribution of the City's raw water system yields over the last five years. Table 1 summarizes the city's raw water yields by basin and project.

Raw water system losses occur when water is stored or transported via a natural stream. State Water Commissioners administer Colorado water rights and deduct stream transit losses when a stream is used to transport water. For example, a 6% transit loss charge applies to releases from Spinney Mountain Reservoir to its intake at Strontia Springs Reservoir.

Aurora operates its system to minimize these losses as much as possible. The largest loss is due to reservoir evaporation and seepage. Evaporation from Spinney Mountain Reservoir and Aurora Reservoir alone account for over 8,000 acre-feet (AF). In general, evaporation is less at higher altitude reservoirs so Aurora holds its water as high in the system as possible. However, this must be balanced against the increased reliability attained from storing water as close to the City as possible (e.g., Aurora Reservoir). The system is managed to enhance operational flexibility.

Recent System Improvements - Prairie Waters

Following the drought of 2002-2004, Aurora needed additional raw water supplies to improve the reliability and yield of the system, as well as provide for increased future demand. After analyzing 53 proposed projects, Aurora selected the Prairie Waters (PW) project. Construction work began on PW in 2007 and finished in 2010. PW provides an additional raw water supply, which drought-hardens the existing water portfolio, through already decreed fully reusable water rights. This system collects, stores, and pumps water from the South Platte River downstream of Brighton, Colorado, back to Aurora for additional reuse. PW consists of a riverbank filtration collection, an aquifer recharge and recovery system, three pump stations, a 34-mile 60-inch diameter pipeline, a state-of-the-art water treatment facility (Binney Water Purification Facility) and a finished water pump station for distribution to customers.

TABLE 2: AURORA WATER'S RAW WATER STORAGE AS OF 2014

Reservoir	Aurora's capacity in AF	Normal Storage Capacity in AF	Built
	Colorado River Basin 25% of Aurora's water supply		
Homestake Reservoir	21,441	43,600	1967
	Arkansas River Basin 25% of Aurora's water supply		
Turquoise Lake	20,000	129,432	1968
Twin Lakes	2,733	141,000	1978
Pueblo Reservoir	10,000	357,000	1975
Lake Henry/Lake Meredith	9,896	48,765	Natural lakes
	South Platte River Basin 50% of Aurora's water supply		
Aurora Reservoir	31,679	31,679	1990
Quincy Reservoir	2,693	2,693	1973
Strontia Springs Reservoir	700	7,700	1981
Spinney Mountain Reservoir	53,651	53,651	1981
Jefferson Lake	2,313	2,313	1909
Rampart Reservoir	1,295	1,295	1967

The primary sources of water utilized by PW are various existing raw water supplies owned by Aurora. Aurora has the right to recapture water imported from the Colorado and Arkansas basins, and from most of the converted agricultural rights in the South Platte basin. Aurora also has the right to recapture and reuse lawn irrigation return flows (LIRFs), water not consumed after landscape application that percolates through the alluvium terminating in the stream. In the future, the city will expand PW, purchase, lease or otherwise obtain additional raw water supply sources, such as agricultural water rights and new conditional water right appropriations, and potentially engage in partnerships with other providers, as determined by future demand projections.

Storage, Treatment, and Distribution

Aurora currently has a storage capacity of over 150,000 AF in 12 reservoirs and lakes (Appendix B). The reservoirs serve to make the water system more efficient in the management of its yields, which vary seasonally and annually. Table 2 shows the storage capacity of each reservoir and lake.

Aurora Water's distribution system consist of over 1,800 miles of pipeline, nine booster pump stations and eleven finished water holding tanks. Aurora's service area consist of eight pressure zones, the majority

of which are gravity fed. Aurora Water currently operates three potable water treatment facilities: Griswold, Wemlinger, and Binney. Griswold and Wemlinger each have a capacity rating of up to 80 million gallons a day (MGD), while Binney can supply up to 50 MGD. Due to operational constraints, the combined max day rate is 150 MGD[1]. In order to meet peak demand projections in the future, one or more of these plants will be expanded. Aurora Water also operates one reuse facility: Sand Creek Water Reclamation Facility (Sand Creek). Sand Creek currently provides approximately 500 million gallons per year of reclaimed water to parks and golf courses throughout the city.

A regional district, the Metropolitan Wastewater Reclamation District (Metro), treats a majority of Aurora's wastewater. The Aurora wastewater collection system includes over 1,000 miles of pipeline, three major interceptors, and ten lift stations. The Aurora wastewater collection system also includes various interties and agreements with bounding districts that jointly make the best use of infrastructure discharging to Metro.

Aurora is currently developing its first Integrated Water Master Plan (IWMP). The IWMP combines all the diverse long-term water system planning efforts of Aurora Water under one cover that uses a common foundation for future water demand projections. The IWMP is scheduled for completion in late 2015. The planning horizon for the IWMP is 2070, with updates planned on a three to five-year basis. The IWMP process includes supply, treatment, distribution, reuse and the need for additional storage. It is highly likely that Aurora's projections for future acquisitions, storage, treatment, and demand will change with the implementation of the IWMP.

1.2 Water Supply Reliability

Aurora strives to create a water supply system that is reliable, resilient, and sustainable. While the Metro basin is anticipating a water supply gap by 2050[2], Aurora Water has already identified projects to meet demand through that time. Aurora uses the Central Resource Allocation Model (CRAM), to calculate firm yield, determine system reliability, and project future water supply. CRAM uses factors such as historical hydrology, water right decrees, evaporation and infrastructure to simulate Aurora's supply system.

Aurora's 2014 firm yield, estimated using CRAM with conditions similar to the design drought of record, is 63,500 AFY (20,700 MGY) of water delivery to its treatment facilities. Currently, Aurora uses the three-year drought of record that occurred in the mid-1950s as the design drought of record. Aurora is working on a Water Resources Plan, as part of the IWMP, which will expand the drought of record by using paleohydrologic records in addition to gauged historic flows. However, because droughts differ in terms of duration and intensity, Aurora has also developed drought response plans to increase system reliability.

Aurora Water's Water Management Plan (WMP) allows flexibility in declaring drought conditions and implementing mitigation. System vulnerability and water supply forecasting are estimated using CRAM as well as other factors. Aurora also ensures reliability by keeping a storage reserve equal to one year's demand as a safety factor. The safety factor and emergency safety factor policy is under review in the IWMP and will be updated as system performance metrics are tested in the future.

As population grows, so does the demand placed on the system. Therefore, Aurora also uses CRAM, coupled with future potential projects, to determine the amount of water that can be sustainably

[1] Aurora Water. 2012. Treatment Master Plan. Englewood, CO: CH2MHILL, INC.

[2] Camp Dresser & McKee Inc. 2011. Colorado's Water Supply Future: Colorado Water Conservation Board SWSI 2010.

withdrawn from the system in order to provide sufficient and reliable water to Aurora citizens. This "firm yield" of the system will continue to increase through additional infrastructure and acquired or expanded water rights.

TABLE 3: WATER SUPPLY NEEDS AND LIMITATIONS

Limitation and/or Future Need	Yes	No
System is in a designated critical water supply shortage area	X	
System experiences frequent water supply shortages and/or emergencies		X
System has substantial non-revenue water		X
Experiencing high rates of population and demand growth	X	
Planning substantial improvements or additions	X	
Increases to wastewater system capacity anticipated	X	
Need additional drought reserves	X	
Drinking water quality issues		X
Aging infrastructure in need of repair	X	
Issues with water pressure in portions of distribution system		X

Beginning in 2016, Aurora will begin deliveries under the Water Infrastructure and Supply Efficiency partnership, or "WISE". WISE is a water delivery agreement resulting from a cooperative project between the City of Aurora, Denver Water, and the South Metro WISE Authority (South Metro). One of the primary goals of WISE is to reduce South Metro's dependence on nonrenewable groundwater with periodic excess supply from both Aurora and Denver, delivered through unused or underused capacity in PW. Water deliveries to South Metro will begin with a phased implementation schedule in 2016, with full implementation of the partnership agreement in 2021 that will provide an average of 10,000 AF per year of treated water to the WISE Authority members.

1.3 Supply-Side Limitations and Future Needs

Water driven limitations for future development exist across the Front Range and Aurora is no exception. There are many limitations and future needs that will need to be addressed as the City continues to grow including those related to population, substantial water and wastewater system improvements, drought reserves, and aging infrastructure (Table 3).

Colorado Water Conservation Board's (CWCB) Statewide Supply Initiative (SWSI) 2010 Report projects a significant water supply gap for the Metro Basin M&I water sector by 2050[3]. However, Aurora has identified water supply needed through 2050. The IWMP is currently analyzing future water supply options through 2070.

While droughts and future climate variability will continue to stress the system, and while Aurora will periodically face drought restrictions, emergency water supply shortages are very infrequent. Aurora Water's robust drought response actions include the WMP, drought planning, drought response activities, and this water efficiency plan.

Distribution system water loss and other non-revenue water will continue to be an issue as the City ages and grows. However, Aurora Water has been very proactive in this area. With low rates of loss, Aurora

[3] Camp Dresser & McKee Inc. 2011. Colorado's Water Supply Future: Colorado Water Conservation Board SWSI 2010.

Water will continue to be a national leader in water loss control with very proactive water loss control and leak management detection control programs.

The population projection for 2070 is 721,892[4]. Therefore, Aurora's planning process includes a very thorough review of population projections, planning and land use projections, water supply planning, and water resources supply projects. Given the projected increases in population and water demand, increasing pressure on future supply including climate variability, the effectiveness of water efficiency programs, economic drivers, and other uncertain future conditions, Aurora is pursuing several future water supply projects and options across several planning scenarios.

Options being pursued to address the water supply gap projected by 2070 include multiple reservoir options, an expansion of Prairie Waters, partnerships, firming of conditional water rights, maximizing the efficiency of current water rights operations and exchanges, as well as continuing to be leaders in water conservation and reuse.

As demand increases, wastewater infrastructure will respond accordingly. Aurora owns and operates limited reuse treatment (Sand Creek) and utilizes Metro for treatment of all solids. Some potential for increasing reclaimed wastewater reuse exists and is being investigated through the IWMP. With new development, Aurora is constructing interceptors and lift stations, as needed per previous master plans. Aurora is also working closely with Metro, Arapahoe County and Denver on a northern interceptor as an option for lifting wastewater to a new regional treatment facility being constructed north of Brighton, Colorado. An updated wastewater master plan is anticipated for 2015/2016.

As our water system expands, Aurora is required to construct additional finished water storage reservoirs sized for ultimate build-out of water treatment facilities. If not operated properly, this could lead to water age concerns in those storage reservoirs. Currently, there are few isolated areas of water age over the system average of four days. Aurora manages water age in storage tanks by operating at a lower tank water surface elevation during the low demand months, mainly winter. In some instances, tank mixers have been installed. In addition, Aurora regularly monitors water quality through its extensive water quality testing program. Development standards include restrictions for properties served by dead end lines and consideration of water age when reviewing proposed master utility plans submitted by developers.

Aging infrastructure signifies a need for Aurora to maintain its assets, as a large amount of infrastructure constructed in the 1960s, 1970s, and 1980s may be reaching the end of its useful life. This is true for the water, wastewater and stormwater systems. Various condition assessment projects have been initiated for major infrastructure and some of the more susceptible pipe materials throughout the three utilities. Susceptible pipes includes stormwater reinforced concrete pipes, corrugated metal pipes, and concrete channels. The assessment of some sewer interceptors and raw water pipelines has occurred recently. Sewer lines are inspected for condition on a ten-year cycle. An annual water transmission pipe replacement program is underway, as are multiple capital improvement projects for the major needs identified in the condition assessment projects. Aurora anticipates that a comprehensive asset management plan will be required in the coming years in order to prioritize condition replacement/rehabilitation and to ensure that the current level of funding allocated is sufficient.

[4] BBC Research. 2015. Water Demand Forecasts for Integrated Water Master Plan. Denver, CO.

Aurora does not currently have any significant issues regarding pressure in portions of the distribution system. Water pressures throughout the distribution system fall between 40 pounds per square inch (psi) and 135 psi. When new development comes in, evaluation of the system for the ability to provide adequate pressures and fire flows occurs. As the system grows and expands, Pressure Reducing Valves (PRVs) or pumps zones may need to adjust in order to provide suitable pressures. Proper rehabilitation and replacement of infrastructure will be needed in order to ensure the pressures do not decrease with anticipated scaling. By maintaining adequate major infrastructure, as is being evaluated in the IWMP, and continuing to ensure adequate pressures during development, no major concerns are present for the transmission and distribution system as development increases. However, to maintain appropriate pressures, rehabilitation and replacement actions need to be prioritized, which will be addressed in the upcoming asset management plan.

2.0 Profile of Water Demands and Historical Demand Management

2.1 Demographics and Key Characteristics of the Service Area

Aurora's history is one of change, growth, diversity and community. Aurora originally incorporated as the town of Fletcher on April 30, 1891. This new town lay just east of the City of Denver on four square miles along Colfax Avenue. In 1907, the town renamed itself Aurora. Since then, Aurora has grown to a city of over 350,000 residents. In the coming years, Aurora expects to experience one of the highest growth rates in the Front Range. The Planning Department projects that Aurora could reach over 500,000 residents by 2040 (Figure 2).

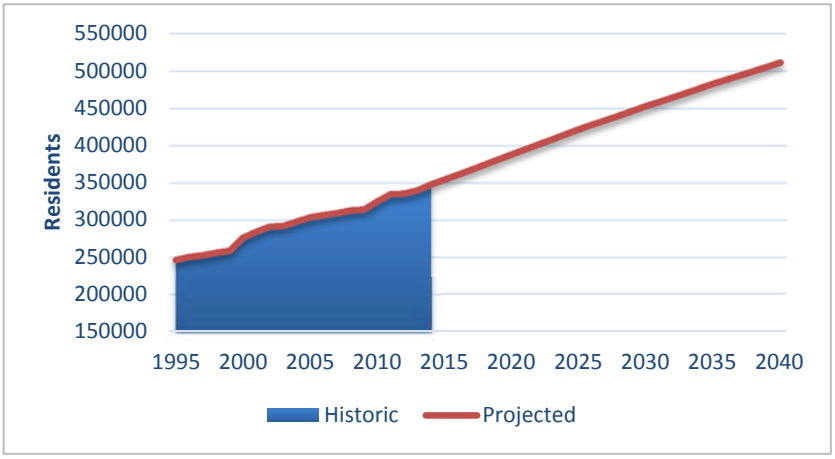


FIGURE 2: OFFICIAL AURORA POPULATION GROWTH PROJECTIONS

Aurora's average household size is currently 2.65 persons per dwelling unit. The percentage of family households with children has declined 10.7% in the past 20 years. This trend mirrors the regional and national trend of family households comprising a smaller percentage of total households. Even so, Aurora is still a "young" city, with a median age of approximately 33 years (compared to Colorado's average of 36 years), and Aurora has the highest percentage of children under the age of five in the Metro region. Aurora is also one of the most diverse cities in the Metro region, with over 30% of residents reporting they speak a language other than English at home[5].

Relative to peer Denver Metro cities, household income levels have been declining since 1980. Aurora's median household income is $51,048, making Aurora one of the lowest-income cities in the Metro region[5]. However, Aurora's mean family income varies drastically by census tract; the majority of low-income

[5] City of Aurora Planning and Development Services Department. 2012. Who is Aurora? An overview of demographic and social data and trends. Aurora, CO.

families live west of Interstate 225 and the majority of medium and high-income families live in areas of new development in southern and eastern Aurora.

Approximately 60% of Aurora's housing is single-family dwellings (51.2% detached, 9.9% attached), almost 38% is multi-family dwellings and 1.5% is mobile or group homes[6]. While Aurora is primarily a suburban community, developers are planning to create dense urban centers along the Interstate 225 corridor where a light rail system is currently under construction. These dense urban centers will likely increase the percentage dwelling units that are multi-family. Around 40% of the existing dwelling units in Aurora are renter-occupied[6]. Renter-occupied housing typically adapts slower to water efficiency measures than owner-occupied housing. The City's median home value is $179,400[7]. Historically, higher home values in Aurora strongly correlate with increased indoor and outdoor water use[8].

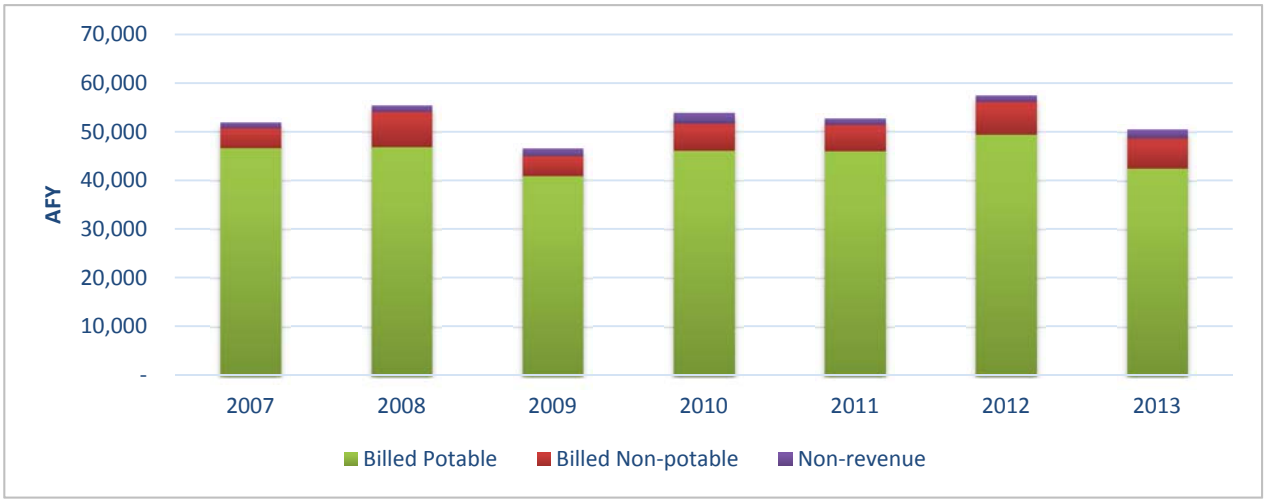
Approximately 70% of the housing stock in Aurora is older than 1994, the year that 1.6 gallon-per-flush (gpf) toilets were federally mandated[9]. However, water efficiency retrofits are occurring. A 2014 survey of 1,000 residential customers showed that the majority of customers have replaced at least one water-using fixture (Table 4)[8]. In addition, a recent saturation study conducted by Maddaus Water Management estimates that only approximately 17% of residential and multi-family toilets in Aurora use more than 1.6 gpf[9].

TABLE 4: HOUSEHOLD WATER DEMAND SURVEY

Fixture	Respondents that replaced at least one fixture.
Toilet	48%
Showerhead	69%
Aerator	55%
Washer	58%

2.2 Historical Water Demands

Historic water demand for Aurora is shown in Figure 3. On average, 40% of Aurora's demand is for outdoor use, which accounts for the reduction in demand in 2009, a relatively wet year, and the increase in demand in 2012, a drier year. The five-year average of billed potable consumption is 44,962 AF. While the population in Aurora has grown since 2007 the average system-wide water demand, comprised of potable, non-potable, and non-revenue water, has not.



[6] City of Aurora Department of Planning.2014. Aurora Facts 2014. Aurora, CO.
[7] Census Bureau. 2014. State and County QuickFacts: Aurora (city), Colorado.
[8] BBC. 2014. *Aurora Household Survey*. Denver, CO.
[9] Maddaus Water Management. 2015. Aurora Water Conservation Technical Analysis. Danville, CA.

Non-potable water demand includes both raw and reclaimed water. The primary use for non-potable water is municipal outdoor irrigation in areas including parks and golf courses. Aurora is examining other uses for non-potable water through the IWMP. Non-revenue water includes unbilled metered, unbilled unmetered, and apparent and real losses. For this report, non-revenue water is estimated as the difference between the total water treatment plant production and the total billed water.

Potable water in Aurora is distributed to four customer classes: single-family residential (less than five units), multi-family residential (five or more units), commercial, and irrigation only. Historically, single-family residential customer's account for 45% of system demand (Table 5). Monthly water demand by customer class for 2014 can also be seen in Table 5. In 2014, the peak demand occurred on July 8th. The demand reached 78.27 MGD, the five-year average peak demand is 83.15 MGD (Figure 4). Peak demand has reduced since 2000 (111.45 MGD) due to the installation of automated irrigation systems and mandatory three day a week water restrictions in non-drought years. Therefore, peak demand reduction is not a primary objective of this plan.

TABLE 5: AVERAGE MONTHLY AND ANNUAL DEMAND BY CUSTOMER CLASS

Customer Category	Commercial	Irrigation	Multi-family	Residential
Jan	515	0	805	1,133
Feb	500	0	732	1,036
Mar	520	1	719	1,001
Apr	527	13	722	1,053
May	759	200	910	1,358
Jun	1,059	539	1,083	1,939
Jul	1,385	886	1,349	2,738
Aug	1,250	771	1,208	2,258
Sep	1,107	611	1,190	2,138
Oct	945	406	964	1,770
Nov	562	64	728	1,183
Dec	506	2	774	1,085
Average Demand By Customer Class (2010-14)	**21%**	**9%**	**25%**	**45%**

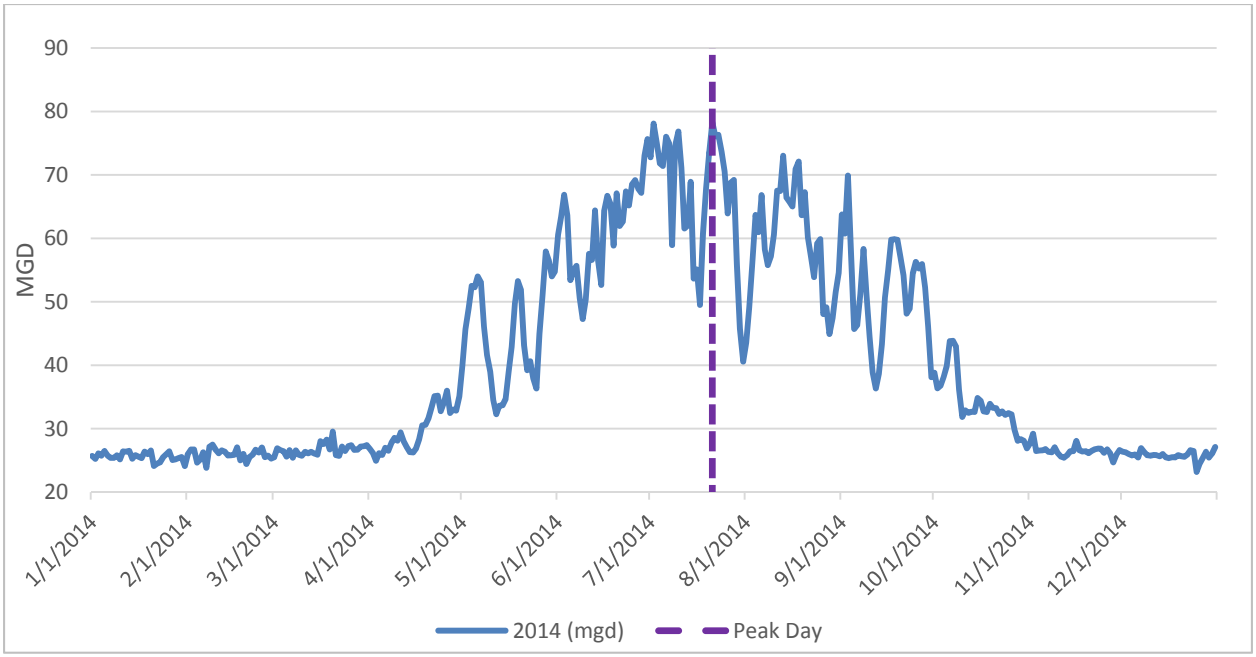


FIGURE 4: 2014 DAILY AND PEAK DEMAND

System Water Losses

Aurora Water has conducted annual water loss audits using American Water Works Association (AWWA) M36 methodology since 2012. In 2013, an estimated 36 million gallons (MG) of apparent losses and an estimated 222 MG of real losses occurred.

Largest Water Users

The largest customers in Aurora in terms of annual water use are:

- City of Aurora
- Aurora Public Schools
- University of Colorado Denver
- Buckley Air Force Base
- Cherry Creek Schools
- Heather Gardens HOA
- Starr Bridget Chelsea LLC
- Westdale Asset Management
- Tallyn's Reach Metro District
- Medical Center of Aurora

In aggregate, these users account for 9.6% of the total billed metered potable water sales in 2013. In 2014, Aurora Water developed a CII pilot program to address these users and the top 150 individual metered users. An analysis of the top 150 users showed that, in addition to the largest customers referred to above, Aurora Water should also analyze customer usage for potential efficiency improvements in the following categories: industrial, hospitality, fueling stations, laundromats, assisted living homes, retail, grocery, HOAs, office buildings, restaurants, car washes, and shopping centers.

2.3 Past and Current Demand Management Activities and Impact to Demand

2007-2014 Water Efficiency Evaluation

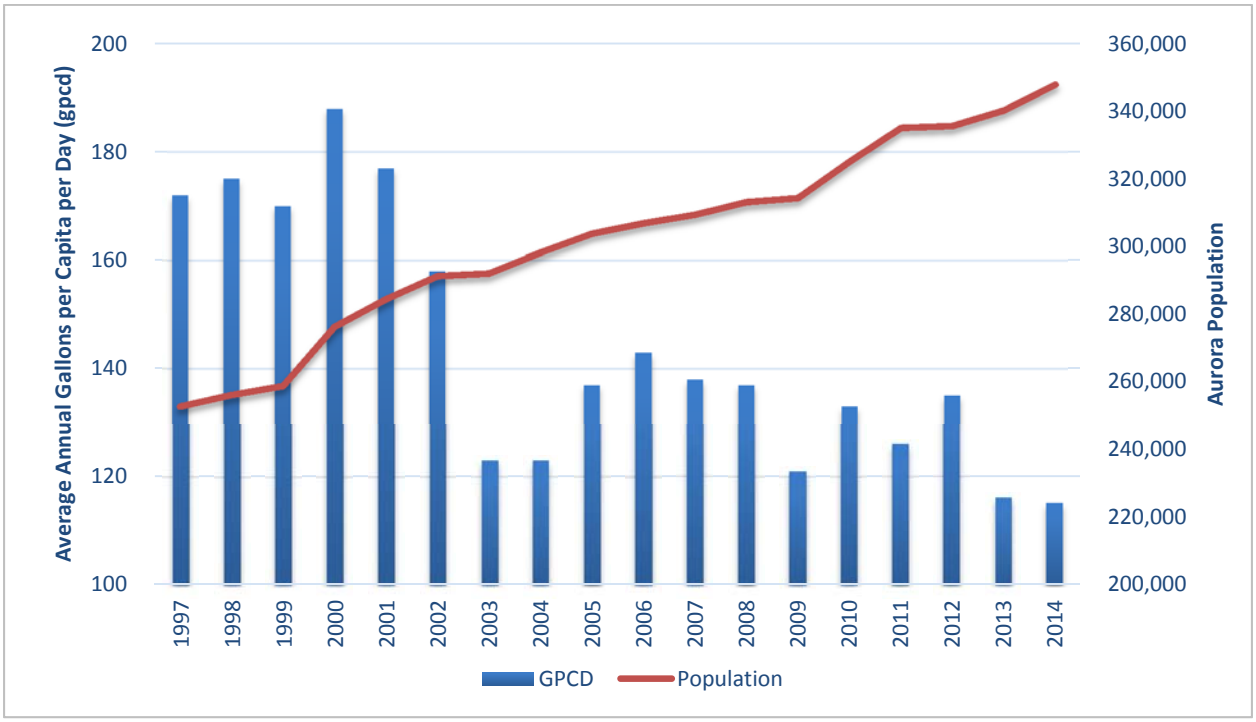


FIGURE 5: AURORA WATER – DISTRIBUTION GPCD

In 2007 Aurora submitted its first conservation plan to the CWCB. The plan outlined a per capita demand reduction goal of 10% from the 2007 GPCD (138 GPCD) over 25 years. GPCD is measured as the amount of water leaving the treatment plant divided by the total population and number of days. Aurora Water has already achieved this reduction on a yearly basis (2014's GPCD equaled 115), and a 9% reduction on a five year average basis (125 GPCD)(Figure 5). Section 3.2 contains Aurora's new conservation reduction goals.

Aurora achieved a GPCD reduction through both passive and active demand management activities. Aurora Water estimates that approximately 67 MG in demand reduction was due to passive savings in 2014. Aurora used the Decision Support System (DSS) model, with current saturation and market penetration inputs, to calculate these savings (Appendix C).

Active demand management activities include the conservation measures listed below Figure 6. The year of implementation is also listed next to each measure. Additionally, rate changes and environmental and economic conditions have influenced demand over the last seven years. The most current rate schedule can be seen in Appendix D and the increase in residential water rates since 2007 can be seen in Figure 6.

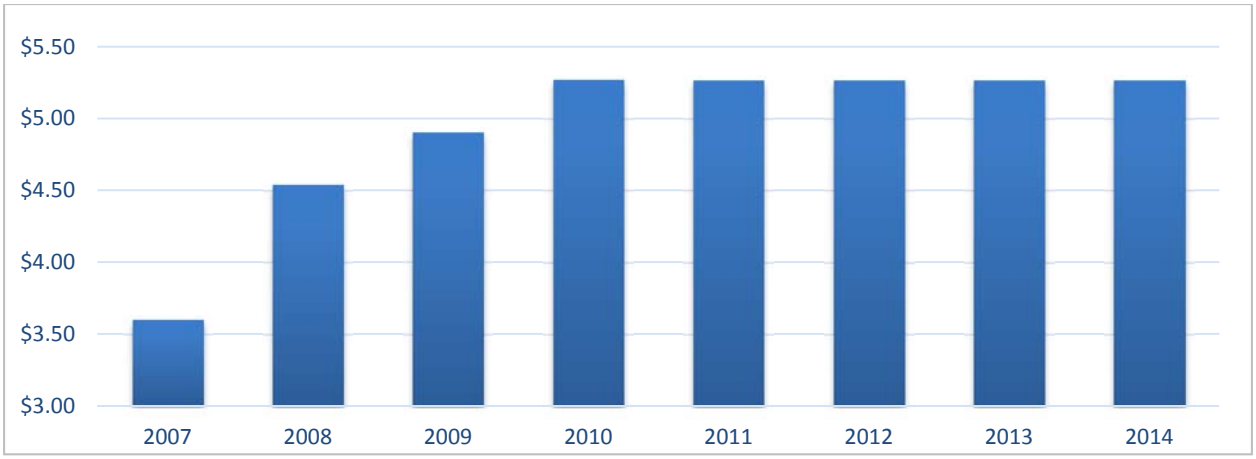


FIGURE 6: SINGLE-FAMILY RESIDENTIAL RATES PER 1,000 GALLONS

Current Demand Management Activities

- Leak Loss & Detection, 1986
- School (Youth) Education, 1994
- Youth Water Festival, 1994
- Water Wasting Ordinance, 2000
- Toilet Rebate, 2003
- Aurora Xeriscape Demonstration Garden, 2003
- Citizen Water Advisory Committee (CWAC), 2003
- Irrigation Plans Review, 2004
- Soil Amendment Requirements, 2004
- Landscape Permit (includes rain sensor requirement), 2004
- Water Conserving Landscape Code, 2004
- Water Smart Reader, 2004
- Car Wash Certification, 2004
- Adult Conservation Classes, 2004
- Xeriscape Volunteers, 2005
- Irrigation Rebate, 2005
- Irrigation Audits, 2006
- Forests to Faucets, 2006
- Leak Adjustment Credit, 2007
- Indoor Water Audits, 2007
- Xeriscape Rebate, 2007
- Online Conservation Calculator, 2008
- 1-on-1 Landscape Design Consultations, 2009
- H2O Outdoors, 2010
- Community Gardens Program, 2011
- Low-Income Water Efficiency Program, 2011
- Excellence in Xeriscape Award, 2013
- Watering Variance, 2013
- Water-Smart Landscape Contractor Training, 2013
- H2O Tracker Smartphone App, 2013
- Single-Family Tap Fee Credit, 2014
- Z-Zones, 2014

Since implementing the first education class in 1994 to advertising the H20 Tracker app, Aurora Water has continuously attempted to use lessons learned to make measures more efficient. A breakdown of lessons learned from 2007 to 2014 and subsequent improvements, are listed below for education, outdoor, indoor, and analysis programs:

Outdoor:

- Irrigation rebates have been itemized to make the measure more customer oriented. Aurora Water also now absorbs more of the irrigation replacement part cost to incentivize customers to make the switch.
- The irrigation audit program moved from consultant based auditors to in-house auditors in order to better promote the irrigation rebate and to build more lifelong community partnerships.

- Xeriscape rebate requirements changed to ensure that water savings would be achieved because of program participation (for example only healthy turf to xeriscape is rebated).
- Online applications were created for both rebates to make the process easier for customers.

Education:

- Online forms were created for youth education programs to streamline program registration, presentation request, and satisfaction surveys. Survey feedback increased significantly as a result.
- In Forests to Faucets, deposits are now collected in advance to make a reservation and refunded when the teacher attends the workshop.
- Smarter decisions on which events to attend helps maximize outreach efforts with minimal staff time.

Indoor:

- The toilet and washer rebate program has continually been adjusted to maximize the benefit to the utility, yet encourage the market to push for higher efficiency products.
- Indoor audit reports have evolved to provide more information to customers, allowing them to make informed decisions about their water use.
- Aurora created a low-income program to give those customers that previously could not afford to participate in rebate programs the opportunity to become more water efficient.
- An online application for the toilet rebate has been created to make the process easier for customers.

Monitoring/analysis:

- Return on Investment has become the standard with which to determine the success or viability of a program, instead of the earlier low hanging fruit approach.
- Detailed annual reports now provide critical evidence as to the necessity of a water conservation program.
- Comparing water use data against irrigated areas has allowed Aurora Water to contact the most inefficient water users in the City.

Historic Savings Calculations

Aurora Water has two methods for quantifying historic conservation savings. First, staff develops historical conservation savings for each measure using customer's consumption data from the years prior to and after their participation (Table 6). Second, staff examine customers that participated in the conservation program and compare their water consumption patterns to the rest of Aurora Water customers that have not participated in any programs (Table 7).

Table 6 displays individual measures where savings can be quantified, showing effectiveness using the following methodology:

- Indoor Measures. The winter quarter average (December, January and February water consumption) represents the monthly indoor water use of the customer and provides an estimate of a year's total indoor consumption. A savings estimate is provided by comparing the indoor consumption of a full calendar year before and after the year in which a customer participated in a measure.
- Outdoor Measures. Outdoor water use is assumed to only occur during months in which landscape is regularly irrigated (April through October). If, in each month, consumption exceeds the winter quarter average for that property, the winter quarter average is subtracted to isolate the outdoor water use for that month. The sum of the outdoor consumption for a year is multiplied by a normalizing coefficient, to adjust for the plant demand of weather conditions year to year. Total outdoor water use for the year after measure participation is subtracted from the year before participation to show estimated outdoor savings.

TABLE 6: WATER SAVINGS BY PROGRAM FROM 2002-2012

Year	Toilet Rebate	Clothes Washer Rebate	Both Washer/Toilet Rebate	Indoor Audit	Water Smart Reader	Low Income Fixture Replacement Inspection	Low Income Fixture Replacement Rebate	Car Wash Certification	Residential Irrigation Audit	Commercial Irrigation Audit	Residential Irrigation Rebate	Commercial Irrigation Rebate	Landscape Sitemap	Large Property Xeriscape Rebate	Residential Xeriscape Rebate	Total Savings
2002	-4	16	0	-	-	-	-	-	-	-	-	-	-	-	-	**12**
2003	56,052	8,656	872	-	-	-	-	-	-	-	-	-	-	-	-	**65,850**
2004	34,180	5,752	388	2,156	-	-	-	-872	-	-	-608	-159	-	-	-	**40,837**
2005	16,972	10,972	568	3,996	1,844	-	-	-636	-	-	-980	0	-	-	-	**32,736**
2006	-4,200	3,204	-268	1,968	-284	-	-	-244	-564	-76	-196	0	-	-	-	**-660**
2007	-3,052	2,888	260	-5,508	3,380	-	-	-28	300	1,361	110	1,741	-	1,718	-3,664	**-494**
2008	29,832	17,756	500	6,292	-460	-	-	536	2,742	0	23	-1,107	-	-1,114	1,437	**56,437**
2009	10,752	9,480	1,528	2,084	4,108	-	-	0	-629	0	38	-336	-410	0	3,801	**30,416**
2010	21,432	15,296	2,008	5,376	2,672	-	-	2,516	1,208	-3,684	-22	0	-1,007	5,050	436	**51,281**
2011	2,492	1,880	964	0	1,592	396	240	436	1,005	8,645	71	1,266	1,946	4,746	808	**26,487**
2012	14,112	-1,788	56	3,772	3,468	272	1,008	-2,912	3,829	32,949	190	1,744	6,185	13,663	659	**77,207**

The values shown in Table 6 represent thousands of gallons. Indoor programs are shaded purple, while outdoor programs are shaded green. Positive numbers show savings while negative numbers identify increased use. Several events can cause increased use such as an increase in family size or a new tenant. Customers that had no consumption the year before their participation were not included in savings analysis due to lack of comparative data.

TABLE 7: CUMULATIVE WATER SAVINGS FROM 2002-2012

Year	Estimated Savings (kgal)	Cumulative Estimated Saving (kgal)
2002	897	897
2003	65,927	66,824
2004	69,929	136,753
2005	73,706	210,459
2006	15,374	225,833
2007	11,644	237,477
2008	10,832	248,309
2009	15,225	263,534
2010	40,505	304,039
2011	37,338	341,377
2012	27,395	368,772

Indoor programs showed consistent savings in the tens of millions of gallons with the exception of 2006 and 2007. Multi-family meters caused the only negative savings for all indoor programs in 2006 and 2007, due to the inability to isolate the participant's use from other customers on the same meter. Rebates replacing toilet and washing machines yielded the highest savings of any measures overall.

Outdoor program savings did not demonstrate consistent trends from 2004 to 2009. This may be attributed to higher behavioral sensitivity to weather conditions. Policy changes in the xeriscape rebate measure occurred in 2009 and required applicants to have healthy existing turf in order to qualify for replacement. As a result, water savings have been achieved annually and continue to increase. Despite fluctuations in savings and increased use, all programs as a whole have shown significant annual savings increases from 2011 to 2012. Preliminary data from 2013 also shows a continued growth in savings by every outdoor program.

Table 7 takes a more holistic approach by looking at the cumulative savings of conservation over time. Aurora Water staff measure the average conservation participant compared to the average non-participant. Total savings are calculated using the following formula:

Cumalitive savings =

$$\sum\{[(WU_n * AWU_n) - WWU_n] + [(WU_{n+1} * AWU_{n+1}) WWU_{n+1}] + [(WU_{n+2} * AWU_{n+2}) - WWU_{n+2}] + \ldots\}$$

- **n** = 2002
- **WU** = Total water use for all audit,water smart reader, and rebate participants in **n** -1 year (thousand gallons/year)
- **AWU** = One minus the percent change in the average water use of all non-particiapnts from the previous year (thousand gallons/year)
- **WWU** = The water use for **WU'**s participants during **n** year

Overall, when participants were tracked relative to those that did not participate in any conservation measure they used less water as shown in Table 7. Several years after their participation customers still use less water than predicted compared to the average for Aurora. Using this methodology, an estimated 1,132 AF (369 MG) have been saved as a result of conservation since 2002.

2.4 Demand Forecasts

Aurora Water worked with BBC to complete an econometrics analysis of customer water use intensity since 2000[10]. BBC used this data to create equations that predict future demand, without accounting for additional water conservation or efficiency increases. Figure 7 shows the median demand forecast without non-revenue or treatment loss (BBC Median Forecast) from 2015 until 2040, the planning horizon of this report. Figure 7 also depicts the 90% upper and lower confidence intervals for the demand (BBC 90% CI range).

[10] Camp Dresser & McKee Inc. 2011. Colorado's Water Supply Future: Colorado Water Conservation Board SWSI 2010.

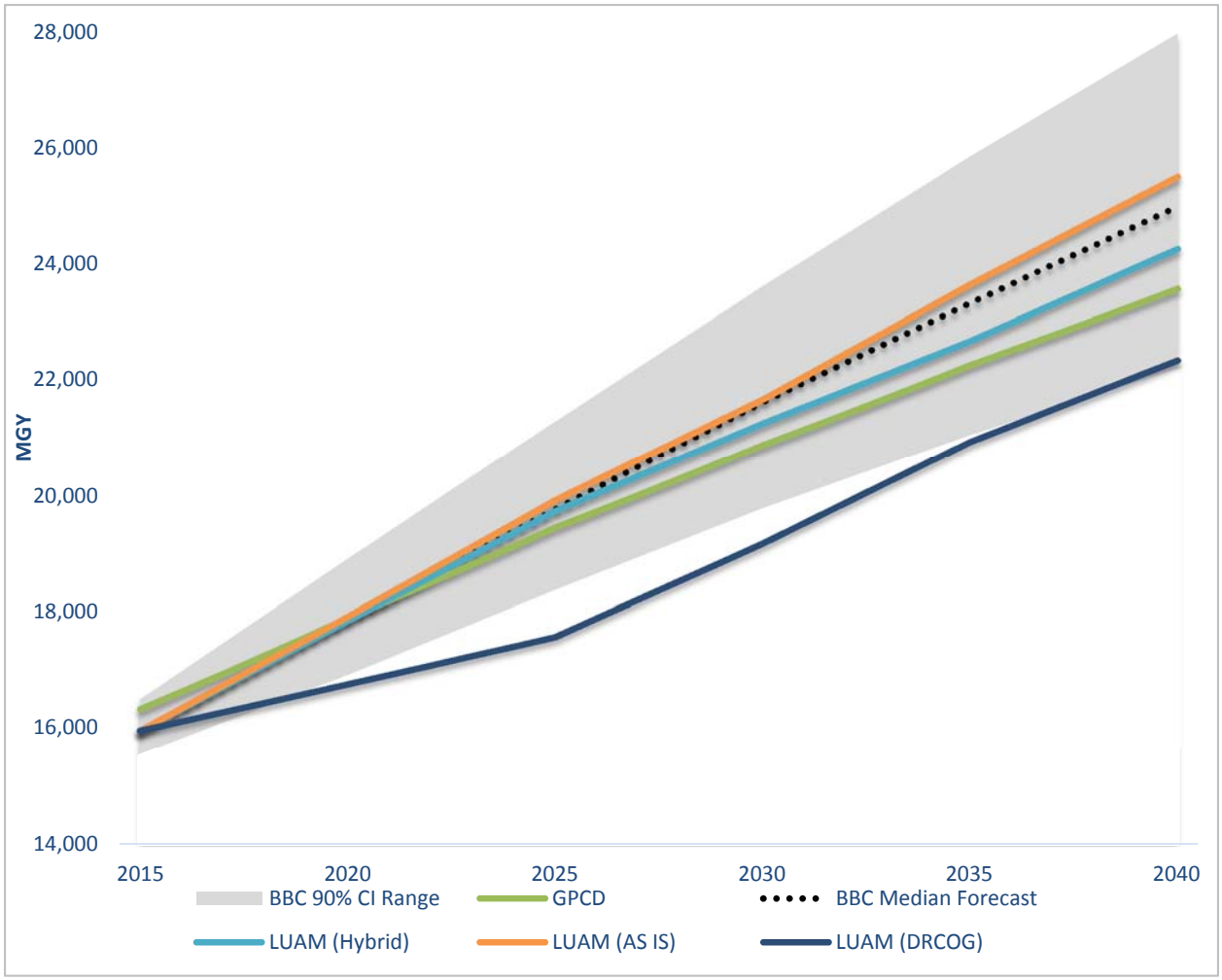


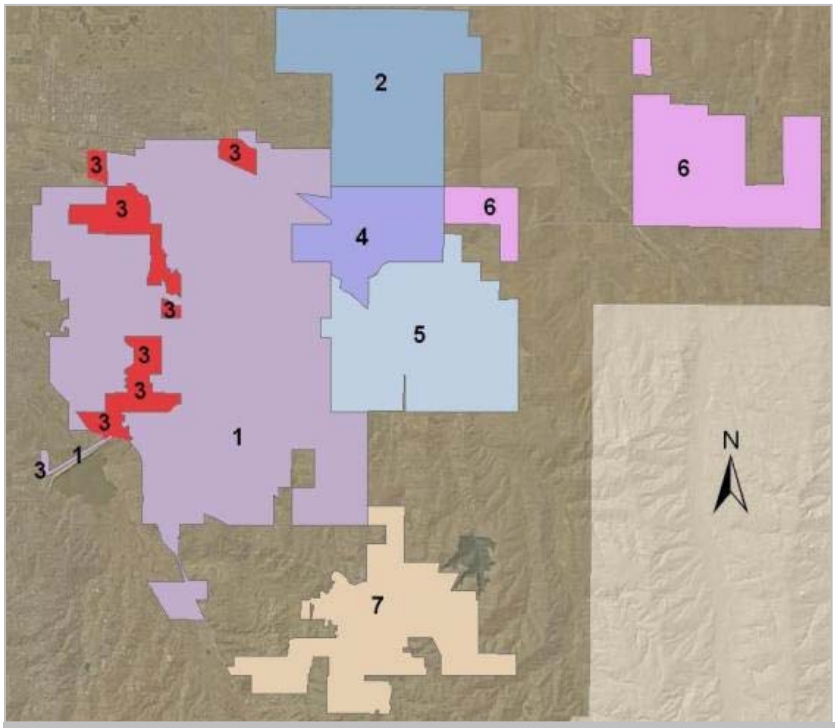
FIGURE 7: AURORA WATER DEMAND FORECAST SCENARIOS WITHOUT CONSERVATION

In addition to the econometrics forecast, Aurora Water worked with the Aurora Planning Department, Clarion Associates, and Western Resource Advocates to predict future water demand based on land use type with the Land Use Allocation Model (LUAM). The LUAM is a GIS based model developed by Aurora's Planning Department to distribute projected population and employment growth to vacant and known redevelopment land. The LUAM uses current zoning code density restrictions to calculate population and employment capacity for each vacant parcel at build out. Conservation utilized historic water use per square foot to compile a water demand for each Planning subzone. Subzones are planning designations that restrict different types of development by area. Subzone examples in Aurora include low-density single-family, mixed use, and open space. Clarion Associates tied subzones with no or incomplete historical water demand to subzones with water demand, in Aurora or in the Metro area, based on their breakdown of residential, commercial, and industrial density.

The LUAM user can assign growth percentages in the model to each subarea of the city in five-year increments. Aurora Water ran the LUAM using three different subarea growth percentages (Figure 8). The LUAM AS IS model run assumed historic growth patterns, observed from 2001-2010, to fill in vacant parcels. The DRCOG model run filled vacant parcels using DRCOG's Metro Vision[11] goal assumptions. The

[11] Denver Regional Council of Governments (DRCOG).2011. Metro Vision 2035 Plan. Denver, CO.

HYBRID growth assumptions were calculated for the IWMP by Aurora Water staff and the HYBRID run is most likely to occur based on current development trends. Conservation built a post-processing model to calculate water use for each vacant area and to summarize the results in five-year increments.



Subarea	AS IS	DRCOG	HYBRID
1	47%/66%	24%/20%	Hybrid percentage changes each five-year increment based on research completed by Aurora Water staff
2	3%/0%	2%/1%	
3	2%/20%	50%/75%	
4	0%/3%	0%/1%	
5	8%/0%	4%/0%	
6	0%/0%	0%/0%	
7	40%/11%	20%/3%	

FIGURE 8: LUAM SUBAREAS WITH GROWTH ASSUMPTIONS TABLE (RESIDENTIAL/NON-RESIDENTIAL) BY SCENARIO

As can be seen in Figure 7, the HYBRID and AS IS model outputs result in an almost identical water demand until 2025. From 2025 on the AS IS demand corresponds more closely to the econometrics model. This relationship is expected because the econometrics model uses historic water use intensity to predict future demand. The DRCOG run has a lower water demand prediction until 2025. From 2025 on, the DRCOG output resembles the trend of the other two model runs because there is no more high-density land available to fill in. The LUAM results are limited by the current assumptions of land available for redevelopment. As the three model runs project further out the projected demand becomes more similar because nearly all vacant land is consumed, and therefore land use type no longer matters.

This is the first time Aurora has attempted to predict demand based on land use type. Assuming no conservation or passive savings, the results forecasts approximately three billion gallons of water saved per year by 2040 if Aurora heavily promotes transit-oriented development over the suburban growth of the last decade. An estimated savings of one billion gallons a year by 2040 will occur if development follows the assumptions made in the HYBRID scenario instead of the AS IS growth scenario.

Overall, econometric and LUAM modeling are both more accurate ways of predicting future demand than the traditional method of using GPCD calculations as seen in Figure 7. Using the LUAM for demand projections also gives Aurora Water a context to discuss water savings that can be derived from transit-oriented development. Aurora anticipates future LUAM based demand projections will only become more accurate with a decrease in the variety of subzones in the 2017 planning code update.

3.0 Integrated Planning and Water Efficiency Benefits and Goals

3.1 Water Efficiency and Water Supply Planning

The IWMP process is utilizing both existing and projected water conservation savings to determine future demand. Conservation savings subtracted from econometric modeling projections create the official demand projections for the City (Figure 9)[12]. The combined estimated savings of the selected conservation measures is approximately 1,500 MGY by 2040. An additional 3,000 of savings is estimated due to passive savings. While Aurora Water plans to move forward with the selected conservation measures (Section 4), changes in development, water use intensity, or budget could cause a delay in implementation or an indefinite cancelation of any measure mentioned.

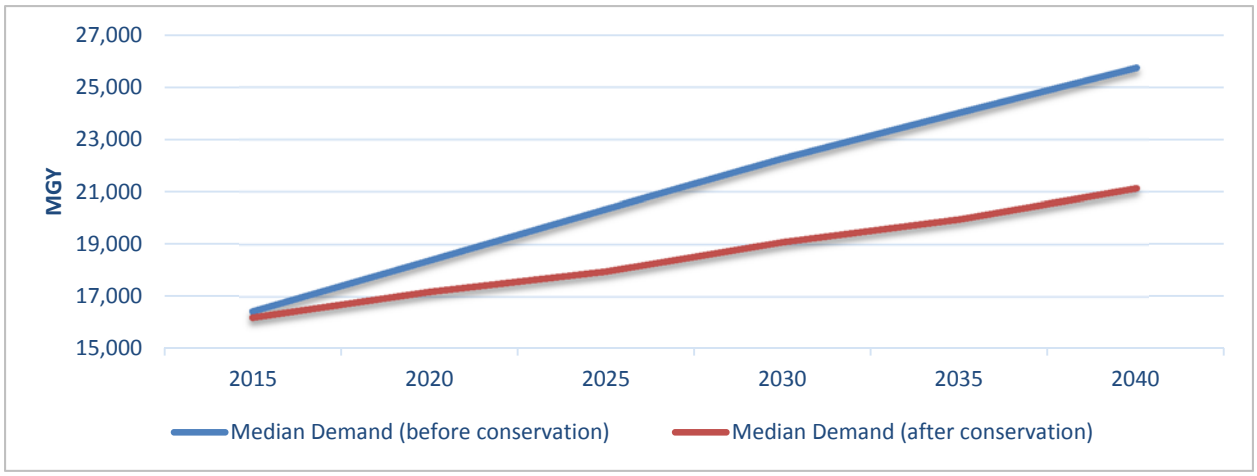


FIGURE 9: OFFICIAL SYSTEMWIDE DEMAND FORECAST WITH AND WITHOUT PLANNED CONSERVATION MEASURES

The official demand seen in Figure 9 determines the selection of future infrastructure projects and their respective designs. Current challenges to the system include not having enough existing supply or storage to support the ultimate build-out of the city. Conservation measures give Aurora the flexibility to postpone acquiring future water rights and infrastructure.

3.2 Water Efficiency Goals

Aurora Water strives to achieve a 10% reduction in GPCD by 2040. This goal is similar to the 2007 goal of a 10% reduction by 2032. Staff used the DSS model to confirm that a 10% reduction is an achievable goal and to estimate the breakdown of savings by customer class.

An estimated 45% of projected reductions will be due to a decrease in single-family residential water use intensity. The other customer categories and non-revenue water (NRW) reductions will achieve the remaining 55% of projected savings (Figure 10). To achieve a 10% reduction, Aurora Water Conservation has seven internal indicators that direct future actions and measure success on a qualitative basis.

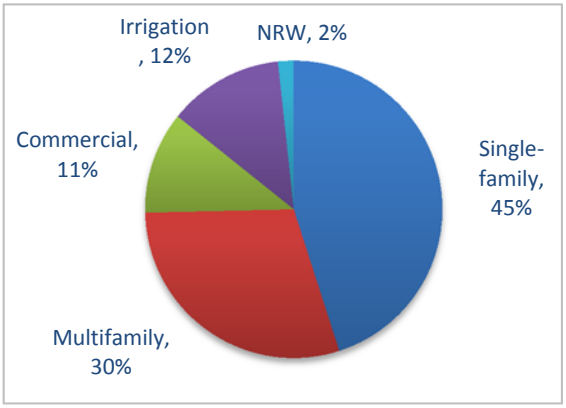


FIGURE 10: TARGETED WATER SAVINGS BY CUSTOMER CLASS AND NON-REVENUE WATER

[12] BBC Research. 2015. Water Demand Forecasts for Integrated Water Master Plan. Denver, CO.

Aurora Water Conservation Goals

1. Give customers tools to evaluate their own use and make efficiency improvements through fixture replacement or changes in usage patterns.
2. Expand the youth education program to include tailored classes for each grade level, including higher education, that convey the importance of water conservation, stewardship and pollution prevention.
3. Make conservation education actionable with incentives and audits.
4. Respond to drought in an efficient and effective manner.
5. Influence market transition towards more efficient fixtures and practices, accelerating change beyond local, state and federal codes.
6. Support local ordinances that promote water conservation through collaborations with other departments.
7. Partner with CII customers to create and meet benchmarks through tailored water efficiency programs.

4.0 Selection of Water Efficiency Activities

4.1 Summary of Selection Process

Aurora Water screened potential conservation measures in two stages. The first stage involved a team of Aurora Water staff completing a qualitative screening of 94 potential water efficiency measures using five metrics: service area match, long term/permanent water savings, quantifiable savings, customer acceptance and equity. The following is a description for each metric.

- Service Area Match. Is the technology appropriate for the area's climate, building stock, or lifestyle?
    - Example: Pool covers would be a poor fit for Aurora due to the low number of pools in the service area.
- Long Term/Permanent Water Savings. Are the measure's savings long term or permanent?
    - Example: The water savings of a customer who makes a behavior change is not as permanent as a customer that retrofits a toilet.
- Savings Quantifiable. Are the water savings measurable?
    - Example: Aurora can look at customer's use before and after a xeriscape rebate and get a good estimate on water savings. However, Aurora cannot know which customers walk through the xeriscape demonstration garden; therefore, there is no way to quantify savings.
- Customer Acceptance. Are customers willing to implement measures? Customer acceptance may be based on:
    - Convenience
    - Economics
    - Perceived fairness
    - Aesthetics
- Equity. Is the measure equitable? One category of customers should not benefit while another pays the costs of the measure without receiving benefits.
    - Example: Toilets are equitable for residential customers because every customer has a toilet. Evaporative cooler retrofits are less equitable because they would only assist some customers.

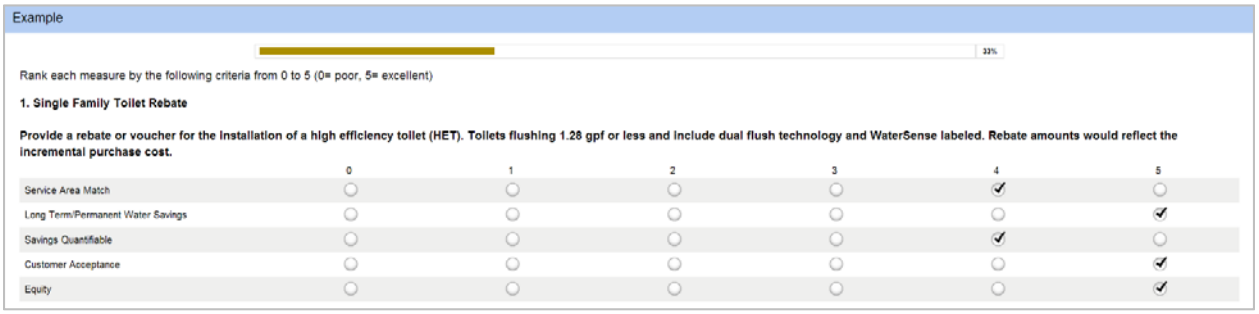


FIGURE 11: EXAMPLE OF MEASURE SCREENING BY METRIC

Staff ranked each metric from 0-5 for each measure using Survey Monkey (Figure 11). The results of the qualitative screening are in Appendix E. Measures with a high score and a high rating for quantifiable savings were included in stage two.

TABLE 8: SELECTED CONSERVATION MEASURES AND SAVINGS

Water Efficiency Activities	Water Savings Estimates in 2040 (AFY)
Foundational Activities	
AMI and Leak Notice*	478
Water Budget Based Billing*	1146
Z Zones	470
Single-Family Tap Fee Credit	2
Water Loss Measure	115
Targeted Technical Assistance and Incentives	0
Single-Family Indoor Water Audits	11
Multi-family Indoor Water Audits	9
Single-Family Leak Repair Assistance	11
Government Building Fixtures*	16
Irrigation Audits	58
Single-family Xeriscape Rebate	4
Large Property Xeriscape Rebate	47
Smart Irrigation Controller Rebate*	96
Rain Sensor Only Rebate*	3
Irrigation Rebate	18
CII High Water Users *	126
Pre-rinse Spray Nozzles*	79
High Efficiency Urinal Rebate*	6
Ultra High Efficiency Toilet Rebates	97
Ordinances and Regulations	0
Rain Sensor Ordinance	559
Water Conserving Landscape Code	1235
Water Management Plan	15
Soil Amendment Requirements	112
Education Activities	0
School (Youth) Education	72

*Proposed future program

Aurora used the DSS model to conduct the second stage of the measure screening. Staff populated the DSS model with Aurora specific data including fixture saturation, growth projections, and water consumption. Savings estimates for each measure were based on historic savings in Aurora and industry standards. Table 8 lists selected measures, by SWSI level framework, which have quantifiable savings. Qualitatively selected programs are located in Section 4.2. Actual annual savings for the year 2040 are shown instead of cumulative savings from 2014-2040. Savings from measures that address the same end use(s) are *not* directly additive. Therefore, the combined savings in Figure 9 should be used instead of Table 8 for estimates of total savings. Figure 9 savings were derived from the DSS model, which uses impact factors to avoid double counting. Asterisks in Table 8 indicate proposed programs. Proposed programs are not official and can be delayed or cancelled due to research, budget, et cetera.

4.2 Demand Management Activities

For each measure in Section 4.2 the savings can be found in Table 8, if applicable. Associated cost and other related information such as number of fixtures per account can be found in Appendix F, if applicable. Avoided cost were not included in the analysis because calculations were ongoing as part of the IWMP at the time of publishing. Therefore, the benefit to cost ratio is not a true representation.

4.2.1 Foundational Activities

Metering

AMI Meters and Leak Notification

Aurora Water has a robust meter maintenance program that follows AWWA recommendations for yearly testing. Currently a new type of smart meter system, known as Advanced Metering Infrastructure (AMI), is under consideration to replace existing Automatic Meter Reading (AMR) meters starting in 2019.

Replacing all the meters in Aurora will take approximately seven years. These new meters will allow customers and Aurora Water staff to view real-time water use opposed to once each month. This functionality will allow staff to notify customers of suspected leaks in a more proactive manner and address water use patterns more effectively. Water loss detection improvements for the system and drought management options are being analyzed as potential additional benefits of AMI meters. Submeter rebates were also included in the qualitative screening, but did not pass the review because of possible low customer acceptance and equity.

Demand Data Collection and Billing Systems

Currently, customer use is read and billed monthly. No updates were considered to the billing or data collection system for the purpose of this report. However, with the implementation of the AMI or Water Budget Based Billing measures these systems will need to update accordingly.

Water Efficiency Oriented Rates and Tap Fees

Water Budget Based Billing

Aurora currently uses an inclined block rate structure, which utilizes a three tiered rate structure for billing residential customers (0-20,000 gallons per month, 20,001-40,000 gallons per month and 40,001 and above per month) and a two tiered water allocation structure to bill all other customers (Appendix D). The current tiers have resulted in a compression of revenue into the first tier, with little revenue being generated by the upper tiers. Since this compression implies that the conservation impact of the tiered rate structure has been fully realized, Aurora is exploring the potential for realigning the tier structure to encourage increased efficiency while maintaining a fair and equitable rate system. Aurora is carefully watching other utilities that have implemented rate structures, such as water budgets, to determine if they provide a system that can be easily understood and accepted by customers. Budget rates have been shown to be effective in reducing landscape irrigation demand[13] and could provide the City a better way of reducing demand in times of drought. Aurora Water is proposing an allocation program to City Council in the summer of 2015. Like all proposed programs, budget based rates could be delayed or cancelled due to a variety of reasons including financial barriers, research, or Council approval.

Z-Zones

Z-zones, or zero-water use zones, were adopted in 2014 and were analyzed as part of this report. Z-zones allow for the installation of a temporary irrigation tap to establish plant material that requires no water at maturity. Z-zones are available at a zero cost per square foot tap fee to developers, but Aurora does charge a small administrative fee for installation of the temporary tap. Z-zones create a large upfront savings for developers to encourage them to install water conservation oriented landscapes in common areas historically composed of turf and watered by irrigation meters. Enforcement of z-zones occurs three years after connection. At that time landscape establishment is determined and either: the tap is pulled, the developers ask for an extension or the developer pays the difference in cost between the normal tap fee and a z-zone tap deposit.

Single-family Tap Fee Credit

A tap fee credit for new single-family residential accounts was also established in 2014. This credit is available to developers if they install 100% xeric landscaping in the front yard of a new build home. If they qualify, developers will receive a $1,000 credit on the property's tap fee.

[13] Mayer et al. 2008. Water Budgets and Rate Structures – Innovative Management Tools. *AWWA*.

System Water Loss Management and Control

Water Loss Measure

Aurora Water has a robust Water Loss program including a Leak Loss and Detection program, an active meter maintenance program, a strong asset management assessment and planning group, an M36 auditing program, and more. Due to Aurora's low water loss rates, additional water loss measures were not looked at as part of this report. The cost and savings of maintaining Aurora's current efforts can be seen in Table 8 and Appendix F.

4.2.2 Targeted Technical Assistance and Incentives

Level 1 Utility/Municipal Facility Water Efficiency

Government Building Fixtures

Aurora Water Conservation will begin auditing city facilities in 2015 to determine the water use and efficiency of existing fixtures. Audit results will be used to assist city departments in retrofitting fixtures such as aerators, showerheads, and toilets.

Level 2 Management of Largest Customer Demands

CII High Water Users (Top CII Users)

In 2014, Aurora begun a trial CII measure, and in 2015 will fully implement the measure to assist CII customers. The purpose of the measure is to target Aurora's top commercial water users (Section 2.2). Staff will analyze water use of these top users, develop efficiency benchmarks and determine ways to help them become more efficient. Customized incentives will be offered to each customer who participates in the measure ranging from toilet and pre-rinse spray nozzle rebates to irrigation audits and rebates.

Level 3 Management of Remaining Customer Demands

Indoor Water Audits (Single-family and Multi-family Water Audits)

Aurora Water customers have the opportunity to receive free audits of indoor water-using fixtures year-round. Conservation staff visit both single-family and multi-family properties to look for evidence of leaks, measure how much water fixtures actually use and identify water use behaviors. After the audit, residents have a true sense of how much water they use in their daily activities, a list of recommended retrofits and behavior alterations as well as free water saving giveaways.

Single-Family Leak Repair Assistance

Customer leaks often occur at properties where owners are least able to pay costs of repair. Aurora offers a credit to customers that discover a leak in their water system on a case-by-case basis. In order to receive a credit, the recipient's account must be in good standing, a repair receipt must be submitted and the request must be made within 90 days of the discovery of the leak. The credit amount is dependent upon the increase in water usage caused by the leak, and does not cover costs associated with repairing the leak.

Irrigation Audit

Throughout the summer, Aurora Water helps customers break free of the "set-it and forget-it" attitude toward their sprinkler systems by offering outdoor audits. Aurora Water staff visit properties to perform a visual inspection of the entire system. Auditors diagnose system inefficiencies and educate customers on proper operation of their systems, how to spot system problems, scheduling techniques and do-it-yourself maintenance. Customers receive a final report on the system's conditions with recommendations on how they can save more water. Aurora targets highly inefficient customers, but any customer can participate in an audit.

Xeriscape Rebate (Single and Large Property Landscape Conversion)

Xeriscape conversion is a practical investment for reducing a property's long-term water consumption, yet upfront costs for these projects are often prohibitive for homeowners. Aurora Water's xeriscape rebate aims to reduce costs that may prevent customers from pursuing water-saving landscape renovations. The measure offers up to $1 per square foot to replace healthy turf with qualified low-water plant material and an additional $0.25 per square foot for approved hardscape features. The maximum rebate for residential properties is $10,000 and the maximum for commercial properties is $25,000.

Smart Irrigation Controller Rebate

Aurora Water is starting a pilot in 2015 to determine the benefit of the installation of smart controllers in increasing irrigation system efficiency. Smart controllers have on-site weather sensors or rely on a signal from a central weather station to modify irrigation times at least weekly. An irrigation audit will be required and Aurora currently anticipates rebating up to 50% of the purchase price of a controller.

Rain Sensor Only Rebate

In the past, Aurora Water offered rain sensor rebates after an irrigation audit. To encourage use of the most water-efficient equipment, Aurora will provide a rebate for the installation of a rain sensor on any existing irrigation system starting in 2015 with or without an audit. The rebate will be up to $15 for a wired sensor and up to $50 for a wireless sensor.

Irrigation Rebate (Efficient Sprinkler Part Replacement)

Aurora created the irrigation rebate program knowing that sprinkler systems are only as efficient as their components. The program incentivizes upgrading system equipment to newer, more water-efficient models. Rebates can apply to automatic sprinkler heads, nozzles, and controllers or drip conversions. Residential properties can be rebated on a line-item basis up to a $1000 lifetime limit while commercial properties are rebated per zone up to 150 zones, or $15,000.

Pre-Rinse Spray Nozzle Rebate

Aurora will begin a rebate program in 2015 to provide the free installation of high efficiency spray nozzles for the rinse and clean operations in restaurants and other commercial kitchens. Replacement will likely result from door to door contact.

Urinal Rebate

With the implementation of the CII program, Aurora will offer and market urinal rebates for commercial customers that replace old urinals with WaterSense 0.25 gpf or less urinals. This program will be tested in 2015 with a pilot, and will most likely be implemented in 2016.

Toilet Rebate

On average, toilets account for approximately 25% of indoor use. Currently, Aurora rebates WaterSense toilets that use 1.28 gallons per flush or less. However, with the implementation of new legislation in 2016[14], which eliminates customers' ability to purchase any toilet over 1.28 gpf, there is no longer a need for the rebate. Aurora has therefore decided to phase out the high efficiency rebate in 2015. In 2016, only Ultra High Efficiency Toilet (UHET), 1.0 gpf or less, rebates will be available. It is anticipated that UHET rebates will also phase out by 2020.

[14] Phase in High-Efficiency Water Fixture Options. 2014. Colorado State § 14-103.

Car Wash Certification Program

This voluntary measure creates a partnership between Aurora Water and local businesses with the goal of communicating best management practices and improving water efficiency at car washes. In addition to conservation operation guidelines, car washes receive an initial audit and regular audits thereafter to maintain their efficiency certification. The certification not only advertises the efficiency of the business, but also allows regular operations to continue during severe drought restrictions. This measure was not analyzed using the DSS model because the vast majority of car washes have obtained a certification.

Low-Income Water Efficiency Program

While rebates help reduce the costs of fixture replacement, Aurora found that the cost of installation remained a barrier for many low-income homeowners. As a response, Aurora formed the Low-Income Water Efficiency Program, a partnership with a local non-profit, Mile High Youth Corps, to help households earning below 60% of Aurora's median income shrink both their water footprint and their water bill through fixture retrofits. Trained Mile High Youth Corps staff replace faucet aerators, showerheads and toilets that have been provided free of charge by Aurora Water. This measure was not included in the DSS model analysis because the majority of savings are capture in the toilet rebate measure.

Greatscapes

In 2014, Aurora begun Greatscapes as a trial measure, and in 2015 will fully implement the measure to assist low income customers. The cost of material and labor prevents many low income homeowners from converting to a xeric landscape. These same homeowners also cannot afford to maintain their existing landscape and so they often receive landscape code violations. The purpose of Greatscapes is to provide five to seven homeowners a year the resources needed for the installation of a low maintenance xeric landscape. Participants are recommended by Neighborhood Services and have to meet an income qualification. Up to $5,000 per homeowner is provided by Aurora Water in the form of a design, materials, and labor. This measure is designed to both help low income homeowners save money and to create examples of well implemented xeriscape throughout the City.

Water Variance Program

This measure aims to ease the strain that shorter watering windows (per Aurora's WMP) may place on large irrigation systems. The measure allows volume allocation customers to run their systems seven days a week provided each irrigation zone is watered no more than the recommended water budget allows. The program requires its 300 participating properties to stay within a yearly water budget in order to continue to receive a variance. By providing more convenient scheduling options for property managers, Aurora was able to incentivize conservation and set budgets for approximately 18% of Aurora's total water demand in 2013. Due to the variance program's starting year, Aurora did not have enough data to include the variance program as part of the DSS model analysis.

Water Smart Reader Rentals

Complimentary to an indoor audit, water smart readers provide real time water meter readings to understand total consumption or track water use over an interval of time. Readers can shed light on how much water individual fixtures use, provide a daily summary of household use and can even detect potential leaks in the home or irrigation system. Aurora rents readers to customers for a deposit, which is refunded when the meter is returned in working condition. Savings associated with water smart readers were captured in the indoor water audit measure for the DSS model analysis.

Artificial Turf Rebate

Artificial turf rebates were analyzed as part of the DSS model. Aurora anticipated providing an incentive to change out portions of sports fields from Kentucky blue grass to artificial turf. In addition to not requiring irrigation, artificial turf reduces costs and environmental impact by requiring less maintenance than real turf. However, the cost to implement a few rebates would double the annual Conservation division budget. The cost to benefit ratio for the utility would be 0.01; the lowest ratio of any measure analyzed. Therefore, artificial turf was not selected to be implemented.

4.2.3 Ordinances and Regulations

Level 1 Existing Service Area

Water Management Plan (Water Wasting Ordinance)

The waste of water in Aurora is prohibited by law. Watering during restricted times, watering for more days than allowed, (unless permitted by a variance), watering excessively to the point of water run-off, failure to repair faulty irrigation systems and application of water on impervious surfaces are all defined as a waste of water and are subject to penalty. This ordinance is enforced by Aurora Conservation staff year-round.

Landscape Permit (Soil Amendment/Irrigation Permit includes Rain Sensors)

All new and replacement irrigation systems and lawns greater than 250 square feet must apply for a permit. Aurora inspectors ensure compliance by inspecting irrigation system equipment, checking for rain sensors, and verifying correct amendments in sod installation areas to ensure the city's efficiency standards are being met. Aurora's irrigation standards ensure the most efficient equipment is being installed while the soil preparation standards increase the water retention and nutrient content of soil, which improves the drought tolerance of turf grasses.

Irrigation Plans Review

City code embraces the idea that outdoor conservation begins with proper landscape construction. Aurora Water's Conservation department plays an important role ensuring landscape development and renovations incorporate water conscious installation practices. Developers must submit new irrigation system plans for multi-family and commercial properties so that staff can review conformance with ordinance requirements including materials, hydraulics, layout and efficiency so water wasting is not built into system design. The review process helps contractors maintain quality work and helps protect property owners against innately inefficient irrigation systems.

Level 2 New Construction Regulations

Water Conserving Landscape Code

After the drought of 2002, Aurora implemented several landscape code changes that promote water conservation. First, turf restrictions were put in place based on lot size (Table 9). Second, a xeric option was added to code. In 2009, three additional changes were made to the Aurora landscape code to further incentivize the use of xeric/low-water plant material.

TABLE 9: TURF RESTRICTIONS BY LOT SIZE

Lot Size	Maximum Turf
Small	50%
Standard	40%
Large	40%
Estate	40%

Specifically, the square foot values for perennials and shrubs in this class were increased to facilitate reaching the 50% long lived plant material requirement with less plant material. City Council also declared that private covenants (such as those found in a covenant community or homeowners associations), which are contrary to City policy, are invalid. Finally, there is no longer a bluegrass requirement for tree lawns, park strips or boulevards.

Level 3 Point of Sales Ordinances on Existing Building Stock

Aurora qualitatively evaluated several measures, such as toilet retrofits requirements on any resale or water account name change, aimed at point of sale ordinances and regulations (Appendix E). However, due to expected low customer acceptance and equity they did not pass the screening.

4.2.4 Education Activities

Educational activities were not included in the DSS model analysis. Instead, these measures were screened qualitatively (Appendix E).

Level 1 One-Way Education Activities

There are many activities such as mailers, social media updates, and monthly newsletters that fall under this category and will be collected annually for state reporting. However, because they also are part of another measure they are not included in Section 4.2.4 or the implementation plan.

Xeriscape Demonstration Garden

The Aurora Xeriscape Demonstration Garden spans ten acres of the Aurora Municipal Center campus. Built in 2002, it is now one of the largest xeriscape gardens in Colorado and is the premier example of water-wise landscaping in Aurora. The garden displays a range of xeriscape techniques and plant material palettes. Plants are labeled with their common and scientific names and large signs throughout the garden explain Aurora's water supply and the seven principles of xeriscape.

Conservation Calculator

Aurora's online conservation calculator lets homeowners perform their own evaluation of water use inside and outside their homes. The user-friendly tool prompts customers to provide information on the type of water fixtures in their home, water use behavior patterns and irrigation methods. Inclusive in their self-assessment, customers can explore potential water saving options, costs included, through a range of fixture, behavior and landscape changes. Once completed, homeowners obtain estimates of options with the quickest return on their investment. Aurora plans on revamping the calculator in 2015. After the revamp, Aurora intends to use the calculator as a way to qualify customers for best-fit rebates.

Level 2 One-Way Education with Feedback

Youth Education Classes

Aurora Water Conservation believes that educating youth is an investment in both the present and future of the City. Recognized throughout Colorado as a leader in youth education, Aurora Water strives to provide consistent, creative and impactful outreach programs for youth in Aurora. An education specialist coordinates a range of presentations, field trips, educator training and events that spark appreciation of Aurora's most precious resource. Entertaining presentations, water system models, games and hands-on activities are used to education public and private schools, home-school groups, youth organizations (such as boy and girl scouts), summer camp programs and environmental clubs. School presentations bring staff to Aurora classrooms with interactive and age-appropriate information on everything water. In addition to a broad menu of subjects, Aurora has grade-specific choices for elementary, middle and high school classes that meet Colorado's State Curriculum Standards. The youth education program is the only education measure Aurora attempted to quantify using the DSS model.

Excellence in Xeriscape Award

Aurora created the Xeriscape Award to help promote low water landscaping by recognizing an Aurora Water customer with a completed xeriscape project that exemplifies the seven principles of xeriscape.

After the pilot year, Aurora decided to increase program marketing for greater participation and expand the award categories to separate residential and commercial property awards.

Forests to Faucets

In partnership with Aurora Parks, Recreation and Open Space, Aurora Water's Forests to Faucets Continuing Education Workshop provides Aurora teachers with free, in-depth education on water and 1.5 semester hours of graduate/re-certification credit. Teachers explore topics such as where Aurora's water comes from, how Aurora's water is treated and Aurora's place within its watersheds, all while emphasizing the importance of conservation. During the workshop, Aurora Water takes teachers on a journey through Aurora's water system, traveling upstream from Binney Treatment Facility to Buffalo Peaks Ranch outside Fairplay. At the end of the three-day program, teachers walk away with interactive curriculum guides, materials and ideas on how to make these concepts come alive in the classroom.

Adult Education

Adult education provides an opportunity to instill the value and practical knowledge of water conservation into the daily lives of Aurora's citizens. Aurora provides free classes to customers year round, in classroom settings and in the Aurora Xeriscape Demonstration Garden. In-person classes utilize both presentations and hands-on demonstrations to cover a range of topics including xeriscape, irrigation and vegetable gardening. All classes are also available online, along with several presentations on advanced topics including rainwater diversion and native plant/habitat gardening.

1-on-1 Design Consultations

Preparation is the key to ensuring the success of a xeriscape project and making the installation process as simple and cost effective as possible for homeowners. Aurora offers customers free xeriscape design consultations with landscape designers. At the end of the two-hour consultation (longer for commercial and multi-family accounts) customers receive a landscape design and a plant list that uses significantly less water than Kentucky bluegrass lawn while providing year-round appeal. Consultations are offered independent of the xeriscape rebate program, though many participants pursue a rebate to help recover landscaping costs.

H2O Outdoors

Aurora Water sponsors ten Aurora high school students each year at "H2O Outdoors" at the Keystone Science School. During this three-day program, students learn about their watershed while hiking the Continental Divide, testing river water quality and debating water issues in a mock town hall meeting. This program prepares future leaders to address the increasingly complex issues that affect Aurora's water resources.

Community Gardens

The Community Gardens Program was initiated by the Aurora Citizens' Water Advisory Committee in 2010. Aurora Conservation staff serve as the primary contact for potential and existing community garden leaders and collaborate with local partners to aid in the development of community gardens throughout Aurora. Staff also provide technical assistance in the planning of gardens and assist in procuring supplies for new gardens. In 2013, Aurora Water worked with local leaders to initiate the Aurora Community Garden Network. The group's mission is to provide opportunities for community garden members to exchange ideas, increase public awareness of community gardens in Aurora and advocate for best management practices.

Water-Smart Landscape Contractor Training

This annual training opportunity teaches landscape contractors doing business in Aurora about city code requirements, water conservation best practices and Aurora Water Conservation programs. Contractors who pass an examination are included on a list of Water-Smart Landscape Contractors available to the public on the Aurora Water website.

H2O Tracker Smartphone App

Aurora residents now have the opportunity to conserve with the help of their phone. Aurora Water maintains an innovative, engaging smartphone app that helps homeowners track their water use and learn how to cut their water waste. By inputting their zip code, customers can see location- and weather-specific watering times for their sprinkler systems each week. Customers can also accumulate points for prizes as they answer trivia and fill out a profile that sheds light on daily water use. The app has fostered a higher level of communication by allowing Aurora Water to relay water saving suggestions and drought conditions while in turn empowering customers to report water wasting around the city anonymously.

Youth Water Festival

Aurora's Youth Water Festival has provided a fun-filled day of environmental education to fifth-grade students for over two decades. The Festival features over 40 presentations and exhibits that cover a wide variety of water-related topics. Over 150 volunteers and experts in the water field provide Aurora's fifth-graders with a memorable hands-on experience. Students walk away with a greater understanding of water in their daily lives as well as concrete actions that they can take to conserve and protect Aurora's water. The Festival is a centerpiece of broader classroom learning. Aurora provide teachers with water curriculum for use before and after the event. Classes prepare for the festival with a pre-test and find answers in a scavenger hunt at the Festival.

Level 3 Two-Way Education

Xeriscape Volunteer Program

Volunteers are essential to the Aurora Xeriscape Demonstration Garden. Hundreds of volunteer hours are given each year to help maintain the existing landscape, develop new garden beds, and educate the public. The Aurora Xeriscape Volunteer program provides individuals an experience in civic engagement and hands-on environmental stewardship. Volunteers learn valuable gardening skills and each is given the opportunity to educate visitors about the benefits of xeriscape.

Citizen Water Advisory Committee (CWAC)

Aurora developed the CWAC in 2003 to provide our customer-base a method to weigh-in on long-term and short-term projects, budgets and communications. CWAC provides advice on all phases of budget, departmental work plans, operational needs, strategic planning, long-range capital improvements, and financial planning for Aurora Water. This nine-person committee is appointed by city council and is made up of eight Aurora residents and one commercial customer. CWAC is not included in the implementation plan because the goal of this measure is not water savings.

5.0 Implementation and Monitoring Plan

Aurora Water's implementation plan for the selected water efficiency measures (Section 4) can be seen in Appendix G. Many of these measures are already in place, though some are proposed to come online in the next few years. All proposed new measures will undergo a vetting process to determine if they are still feasible for the time outlined in the plan. Aurora has also established a monitoring plan in order to measure the impact of the implemented measures as they relate to the goals outlined in Section 3.2.

All measures will be monitored by analyzing per capita water use, per unit water use, and weather data every year when the data is submitted for House Bill 10-1051 purposes (HB1051)[15]. Additionally, HB1051 water loss data will be analyzed to determine the impact of Aurora's Water Loss and AMI and Leak Notification measures. When Aurora Water is preparing the Annual Water Conservation Report measure descriptions, recorded parameters, annual cost, lessons learned, water savings estimates, relevant public feedback and significant changes will all be recorded and analyzed for each conservation measure listed in the implementation plan. The following measures will not include water savings estimates because it is not possible to quantify savings at this time.

- Water Management Plan
- Forest to Faucets
- Xeriscape Demonstration Garden
- H2O Outdoors
- Water-Smart Landscape Contractor Training
- H2O Tracker Smartphone App
- Youth Water Festival
- Community Gardens Program
- Youth Water Festival
- Excellence in Xeriscape Award

All measures will be analyzed by the Office of Aurora Water Conservation but the following measures will have other groups within Aurora assisting.

- AMI and Leak Notice (Transmission and Distribution [T&D], Billing, Public Relations)
- Water Budget Based Billing (Billing, Public Relations)
- Z-Zones (Engineering, Planning Department)
- Single Tap Fee Credit (Engineering, Public Works Department)
- Water Loss Measure (T&D, Engineering)
- Single-family Leak Repair Assistance (Billing)

The supervisor of Conservation will use the annual analysis to modify programs as needed. Every five years conservation savings will be reanalyzed as part of the IWMP process. Any changes to infrastructure or water resources planning will take place at this time.

[15] Reporting of Water Use and Conservation Data. 2010. C.R.S. 37-60-125

6.0 Adoption of New Policy, Public Review, and Formal Approval

6.1 Public Review Process

Aurora surveyed over 1,400 customers that have interacted with the Office of Water Conservation since 2002. The results of the September 2014 survey are included in Appendix H. The survey asked customers a variety of questions relating to future rebates and adult education class offerings. Prior to the CWCB submittal, Aurora Water will post the 2015 Municipal Water Efficiency Plan on the conservation website for members of CWAC, the Conservation email list, and the public to comment on. The report was open for public commentary for a period of 60 days. All public feedback, with responses by Aurora Water, is included in Appendix I.

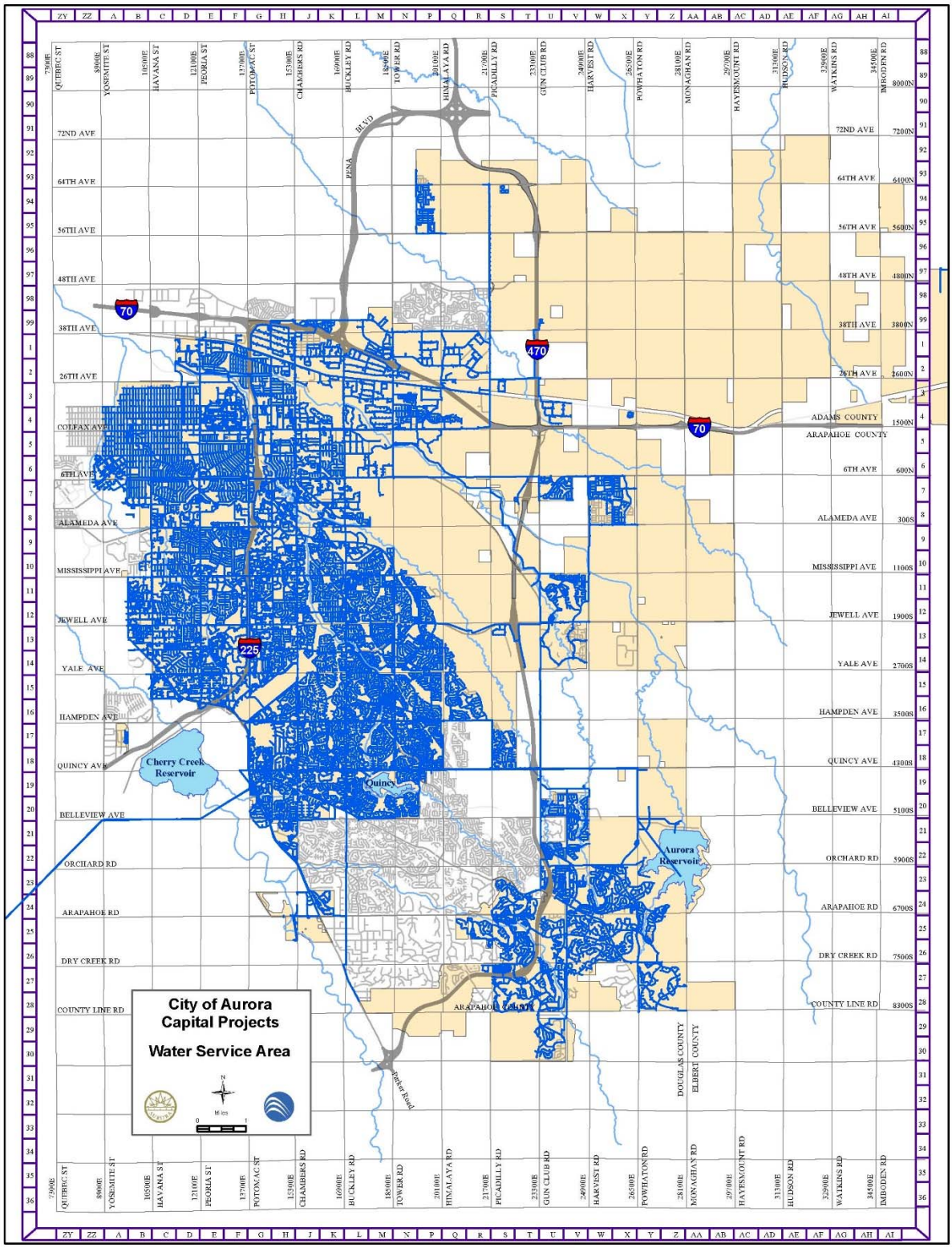
6.2 Local Adoption and State Approval Process

Following the public comment period a letter of adoption by the Director of Aurora Water was included as Appendix J.

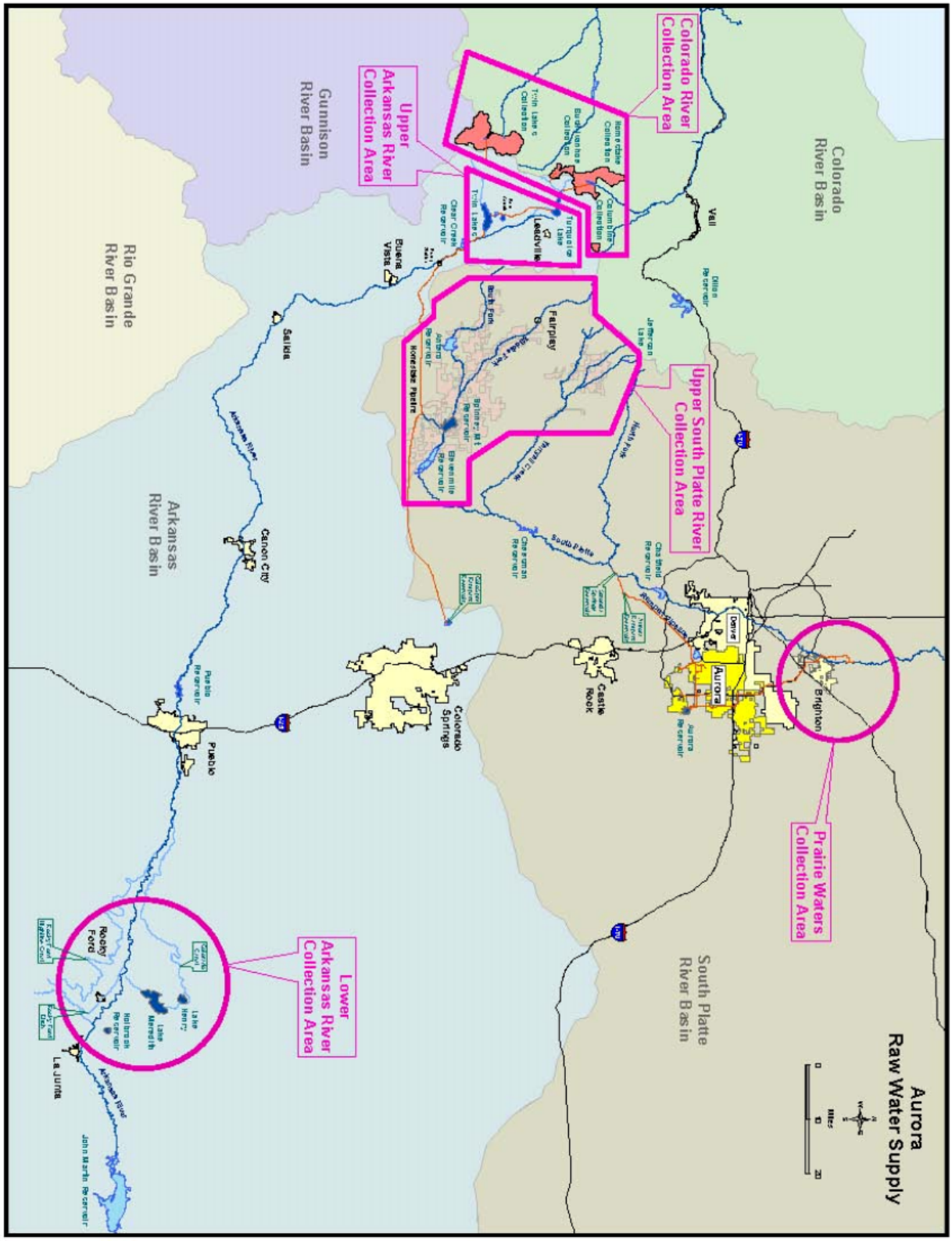
6.3 Periodic Review and Update

Aurora will submit a formal water efficiency plan update by 2022. A review and revision of each section will be completed as necessary.

Appendix A: Aurora Water Service Area



Appendix B: Aurora Raw Water Supply System



Appendix C: DSS Model Background

The Demand Side Management Least Cost Planning Decision Support System or DSS Model is an end-use model that breaks down total water production to specific water end-uses such as toilets, faucets, or irrigation. The end-use is a "bottom-up" approach that allows specific criteria to be considered when estimating future demands, such as the effects of natural fixture replacement, plumbing codes, and conservation efforts. The DSS Model can prepare long-range demand projections or use a utility prepared water demand forecast.

Schematic of DSS Model as applied to an urban water agency or regional area for water conservation

To forecast the impact of conservation on urban water demands using the DSS Model, customer demand data (in aggregate at the wholesale supplier level or billing data at the retail water provider level) is obtained from the water agency being modeled. The demand data is reconciled with available demographic data to characterize the water usage for each customer category in terms of number of users per account and per capita water use. The data is further analyzed to approximate the split of indoor and outdoor water usage in each customer category. The indoor/outdoor water usage is further separated into typical end uses for each customer category. Published data on average per-capita indoor water use and average per-capita end use are combined with the number of water users to calibrate the volume of water allocated to specific end uses in each customer category. In other words, the DSS Model checks that social norms from end studies on water use behavior (e.g., for flushes per person per day) are not exceeded.

The DSS Model evaluates conservation measures using cost benefit analysis with the present value of the cost of water saved ($/AF) and benefit-to-cost ratio as economic indicators. The analysis is performed from various perspectives including the utility and community (utility plus customer). Benefits are based on savings in water and wastewater facility operations and maintenance (O&M) and savings from deferring or downsizing future capital facilities, such as water treatment plant expansions or new source development (not included in this report). The above figure illustrates the six-step process for forecasting conservation water savings, including the impacts of fixture replacement due to plumbing codes and standards already in place.

The DSS Model has been used for practical applications of conservation planning in over 230 service areas representing 20 million people including extensive efforts nationally in California, Colorado, Hawaii, Utah, Georgia, Florida, North Carolina, Oregon, Ohio, and internationally in Australia, New Zealand and Canada.

Appendix D: 2015 Aurora Water Rates

AURORA WATER

Water, Storm Drain and Sewer

RATES EFFECTIVE JANUARY 1, 2015

(Water is billed in units of 1000 gallons)

RESIDENTIAL & MULTI-FAMILY (less than five units)		
	WATER	
BASE	See below	
TIER I	$5.27	0-20,000 gal.
TIER II	$6.00	20,001-40,000 gal.
TIER III	$7.50	40,001 gal. and above
	SEWER	
BASE	See below	
USAGE*	$3.36	
	STORM DRAIN	
BASE	$8.16	

COMMERCIAL		
	WATER	
BASE	See Below	
TIER I	$5.67	up to 100% alloc
TIER II	$6.24	greater than 100%
	SEWER	
BASE	See Below	
USAGE*	$3.36	
	STORM DRAIN	
BASE	$8.16	
	$6.42	*each additional unit*

MULTIFAMILY (five or more units)		
	WATER	
BASE	See Below	
TIER I	$5.60	up to 100% alloc.
TIER II	$6.16	greater than 100%
	SEWER	
BASE	See Below	
USAGE*	$3.36	
	STORM DRAIN	
BASE	$8.16	
	$6.42	*each additional unit*

IRRIGATION		
BASE	See Below	
TIER I	$6.48	up to 100% alloc
TIER II	$7.13	greater than 100%

HYDRANT			
BASE 3/4	$11.05	USAGE	$8.97
BASE 3	$70.09		per 1000 gal.

BASE CHARGES

Size (inches)	R/M/C	IRR	SEWER
5/8 & 3/4	$12.06	$10.46	$3.66
1 & 1 1/4	$17.77	$13.77	$8.69
1 1/2	$27.31	$19.28	$18.27
2	$38.74	$25.91	$29.21

Size (inches)	R/M/C	IRR	SEWER
3	$69.23	$43.57	$63.98
4	$103.53	$63.45	$182.84
6	$198.81	$118.64	$365.71
8	$465.60	$273.18	$365.71

R/M/C = RESIDENTIAL/MULTIFAMILY/COMMERCIAL

* Sewer usage is determined by Winter Quarterly Average (average December, January and February water use) *Billed per thousand gallons.*

NOTE:

2015 Sewer Rates reflects a 4% increase

Appendix E: Qualitative Screening Results

Aurora Water engineering, water resources, management and conservation staff evaluated each measure below based on qualitative criteria, scored on a scale of 1 to 5, (where 1 represented strong disapproval of implementing in Aurora Water's service area; and 5 strong approval). The measure description is general and not tailored to the Aurora service area so some measures, such as rainwater collection, are listed even if they cannot be implemented. Each screener was allowed one vote. The votes were then summarized with the measures with the highest scores being most attractive. Total scores are shown in the following table. Measures that passed the screening were included in the DSS Model analysis (Appendix F) unless otherwise noted in Section 4.

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Conduct Annual System Water Use Audit	Maintain a thorough annual accounting of water production, sales by customer class and quantity of water produced but not sold (non-revenue water). In conjunction with system accounting, include audits that identify and quantify known legitimate uses of non-revenue water in order to determine remaining unaccounted for water losses. Goal would be to lower the Infrastructure Leakage Index (ILI) and non-revenue water every year by a pre-determined amount based on cost-effectiveness. These programs typically pay for themselves based on savings in operational costs (and saved rate revenue can be directed more to system repairs/replacement and other costs).	4.3	4.3	4.5	4.1	4	**21.2**
Apparent Loss Reduction - Billing System	Continuously analyze billing data for system errors and under-registering meters. Identify and quickly notify customers of apparent leaks.	4.3	3.9	4.4	4.2	4.2	**21**
Apparent Loss Reduction - Meter Testing	Address meter testing and repair/replacement to insure more accurate meter reads and revenue collection. Actions could include meter calibration and accelerated meter replacement.	4.3	3.9	4	3.9	4.3	**20.4**
Real Water Loss Reduction	Measure covers efforts to find and repair leaks in the distribution system to reduce real water loss. Actions could include installation of data loggers and proactive leak detection. Leak repairs would be handled by existing crews at no extra cost. Specific goals and methods to be developed by Utility.	4.1	4.1	3.9	4.1	4.2	**20.4**
Distribution System Pressure Regulation	Install additional pressure regulators in portions of distribution system to maintain pressure within limits so accounts do not receive excessive pressure. There is a high correlation between high water usage and high pressure, due to higher leakage, automation of sprinklers and ease of using excessive water.	4.1	3.3	2.9	3.3	3.8	**17.4**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Install AMI	Retrofit system with AMI meters and associated network capable of providing continuous consumption data to Utility offices. Improved identification of system and customer leaks is major conservation benefit. Some of costs of these systems are offset by operational efficiency and reduced staffing, as regular meter reading and those for opening and closing accounts are accomplished without need for physical or drive-by meter reading. Also enables enhanced billing options and ability to monitor unauthorized usage (such as use/tampering with closed accounts or irrigation if time of day or days per week are regulated). Customer service is improved as staff can quickly access continuous usage records to address customer inquiries. Optional features include online customer access to their usage, which has been shown to improve accountability and reduce water use. A ten-year change-out would be a reasonable objective.	4.4	3.7	3.9	3.9	4.4	**20.3**
Install AMI New Development	Require that new customers install such AMI meters as described above and possibly purchase means of viewing daily consumption inside their home/business either through the Internet (if available) or separate device. The AMI system would, on demand, indicate to the customer and Utility where and how their water is used, facilitating water use reduction and prompt leak identification. This would require Utility to install an AMI system.	4.6	3.9	3.8	3.8	3.7	**19.8**
Rate Structure Evaluation	Rates must meet Utility costs, but some features can improve customer accountability by better imposing cost impacts for high water usage. Conservation oriented rate structures in some states (i.e., California) generally collect less than 30% of water revenue through base charges. Tiered rate structures are the most popular form of conservation rates, and can be very effective provided there are sufficient tiers (3 to 4 is recommended), and price differences between tiers is sufficient and tiers are placed at usage levels that appropriately reflect low, medium and high usage levels for the Utility. Would also require a rate study.	4.2	4.1	4	2.3	4.4	**19**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Modification to or Implementation of Tiered Rate Conservation Pricing	Consider revising Utility's tiered rates or seasonal pricing for other customer classes. Some utilities utilize percentages of average winter usage as the basis for individualized summer tiers. Multi-Family Residential tiers could be based on number of housing units served by meters. Would require a rate study and advanced billing system capabilities.	4.1	3.9	3.6	2.2	3.7	**17.5**
Establish Separate Pricing Structure for Irrigation Accounts	Though some landscape irrigation is expected, water used in irrigation accounts is often excessive. Including these accounts in the same category as the primary account may also result in them being charged differently for one customer class than another. Having price incentives for efficient irrigation usage is a key conservation objective. Would require a rate study.	4.5	4.1	4.2	2.8	3.6	**19.2**
Water Budget Based Billing	Develop individualized monthly water budgets for all or selected category of customers. Water budgets are linked to a rate schedule where rates per unit of water increase when a customer goes above their budget, or decreases if they are below their budget. Budgets typically are based on such factors as the size of the irrigated area and often vary seasonally to reflect weather during the billing period. These rates have been shown to be effective in reducing landscape irrigation demand (AWWARF Reports). Could combine this measure with other water rate measures. Would require rate study and capable billing software.	4.5	4.3	4.5	3.1	4.1	**20.5**
Mobile Home Park Submetering	Require or provide a partial cost rebate to meter all sites within a mobile home park that is currently master metered.	3.1	3.3	4	2.3	2.4	**15.1**
MF Submeter Incentive	Provide a rebate (per unit) to assist MF building owners install submeters on each new individual apartment unit.	4.2	3.3	3.9	3.1	2.9	**17.4**
Require Multi-Family Submetering for New Developments	Require the metering of individual units in new multi-family, condos, townhouses, and mobile-home parks.	4.5	4	3.8	3.6	3.5	**19.4**
Single-family Water Surveys	Indoor water surveys for existing single-family residential customers. Target those with high water use and provide a customized report to owner. May include give-away of efficient showerheads, aerators, toilet devices.	4.4	3.6	3.8	4.1	3.4	**19.3**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Multi-Family Water Surveys	Indoor water surveys for existing multi-family residential customers (5 units or more). Target those with high water use and provided a customized report to owner. Usually combined with outdoor surveys (see Irrigation Measures) and sometimes with single-family surveys.	4.3	2.9	3.4	3.4	3.2	**17.2**
Real Customer Water Loss Reduction - Leak Repair Assistance	Customer leaks often occur at properties where owners are least able to pay costs of repair. These programs may require that customer leaks be repaired, but either subsidize part of the repair and/or pay the cost with revolving funds that are paid back with water bills over time. May also include option to replace inefficient plumbing fixtures at low-income residences.	4	3.3	3.9	3.8	3.2	**18.2**
High Efficiency Faucet / Aerator / Showerhead Giveaway	Utility would buy showerheads and faucets, aerators in bulk and give them away at Utility office, community events or audits.	4	3.3	2.3	4.4	3.7	**17.7**
High Efficiency Faucet / Aerator / Showerhead Giveaway	Utility would buy showerheads and faucets, aerators in bulk and give them away at Utility office, community events or audits.	3.3	2.7	2.5	3.7	2.5	**14.7**
High Efficiency Toilet (HET) Rebates	Provide a rebate or voucher for the installation of a high efficiency toilet (HET). Toilets flushing 1.28 gpf or less and include dual flush technology and WaterSense labeled. Rebate amounts would reflect the incremental purchase cost.	4.1	4.3	3.9	4.1	3.9	**20.3**
High Efficiency Toilet (HET) Rebates	Provide a rebate or voucher for the installation of a high efficiency toilet (HET). Toilets flushing 1.28 gpf or less and include dual flush technology and WaterSense labeled. Rebate amounts would reflect the incremental purchase cost.	3.8	4.1	3.6	3.8	3.2	**18.5**
High Efficiency Urinal Rebates	Provide a rebate or voucher for the installation of a high efficiency urinals. WaterSense standard is .5 gpf or less, though models flushing as low as 0.125 gpf (1 pint) are available and function well, so could be specified. Waterless urinals are also available. Rebate amounts would reflect the incremental purchase cost.	3.8	4	3.6	3.9	3.3	**18.6**
High Efficiency Toilet and / or Urinal Bulk Purchase Program	Utility would buy HETs or urinals in bulk and give them away or sell them at a discounted price for customers who want to replace a 3.5 gallon/flush toilet or >1 gal/flush urinal.	3.2	3.4	2.9	3	3.2	**15.7**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
High Efficiency Toilet and / or Urinal Exchange Day	Utility would buy toilets and urinals in bulk and give them away or sell them at a discounted price for customers who want to replace 3.5 gallons/flush toilet or more than one gallon/flush urinal.	3.1	3.3	2.9	2.8	3	**15.1**
Plumber Initiated High Efficiency Toilet and / or Urinal Retrofit Program	Utility would subsidize installation cost of a new HET/ HEU purchased in bulk by the Utility. Licensed plumbers, pre-qualified by the Utility would solicit customers directly. Customers would get new HET or HEU installed at a discounted price. Pattern after Sonoma County, California program that replaced over 5,000 toilets in several communities in about six months.	3.5	3.8	3.4	3.3	3.5	**17.5**
Install High Efficiency Fixtures in Government Buildings	Install high efficiency faucets, toilets, urinals and showerheads in City or Utility facilities. Could also offer incentives for similar installations in other government buildings (such as utility pays for all or part of fixture cost, and building owner providing installation).	3.7	3.9	3.7	3.8	2.4	**17.5**
Install High Efficiency Toilets, Urinals, and Showerheads in Commercial Buildings	Consider direct install program, rebates or grants for installation of high efficiency fixtures in all or selected commercial or institutional buildings. Replacements would include high efficiency toilets, showerhead, and waterless or high efficiency urinals.	3.4	3.9	3.8	3.3	2.9	**17.3**
Toilet Retrofit on Resale or Name Change on Water Account	Work with the real estate industry to require a certificate of compliance be submitted to the Utility that verifies that a plumber has inspected the property and efficient fixtures were either already there or were installed before close of escrow. Pattern after Los Angeles, CA or San Diego, CA programs.	3.3	3.6	3	2.2	2.7	**14.8**
Require <0.25 gal/flush urinals in new development	Require that new building be fitted with 0.25 gpf (or one pint) urinals rather than the current standard of 0.5 gal/flush models.	3.6	3.9	3.4	2.7	2.4	**16**
Require Fixture Replacement by a Deadline	Utility would pass an ordinance that requires homeowners and businesses to bring fixtures up to efficient standard by a fixed date at their own expense.	3.3	3.9	3.6	0.8	2.3	**13.9**
Garbage Disposal	Encourage 1% of single-family homeowners per year to remove garbage disposals. Could provide a rebate.	2.9	2.8	2.2	1.4	2.3	**11.6**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Require Hot Water on Demand / Structured Plumbing in New Developments	Work with developers to equip new homes or buildings with efficient hot water on demand systems such as structured plumbing systems. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater or to move the water heater into the center of the house and/or reduce hot water waiting times by having a an on-demand pump on a recirculation line.	3.7	3.1	2.9	2.1	2.4	**14.2**
Provide a Rebate for Hot Water on Demand Pump Systems	Provide a rebate to equip homes with efficient hot water on demand systems. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to reduce hot water waiting times by having a an on-demand pump on a recirculation line. Can be installed on kitchen sink or master bath, wherever hot water waiting times are more than 1/2 minute. Requires an electrical outlet under the sink, which is not common on older home bathrooms but is on kitchen sinks.	3.7	3.1	3.2	3	2.5	**15.5**
Residential Washer Rebate	Provide a rebate for efficient washing machines to single-family homes and apartment complexes that have common laundry rooms. It is assumed that the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star) and only offer the best available technology. This program might rebate washers with a water factor of 6.0 or less, or modify to lower the eligibility to 4.0 WF or less.	3.6	3.4	3.3	3.8	2.6	**16.7**
High Efficiency Washer Rebate	Provide a ($400) rebate for the installation of a high efficiency commercial washer (HEW). Rebate amounts would reflect the incremental purchase cost. Program will be shorter lived as it is intended to be a market transformation measure and eventually would be stopped as efficient units reach saturation.	3.1	3.2	3.5	3.1	2.2	**15.1**
Require High Efficiency Clothes Washers in New Development	Require developers to install an efficient clothes washer (meeting certain water efficiency standards, such as gallons/load), Building Department would be requested to ensure that an efficient washer was installed before new home or building occupancy. Verify that the Utility can enforce conditions of water service that may include efficiency standards for washing machines.	3	3	2.8	1.6	1.9	**12.3**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Efficient Dishwasher Rebates	Provide a rebate to encourage homeowner to purchase an efficient dishwasher (meeting certain water efficiency standards, such as a limit on the gallons/load) when replacing an existing dishwasher.	3.6	3.4	3.2	3.2	2.5	**15.9**
Require Efficient Dishwashers in New Development	Require developers to install an efficient dishwasher (meeting certain water efficiency standards, such as gallons/load).	3.6	3.4	3	2.4	2.2	**14.6**
Outdoor Water Surveys	Outdoor water surveys offered for existing customers. Normally those with high water use are targeted and provided a customized report on how to save water. Can be combined with indoor surveys or focused on certain customer classes. All multi-family residential, public and private irrigators of landscapes would be eligible for free landscape water surveys upon request.	4.6	3.8	3.9	3.6	3.7	**19.6**
Financial Incentives for Irrigation and Landscape Upgrades	For SF, MF, CII, and IRR customers with landscape, create a Smart Landscape Rebate Program to provide rebates for substantive landscape retrofits or installation of water efficient upgrades; Rebates contribute towards the purchase and installation of water-wise plants, compost, mulch and selected types of irrigation equipment upgrades. May be wise to combine with ordinances for new development to assure that impact of features being rebated in retrofits isn't being negated by landscapes being installed with new construction.	4.4	3.9	3.8	3.9	3.7	**19.7**
Landscape Conversion or Turf Removal	Provide a per square foot incentive to remove turf and replace with low water use plants or hardscape. Some programs include a rebate of $1 per square foot removed, capped at an upper limit of $10,000 for single-family residence.	4.6	4.1	4.2	3.5	3.5	**19.9**
Landscape Conversion or Turf Removal	Provide a per square foot incentive for to remove turf and replace with low water use plants or hardscape. Some programs include a rebate of $1 per square foot removed, capped at an upper limit of $25,000 for multi-family or commercial residence.	4.5	4	3.8	3.5	3.3	**19.1**
Artificial Turf Sports Fields	Provide a rebate for customers to install artificial grass on sports fields.	4.3	4.2	4.1	2.6	2.7	**17.9**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Smart Irrigation Controller Rebates	Provide a per station rebate up to a cost-share 50% up to $300 for the purchase of a SMART irrigation controller. These Smart controllers have on-site weather sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly. Requires local irrigation contractors who are competent with these products, so may require sponsoring a training program in association with this measure.	4.4	4.1	3.9	3.7	3.3	**19.4**
Require Weather Adjusting Smart Irrigation Controllers and / or Rain Sensors	Require developers for all properties of greater than four residential units and all commercial development to install the latest state of the art SMART irrigation controllers. Some utilities offer rebates for rain sensors For example see Cal Green building code that requires this on all new buildings with an irrigation system. May require landscaper training.	4.5	3.8	3.5	2.7	3.2	**17.7**
Rebate or Free Rain Sensors	Provide a rebate rain sensor shut-off device for existing irrigation controllers. These cancel scheduled sprinkling when sufficient rain has been received. This measure is most effective in areas with intermittent rain in peak watering seasons.	4.2	3.4	3	3.4	3.5	**17.5**
Require Rain Sensors	Require installation of rain sensor shut-off devices when installing new irrigation system. These cancel scheduled sprinkling when sufficient rain has been received. This measure is most effective in areas with intermittent rain in peak watering seasons.	4.1	3.4	3	2.4	3.4	**16.3**
Rotating Sprinkler Nozzle Rebates	Provide rebates to replace inefficient automatic sprinkler heads with efficient automatic sprinkler heads.	4.2	3.2	3	3.5	3.4	**17.3**
Water Conserving Landscape and Irrigation Codes	Develop and enforce Water Efficient Landscape Design Standards. Standards specify that development projects subject to design review be landscaped according to Xeriscape principals, with appropriate turf ratios, plant selection, efficient irrigation systems and smart irrigation controllers.	4.4	4.2	3.3	2.7	3.2	**17.8**
Prohibit HOA or CC&R conditions that mandate planting turf in New Developments	New developments would remove mandate of water intensive landscaping in front yard including cool season grasses.	4.4	4.1	3.6	2.3	2.7	**17.1**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Require Irrigation Designers / Installers be Certified (possibly by IA)	Require that design of irrigation systems be done by trained/certified contractors. Certification might be through the Irrigation Association (IA) and/or specialized training provided by utility. Model after Cary, North Carolina's program.	4	2.6	1.8	2.1	2.5	**13**
Irrigation Scheduling Program	Specify specific irrigation schedules, including which days and times watering is allowed. Would help with load balancing system demands with planning for water areas can water on what days. Consider water waste enforcement approach.	4.1	2.4	2.4	2.2	3.4	**14.5**
Provide Rain Barrel Incentive	Provide incentive for installation of rain barrels. This could involve rebates or bulk purchase and giveaways of barrels plus workshops on proper installation and use of captured rainwater for landscape irrigation. Pattern after Honolulu Board of Water Supply program.	0	0	0	0	0	**0**
Provide Incentive for Large Rainwater Catchment Systems	Provide incentive for installation of large rainwater catchment systems. This could involve rebates, grants and other cost share methods. Might require simultaneous installation of water efficient landscaping to assure that amount of water collected is capable of lasting into the peak irrigation season.	0	0	0	0	0	**0**
Gray water Retrofit SF	Provide a rebate to assist a certain percentage of single-family homeowners per year to install gray water systems.	3.3	3.5	3.1	2.3	2.3	**14.5**
Require Plumbing for Gray Water In New SF Development	Provide a rebate or require builders of single-family homes to provide plumbing for and/or install a gray water system in new homes.	3.8	3.6	3	2.2	2.5	**15.1**
Rebate for Gray Water Systems In New CII Development	Provide a rebate for gray water systems in new CII development.	3.7	3.6	3.2	2.5	2.6	**15.6**
Require or Rebate Swimming Pool Covers	Provide a rebate through pool equipment supply stores for purchase of a swimming pool cover.	2.1	2.1	2.2	2.2	1.5	**10.1**
Prohibit Water Waste and Practices	Adopt or modify ordinance that prohibits the waste of water defined as watering impervious surfaces and failure to repair leaks in a timely manner.	4	3.5	2.4	2.6	3.6	**16.1**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
New Zero Runoff Landscape	Provide free City mulch so it is completely free to customers for pickup. Goal would be to keep irrigation and storm water on site and reduce runoff. The benefit water savings would be to keep the soil moist for 2 to 3 weeks per year in the spring and fall.	4	2.9	2.5	3.6	3.7	**16.7**
Top Water Users Program (Top customers from each customer category)	Top water customers from each category would be offered a free water survey that would evaluate ways for the business to save water and money. The surveys would be for large accounts (such as, accounts that use more than 5,000 gallons of water per day) such as hotels, restaurants, stores and schools. Emphasis will be on supporting the top 25 users for each customer category.	4.5	3.2	3.2	3.5	2.9	**17.3**
Customized Top Users Incentive Program	After a free water use survey has been completed at site, the Utility will analyze the recommendations on the findings report that is provided and determine if site qualifies for a financial incentive. Financial incentives will be provided after analyzing the cost benefit ratio of each proposed project. Incentives are tailored to each individual site as each site has varying water savings potentials. Incentives will be granted at the sole discretion of the Utility while funding lasts. Incentive may include a rebate for a standard list of water efficient equipment.	3.9	3.5	3.3	3.3	2.5	**16.5**
CII Rebates to Replace Inefficient Equipment	In addition to Measure 33A's possible provision of a rebate for a standard list of water efficient equipment, this measure would include provisions for x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, and add conductivity meters on cooling towers. Pattern after San Diego County Water Authority or Seattle Water Department programs.	3.2	3.1	3	2.6	2.4	**14.3**
Water Savings Performance Program	Provide financial incentives per water units saved for sites within service area. Incentive is based on the potential for savings over 5 years. Eligible projects costs include labor, hardware and up to 1 year of water management fees. For example, water districts such as the East Bay Municipal Utility District and Metropolitan Water District of Southern California provide about $0.50 per 748 gallons (1 billing unit) saved to sites within their service area.	3.7	3	3.5	2.9	2.5	**15.6**
Require Plan Review for new CII	Require plan reviews for water use efficiency for all new business customers.	4.1	3.3	2.8	2.6	3.1	**15.9**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Promote Restaurant Spray Nozzles	Provide free high efficiency spray nozzles and possibly free installation for the rinse and clean operation in restaurants and other commercial kitchens. Thousands have been replaced in California going door-to-door, very cost-effective because saves hot water.	3.7	3	2.7	3.2	2.4	**15**
School Building Retrofit	School retrofit program wherein school receives a grant to replace fixtures and upgrade irrigation systems.	4.2	3.9	3.8	3.7	3.1	**18.7**
Focused Water Audits for Hotels/Motels	Proved free water audits to hotels and motels. Standardize on the types of services offered to reduce costs. Included would be bathrooms, kitchens, ice machines, laundry, cooling towers, landscaping, and irrigation systems and schedules.	3.4	3.3	3.6	3.2	2.8	**16.3**
Hotels/Motels Retrofit w/Financial Assistance	Following a free water audit offer motels a rebate for equipment identified that would save water. Or provide a rebate schedule for certain efficient equipment such as air-cooled ice machines that motels could apply for without an audit. Pattern after San Antonio, Texas program.	3.3	3.2	3.3	2.9	2	**14.7**
Rebates for Sub meters on Cooling Towers	Offer a rebate to buildings that install submeters to measure the make-up and bleed-off water of the facility cooling towers. Provide educational brochures and a phone contact of a knowledgeable person to provide conservation information.	3	2.8	2.8	2.9	2.2	**13.7**
Rebates for Conductivity Controllers on Cooling Towers	Offer a rebate to buildings that install conductivity controllers to reduce bleed-off water of the facility cooling towers. Provide educational brochures and a phone contact of a knowledgeable person to provide conservation information.	2.9	2.7	2.8	2.9	2.3	**13.6**
Cooling Tower Regulations	Prohibit discharge of cooling tower blow down unless the TDS of the water is at least a certain level (that would ensure 5-10 cycles of concentration). Pattern regulations after the State of Arizona.	3.1	2.6	2.3	1.9	2.2	**12.1**
Dry Vacuum Pump	Provide a rebate to assist CII with installation of dry vacuum pumps.	2.4	2.3	2.2	2.3	1.9	**11.1**
Conservation Print Media	Use a range of printed materials to raise awareness of conservation measures available to customers, including incentive programs offered by Utility. This can include newsletters, bill stuffers, brochures (self-developed or purchased), working with local newspapers, signage at retailers, signs on public buses. Regional participation and development can help assure consistent message. Such programs would continue indefinitely.	4.4	2.7	1.9	3.4	4	**16.4**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Electronic Conservation Options / Web Site / Social Media	Provide variety of conservation information on city or utility web site, distribution of "videos." Also consider social media options such as cell phone apps, Facebook, interactive kiosk with view screen, etc.	4.4	2.8	1.8	3.7	3.3	**16**
Speakers Bureau/ Event Participation	Conduct presentations at various venues, from radio and TV to service organizations and focused groups. Have booths at relevant community events. Participate in parades, etc.	3.9	2.4	1.6	3.5	3.5	**14.9**
Schools Education Programs	Work with local school districts to develop classroom programs that they would embrace. Consider poster contests, etc. Some programs would require dedicated utility staff to assist & present.	4.8	2.8	1.6	4.2	4.1	**17.5**
Media Campaign: such as the "Use Only What You Need" or "Beat the Peak"	Suggest a general "Use Only What You Need" message like Denver Water's program or a "Beat the Peak" message media campaign like Cary, North Carolina or Tucson Arizona: aahttp://cms3.tucsonaz.gov/water/beatthepeak . Also considered a program with focused action like: "Take Control of your Controller" Campaign for a focused social media based campaign as a media campaign. Consider determining appropriate usage and media campaign message with marketing study/focus groups.	4.1	2.6	1.8	3.7	3.8	**16**
Award Programs for Water Savings by Residences & Apartments Program	Providers would sponsor an annual awards program for residences and multi-family properties that significantly reduce water use. They would receive a plaque/recognition. This could include innovative customers that install compost toilets, gray-water, bio-swales and rainwater cisterns in an effort to maximize practical home water use efficiency.	3.9	2.4	2.6	3.2	3	**15.1**
Award Programs for Water Savings by Businesses	Providers would sponsor an annual awards program for businesses that significantly reduce water use. They would receive a plaque/recognition.	4	2.4	2.6	3	2.7	**14.7**
Outdoor Residential focused Public Awareness Information Program	Programs could continue efforts including poster contests, speakers to community groups, conservation hotline, website, video loan, radio and television time, demonstration gardens and printed educational material such as bill inserts, etc. Could also consider increasing current Utility efforts possibly adding social media such as cell phone apps, Facebook, interactive kiosk with view screen, etc. Program would continue indefinitely.	4.1	2.7	1.7	3.6	3.4	**15.5**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Efficient Outdoor Use Education and Training Programs	Utility would offer, organize and sponsor a series of educational workshops or other means for educating homeowners, landscapers and contractors in efficient landscaping and irrigation principals. Utilize guest speakers, native demonstration gardens, incentives, such as a nursery plant coupon.	3.8	2.9	2	3.3	3.4	**15.4**
Train Landscape Maintenance Workers (Green Gardener Program)	Utility would sponsor bilingual training for managers and workers in landscape maintenance methods that will save irrigation water. With some of these programs, names of businesses that have obtained training are included in Utility publications and/or Web sites (as an incentive to participate). Model after Green Gardener Program, Santa Barbara County Water Agency example: http://www.greengardener.org/	3.5	2.6	1.9	3	2.7	**13.7**
Networking with Landscaping Industry	Meet with and become members in "Green Industry" organizations; partner with projects and outreach material development. Outreach to nurseries for information distribution, provide "water wise plant" signage, etc.	3.6	2.4	1.5	2.6	2.4	**12.5**
Landscape Water Calculator	Develop Landscape Watering Calculator and Watering Index, and actively market these. Consider cell phone app with Watering Index.	4.2	3.3	2.8	3.3	3.5	**17.1**
Xeriscape Demonstration Gardens	Create a demonstration garden displaying living examples of low water-using gardens and landscaping. The Utility would provide signs and brochures to educate those people visiting the garden.	4.4	2.7	1.7	3.5	3.5	**15.8**
Promote Green Buildings	Assign Staff a position to work with local Green Building associations, developers, designers, vendors to promote incorporating water efficiency into building design. Possibly work with other partner utilities or agencies energy / wastewater / storm water. Co-sponsor award program.	4	2.9	2.1	2.9	3	**14.9**
Developer Financed Zero Footprint New Development	Utility would require developers of new homes to contribute money to the Utility's water conservation program to help generate the water needed to supply their project. Encourage or require use of bio-swales, rain water cisterns, graywater plumbing, etc.	3.7	2.9	2.3	1.5	2.1	**12.5**

Measure	Measure Description	Service Area Match	Long Term/ Permanent Water Savings	Savings Quantifiable	Customer Acceptance	Equity	Total Score
Prohibit Once through Cooling, Non-Recycling Fountains, Water Wasting Fixtures and Practices	Prohibit certain obvious wastes of water in new and existing facilities, such as those listed. Consider requiring retrofits of existing situations, allowing reasonable time for compliance.	3.6	3.3	2.8	2.1	2.4	**14.2**
Encourage "Life Cycle Analysis" Mentality of Sustainability and Reliability	Encourage customers to "save water" instead of "sell water". This is a suggested fundamental business model change that would focus on infrastructure delay or prevention by focusing on lowering production. Key would be to get customers to believe in this idea and message as well as management and directors. This is a paradigm shift to the importance of the entire "life cycle" cost of water including review and inclusion of the energy and Green House Gas components associated with each and every gallon of water use.	3.3	2.5	1.7	2.1	2.8	**12.4**
Tap Fee Credit	$1,000 tap fee credit if xeric landscape is put in front yards instead of turf grass.	4.5	4.1	3.6	3.4	3.4	**19**
Temp Water Areas	$0.00/sf tap fee cost for z-zone areas (temporary watering areas for establishment - native grasses, etc.).	4.3	4	3.5	3	3.1	**17.9**
Xeriscape Award	Utility would sponsor an annual awards program for residences, multi-family and commercial properties that install a xeriscape landscape and are nominated for the quality of the landscape. They would receive a plaque/recognition.	4.4	2.8	2.4	3.2	2.9	**15.7**
Soil Amendment Requirement	New turf areas must have the soil amended with 4 cubic yards/1,000 sf of amendment that is to be tilled to a depth of 4-6 inches. This will insure an appropriate soil for proper establishment of turf areas.	4.3	2.9	2.5	2.6	3.4	**15.7**

Appendix F: Conservation Measure Inputs and Results for the DSS Model

The information presented in this appendix is for each of the individual conservation measures included in the DSS Model analysis. The details of each measure such as fixture costs and savings assumptions are provided in this memo to document the key information that will be used by Aurora Water staff during conservation measure implementation. These values are based on the best available data and industry standards at the time this report was published and are projected out to 2040. It is recognized that some of these values may be adjusted on an annual basis (or at a minimum every 5 years when the IWMP is updated) to allow for updates in new information, ideas and technological developments. Avoided cost were not included in the analysis because calculations were ongoing as part of the IWMP at the time of publishing. Therefore, the benefit to cost ratio is not a true representation.

Water Loss Measure

Overview	
Name	Water Loss Measure
Abbr	1
Category	Default
Measure Type	Water Loss Measure

Time Period	
First Year	2014

Backlog Costs	
Total Backlog Work Costs	$0
Years to Complete Backlog	0

Maintenance Costs	
Annual Maintenance Costs	$213,082

Target	
Total GPCD Reduction	0.2

Description

Measure includes a combination of leak detection (correlators, loggers and listening devices), meter testing and replacement, and a system audit using the AWWA M36 form for all water produced but not sold.
MEASURE ALREADY IN PLACE

Comments

Depts: T&D/ENG
Cost: $205,382 for leak detection team (2013 HB1051) and 200 hrs of engineers to complete AWWA M36 reporting. Meter testing cost of 1 FTE isn't included because does not contribute significantly to water loss prevention.
Savings: GPCD reduction confirmed by Aurora Water Staff. Modified by MWM 11/21/14 to reflect more realistic NRW savings.
Other: This measure does not include backlog because system already very efficient (<5% real loss according to Aurora Water staff). Loss percentage will increase as system grows older.

Results	
Average Water Savings (mgd)	
0.092604	
Lifetime Savings - Present Value ($)	
Utility	$140,013
Community	$140,013
Lifetime Costs - Present Value ($)	
Utility	$4,858,410
Community	$4,858,410
Benefit to Cost Ratio	
Utility	0.03
Community	0.03
Cost of Savings per Unit Volume ($/mg)	
Utility	$3,882

AMI and Leak Notice

Overview	
Name	AMI and Leak Notice
Abbr	2
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2019
Last Year	2025
Measure Length	7

Measure Life	
Permanent	☑

Fixture Costs

	Utility	Customer	Fix/Acct
R	$170.00	$0.00	1
MF	$170.00	$0.00	1
C	$170.00	$0.00	1
IR	$170.00	$0.00	1

Administration Costs	
Markup Percentage	25%

Description

Measure will replace AMR meters with AMI meters. Some costs to the system are offset by operational efficiency and reduced staffing. Also enables enhanced billing options (such as notifying customers of potential leaks) and the ability to monitor unauthorized usage (such as use/tampering with closed accounts or irrigation if time of day or days per week are regulated).

Comments

Other Depts: METERSHOP/BILLING/PR
Cost: Difference in cost per meter between AMR and AMI is $100. Upkeep is $10/yr which over the course of 7 years is $70. Staff cost includes one hour to install plus an average $4 per meter for Billing to contact customers with possible leaks and to cover PR efforts.
Savings: Used SoCals estimate of 10% savings for internal and external leakage
Other:

Customer Classes

	R	MF	C	IR
	☑	☑	☑	☑

End Uses

	R	MF	C	IR
Toilets	☐	☐	☐	
Urinals			☐	
Faucets	☐	☐	☐	
Showers	☐	☐	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☐	☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage	☑	☑	☑	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☐	☐	☐	☐
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☑	☑	☑	☑

Results

Average Water Savings (mgd)	
0.333511	
Lifetime Savings - Present Value ($)	
Utility	$6,373,695
Community	$6,373,695
Lifetime Costs - Present Value ($)	
Utility	$15,269,687
Community	$15,269,687
Benefit to Cost Ratio	
Utility	0.42
Community	0.42
Cost of Savings per Unit Volume ($/mg)	
Utility	$3,388

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Internal Leakage	10.0%
MF Internal Leakage	10.0%
C Internal Leakage	10.0%
R External Leakage	10.0%
MF External Leakage	10.0%
C External Leakage	10.0%
IR External Leakage	10.0%

Targets

	Percentage
Target Method	
% of Accts Targeted / yr	14.280%
Only Effects New Homes	☐

Water Budget Based Billing

Overview	
Name	Water Budget Based Billing
Abbr	3
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2021
Last Year	2050
Measure Length	30

Measure Life	
Permanent	☐
Years	8
Repeat	☑

Fixture Costs

	Utility	Customer	Fix/Acct
R	$9.38	$5.00	1
MF	$17.38	$5.00	1
C	$17.38	$10.00	1
IR	$17.38	$10.00	1

Administration Costs	
Markup Percentage	15%

Description

Develop individualized monthly water budgets for all customers. Water budgets are linked to a rate schedule where rates per unit of water increase when a customer goes above their budget. Budgets are based on size of the irrigated area and average indoor use estimates. These rates have proven to be effective in reducing landscape irrigation demand (AWWARF Reports). Would require rate study and capable billing software.

Comments

Depatments: Aurora Water PR

Cost: 1 hr staff time per MF/C/IRR meter on average to establish outdoor budget. $500,000 overall for initial setup (including Billing software overhaul). $250,000 overall for adjusting and improving the program. Markup includes one FTE to run variance program, rate study, and marketing efforts. Customer cost represents average amount to implement any water savings actions by customers as a result of their budget.

Savings: Using variance program and AMEC grant data Aurora estimates on average customers are 16% over efficient. Customers on average will become slightly more efficient use due to the cost of being inefficient. Measure life of 8 years is based on national turnover rate in housing. Assumes when a person moves that the landscaping might change and therefore impact water savings.

Other: 10/13 call: 100% targeted annually, BUT only 25% assumed to respond. 4 year roll-out.

Customer Classes

	R	MF	C	IR
	☑	☑	☑	☑

End Uses

	R	MF	C	IR
Toilets	☐	☐	☐	
Urinals			☐	
Faucets	☑	☑	☐	
Showers	☑	☑	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☑	☑	☐	
Process			☐	
chen Spray Rinse			☐	
Internal Leakage	☐	☐	☐	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☑	☑	☑	☑
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☐	☐	☐	☐

Results

Average Water Savings (mgd)	
0.733054	
Lifetime Savings - Present Value ($)	
Utility	$2,498,786
Community	$4,717,692
Lifetime Costs - Present Value ($)	
Utility	$4,456,196
Community	$6,481,916
Benefit to Cost Ratio	
Utility	0.56
Community	0.73
Cost of Savings per Unit Volume ($/mg)	
Utility	$450

Savings Per Replacement

☑ Saves Hot Water

	% Savings per Account
R Faucets	0.5%
MF Faucets	0.5%
R Showers	0.5%
MF Showers	0.5%
R Clothes Washers	0.5%
MF Clothes Washers	0.5%
R Irrigation	3.0%
MF Irrigation	1.5%
C Irrigation	1.5%
IR Irrigation	3.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	25.000%
Only Effects New Homes	☐

Single-family Residential (SFR) Water Audits

Overview

Name	SFR Water Audits
Abbr	4
Category	Default Plumbing Code
Measure Type	Standard Measure

Time Period

First Year	2014
Last Year	2050
Measure Length	37

Measure Life

Permanent	☐
Years	5
Repeat	☑

Fixture Costs

	Utility	Customer	Fix/Acct
R	$53.13	$10.00	1

Administration Costs

Markup Percentage	21%

Description

Indoor water surveys for existing single family residential customers. Target those with high water use and provide a customized report to owner. May include give-away of efficient shower heads and aerators.
MEASURE ALREADY IN PLACE

Comments

Depts:
Cost: Markup cost assumes 15 min travel time and $2 (water audit kit, showerheads). Fixture cost assumed to be 1:15 hr of staff time + $5 in vehicle cost. Customer cost is an estimate of repairs.
Savings: Total savings matches 2013 program data. Savings assume 30% of audited accounts follow audit instructions.
Other:

Customer Classes

	R	MF	C	IR
	☑	☐	☐	☐

End Uses

	R	MF	C	IR
Toilets	☑			
Urinals				
Faucets	☑			
Showers	☑			
Dishwashers	☐			
Clothes Washers	☐			
Process				
Kitchen Spray Rinse				
Internal Leakage	☑			
Baths	☐			
Other	☐			
Irrigation	☐			
Pools	☐			
Wash Down	☐			
Car Washing	☐			
External Leakage	☐			

Results

Average Water Savings (mgd)	
0.010242	
Lifetime Savings - Present Value ($)	
Utility	$289,544
Community	$590,175
Lifetime Costs - Present Value ($)	
Utility	$366,448
Community	$423,450
Benefit to Cost Ratio	
Utility	0.79
Community	1.39
Cost of Savings per Unit Volume ($/mg)	
Utility	$2,647

Savings Per Replacement

☑ Saves Hot Water

	% Savings per Account
R Toilets	2.0%
R Faucets	12.0%
R Showers	12.0%
R Internal Leakage	12.0%

Targets

Target Method	Count
# of Accts Targeted / yr	250

Multi-family (MF) Water Audits

Overview	
Name	MF Water Audits
Abbr	5
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2014
Last Year	2050
Measure Length	37

Measure Life	
Permanent	☐
Years	5
Repeat	☑

Fixture Costs	Utility	Customer	Fix/Acct
MF	$385.00	$200.00	1

Administration Costs	
Markup Percentage	25%

Description

Indoor water surveys for existing multifamily residential customers (5 units or more). Target those with high water use and provide a customized report to owner. Usually combined with outdoor surveys (see Irrigation Measures). MEASURE ALREADY IN PLACE

Comments

Depts:
Cost: Markup cost includes kits and vehicle cost. Fixture cost is 10 hrs of staff time. Customer cost is an estimate of repairs.
Savings: Total savings matches 2013 program data. Savings assume 30% of audited accounts follow audit instructions (Tess).
Other:

Customer Classes

	R	MF	C	IR
	☐	☑	☐	☐

End Uses

	R	MF	C	IR
Toilets		☑		
Urinals				
Faucets		☑		
Showers		☑		
Dishwashers		☐		
Clothes Washers		☐		
Process				
Kitchen Spray Rinse				
Internal Leakage		☑		
Baths		☐		
Other		☐		
Irrigation		☐		
Pools		☐		
Wash Down		☐		
Car Washing		☐		
External Leakage		☐		

Results	
Average Water Savings (mgd)	
0.008148	
Lifetime Savings - Present Value ($)	
Utility	$229,135
Community	$426,585
Lifetime Costs - Present Value ($)	
Utility	$164,592
Community	$232,994
Benefit to Cost Ratio	
Utility	1.39
Community	1.83
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,495

Savings Per Replacement

☑ Saves Hot Water

	% Savings per Account
MF Toilets	2.0%
MF Faucets	6.0%
MF Showers	6.0%
MF Internal Leakage	10.0%

Targets	
Target Method	Count
# of Accts Targeted / yr	15

SF (Single-family) Leak Repair Assistance

Overview	
Name	SF Leak Repair Assistance
Abbr	6
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2014
Last Year	2050
Measure Length	37

Measure Life	
Permanent	☐
Years	5
Repeat	☑

Fixture Costs	Utility	Customer	Fix/Acct
R	$225.00	$150.00	1

Administration Costs	
Markup Percentage	5%

Description

Customer leaks often occur at properties where owners are least able to pay costs of repair. This measure requires that customer leaks be repaired, and issues a credit to their account to cover leak usage.
MEASURE ALREADY IN PLACE

Comments

Depts: BILLING
Cost: Fixture cost comes from 2013 program averages/account + 2 hrs of staff time. Markup is for misc. overhead.
Savings: 80% of TOTAL leakage would be saved for a 5 year period after the repair with 40% savings internally and 40% saving externally.
Other: This measure targets a small amount of customers and so leakage savings is not expected to be redundant.

Customer Classes

	R	MF	C	IR
	☑	☐	☐	☐

End Uses

	R	MF	C	IR
Toilets	☐			
Urinals				
Faucets	☐			
Showers	☐			
Dishwashers	☐			
Clothes Washers	☐			
Process				
Kitchen Spray Rinse				
Internal Leakage	☑			
Baths	☐			
Other	☐			
Irrigation	☐			
Pools	☐			
Wash Down	☐			
Car Washing	☐			
External Leakage	☑			

Results

Average Water Savings (mgd)	
0.009090	
Lifetime Savings - Present Value ($)	
Utility	$207,823
Community	$207,823
Lifetime Costs - Present Value ($)	
Utility	$1,260,029
Community	$2,060,048
Benefit to Cost Ratio	
Utility	0.16
Community	0.10
Cost of Savings per Unit Volume ($/mg)	
Utility	$10,257

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Internal Leakage	40.0%
R External Leakage	40.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	0.310%
Only Effects New Homes	☐

HE (High Efficiency) Urinal Rebate

Overview

Name	HE Urinal Rebate
Abbr	9
Category	Default
Measure Type	Standard Measure

Time Period

First Year	2016
Last Year	2025
Measure Length	10

Measure Life

Permanent	☑

Fixture Costs

	Utility	Customer	Fix/Acct
C	$100.00	$300.00	5

Administration Costs

Markup Percentage	39%

Description

Provide a rebate for installating high efficiency urinals. WaterSense standard is .25 gpf or less, though models flushing as low as 0.125 gpf (1 pint) are available and function well, so could be specified. Waterless urinals are also available.

Comments

Depts:
Cost: Added one hour of staff cost.
Savings: Copied CA savings because that municipality already had experience with this measure.
Other:

Customer Classes

R	MF	C	IR
☐	☐	☑	☐

End Uses

	R	MF	C	IR
Toilets			☐	
Urinals			☑	
Faucets			☐	
Showers			☐	
Dishwashers			☐	
Clothes Washers			☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage			☐	
Baths				
Other			☐	
Irrigation			☐	
Pools				
Wash Down			☐	
Car Washing				
External Leakage			☐	

Results

Average Water Savings (mgd)	
0.004870	
Lifetime Savings - Present Value ($)	
Utility	$131,151
Community	$131,151
Lifetime Costs - Present Value ($)	
Utility	$163,708
Community	$517,035
Benefit to Cost Ratio	
Utility	0.80
Community	0.25
Cost of Savings per Unit Volume ($/mg)	
Utility	$2,487

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
C Urinals	75.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Homes	☐

Gov Blg (Government Building) Fixtures

Overview	
Name	Gov Blg Fixtures
Abbr	10
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2019
Measure Length	5

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
C	$100.00	$40.00	10

Administration Costs	
Markup Percentage	15%

Description

Install high efficiency faucets, toilet retrofits, and showerheads in City or Utility facilities.

Comments

Depts:
Cost: Used CA's cost estimates.
Savings: The switch between fixtures will save about 50%. However, the percentages are lower to reflect that not all govt buildings have the fixtures (such as showers) or will replace all of them.
Other: 11% of C meters are city meters. 2.2 target divided in half because not everyone will participate. Some toilets won't be replaced, they will just be retrofitted (similar to Denver Water). Will inspect urinals but may or may not be able to be retrofits. There are two recreation centers owned by the City that have locker rooms.

Customer Classes	R	MF	C	IR
	☐	☐	☑	☐

End Uses	R	MF	C	IR
Toilets			☑	
Urinals			☐	
Faucets			☑	
Showers			☑	
Dishwashers			☐	
Clothes Washers			☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage			☐	
Baths				
Other			☐	
Irrigation			☐	
Pools				
Wash Down			☐	
Car Washing				
External Leakage			☐	

Results	
Average Water Savings (mgd)	
0.014217	
Lifetime Savings - Present Value ($)	
Utility	$400,021
Community	$584,081
Lifetime Costs - Present Value ($)	
Utility	$152,523
Community	$205,575
Benefit to Cost Ratio	
Utility	2.62
Community	2.84
Cost of Savings per Unit Volume ($/mg)	
Utility	$794

Savings Per Replacement

☑ Saves Hot Water

	% Savings per Account
C Toilets	31.5%
C Faucets	37.5%
C Showers	25.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.100%
Only Effects New Homes	☐

Irrigation Audits

Overview

Name	Irrigation Audits
Abbr	11
Category	Default
Measure Type	Standard Measure

Time Period

First Year	2014
Last Year	2050
Measure Length	37

Measure Life

Permanent	☐
Years	5
Repeat	☑

Fixture Costs

	Utility	Customer	Fix/Acct
R	$164.00		1
MF	$300.00		1
C	$300.00		1
IR	$300.00		1

Administration Costs

Markup Percentage	30%

Description

Outdoor water audits offered for existing customers. Audits are marked to all Aurora Water customers, those with high water use are targeted, and all participants areprovided a customized report on how to save water. Currently completion is necessary to qualify for irrigation rebate.

Comments

Depts:
Cost: Residential budget $28512/173 audits. Large Property budget $25721/86 total meters audited. Markup includes set up cost of $15576/ 199 audits (not meter numbers)
Savings: Savings match known savings from 2013.
Other:

Customer Classes

R	MF	C	IR
☑	☑	☑	☑

End Uses

	R	MF	C	IR
Toilets	☐	☐	☐	
Urinals			☐	
Faucets	☐	☐	☐	
Showers	☐	☐	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☐	☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage	☐	☐	☐	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☑	☑	☑	☑
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☑	☑	☑	☑

Results

Average Water Savings (mgd)	
0.049260	
Lifetime Savings - Present Value ($)	
Utility	$75,318
Community	$75,318
Lifetime Costs - Present Value ($)	
Utility	$1,474,565
Community	$1,474,565
Benefit to Cost Ratio	
Utility	0.05
Community	0.05
Cost of Savings per Unit Volume ($/mg)	
Utility	$2,215

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Irrigation	7.0%
MF Irrigation	16.0%
C Irrigation	16.0%
IR Irrigation	20.0%
R External Leakage	75.0%
MF External Leakage	75.0%
C External Leakage	75.0%
IR External Leakage	75.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	0.350%
Only Effects New Homes	☐

SF (Single-family) Xeriscape Rebate (Landscape Conversion)

Overview	
Name	SF Landscape Conversion
Abbr	12
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2014
Last Year	2050
Measure Length	37

Measure Life	
Permanent	☐
Years	15
Repeat	☑

Fixture Costs	Utility	Customer	Fix/Acct
R	$1,741.00	$677.05	1

Administration Costs	
Markup Percentage	33%

Description

Provide a per square foot incentive to remove turf and replace with low water use plants and hardscape. A rebate of up to $1 per square foot replaced with xeric plant material is given and capped at an upper limit of $10,000 for single family residence.
MEASURE ALREADY IN PLACE

Comments

Depts:
Cost: Customer cost is 28% of total cost (estimated using % installed by homeowner)= $677.05. Average customer rebate since program inception in 2007 is $1741.00. Staff cost is 15 hours.
Savings: Estimated using Aurora's average historic Xersicape savings.
Other: Repeat every 15 years - double rate of turnover.

Customer Classes	R	MF	C	IR
	☑	☐	☐	☐

End Uses	R	MF	C	IR
Toilets	☐			
Urinals				
Faucets	☐			
Showers	☐			
Dishwashers	☐			
Clothes Washers	☐			
Process				
Kitchen Spray Rinse				
Internal Leakage	☐			
Baths	☐			
Other	☐			
Irrigation	☑			
Pools	☐			
Wash Down	☐			
Car Washing	☐			
External Leakage	☐			

Results	
Average Water Savings (mgd)	
0.003225	
Lifetime Savings - Present Value ($)	
Utility	$4,585
Community	$4,585
Lifetime Costs - Present Value ($)	
Utility	$2,639,781
Community	$3,411,640
Benefit to Cost Ratio	
Utility	0.00
Community	0.00
Cost of Savings per Unit Volume ($/mg)	
Utility	$60,575

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Irrigation	9.0%

Targets	
Target Method	Count
# of Accts Targeted / yr	50

LP (Large Property) Xeriscape Rebate (Landscape Conversion MF/C/IR)

Overview

Name	LP Landscape Conversion
Abbr	13
Category	Default
Measure Type	Standard Measure

Time Period

First Year	2014
Last Year	2050
Measure Length	37

Measure Life

Permanent	☐
Years	15
Repeat	☑

Fixture Costs

	Utility	Customer	Fix/Acct
MF	$1,574.58	$1,140.21	1
C	$1,574.58	$1,140.21	1
IR	$1,574.58	$1,140.21	1

Administration Costs

Markup Percentage	36%

Description

Provide a per square foot incentive to remove turf and replace with low water use plants and hardscape. Includes a rebate of up to $1 per square foot replaced with xeric plant material, capped at an upper limit of $25,000 for multi-family or commercial residence.
MEASURE ALREADY IN PLACE

Comments

Depts:
Cost: Customer cost is 42% of total cost to cover installation. Average rebate given per meter is $1574.58. Markup represents 15 staff hours.
Savings: Savings from Metro of SoCal
Other:

Customer Classes

R	MF	C	IR
☐	☑	☑	☑

End Uses

	R	MF	C	IR
Toilets		☐	☐	
Urinals			☐	
Faucets		☐	☐	
Showers		☐	☐	
Dishwashers		☐	☐	
Clothes Washers		☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage		☐	☐	
Baths		☐		
Other		☐	☐	
Irrigation		☑	☑	☑
Pools		☐		
Wash Down		☐	☐	
Car Washing		☐		
External Leakage		☐	☐	☐

Results

Average Water Savings (mgd)	
0.033458	
Lifetime Savings - Present Value ($)	
Utility	$47,244
Community	$47,244
Lifetime Costs - Present Value ($)	
Utility	$330,024
Community	$505,746
Benefit to Cost Ratio	
Utility	0.14
Community	0.09
Cost of Savings per Unit Volume ($/mg)	
Utility	$730

Savings Per Replacement

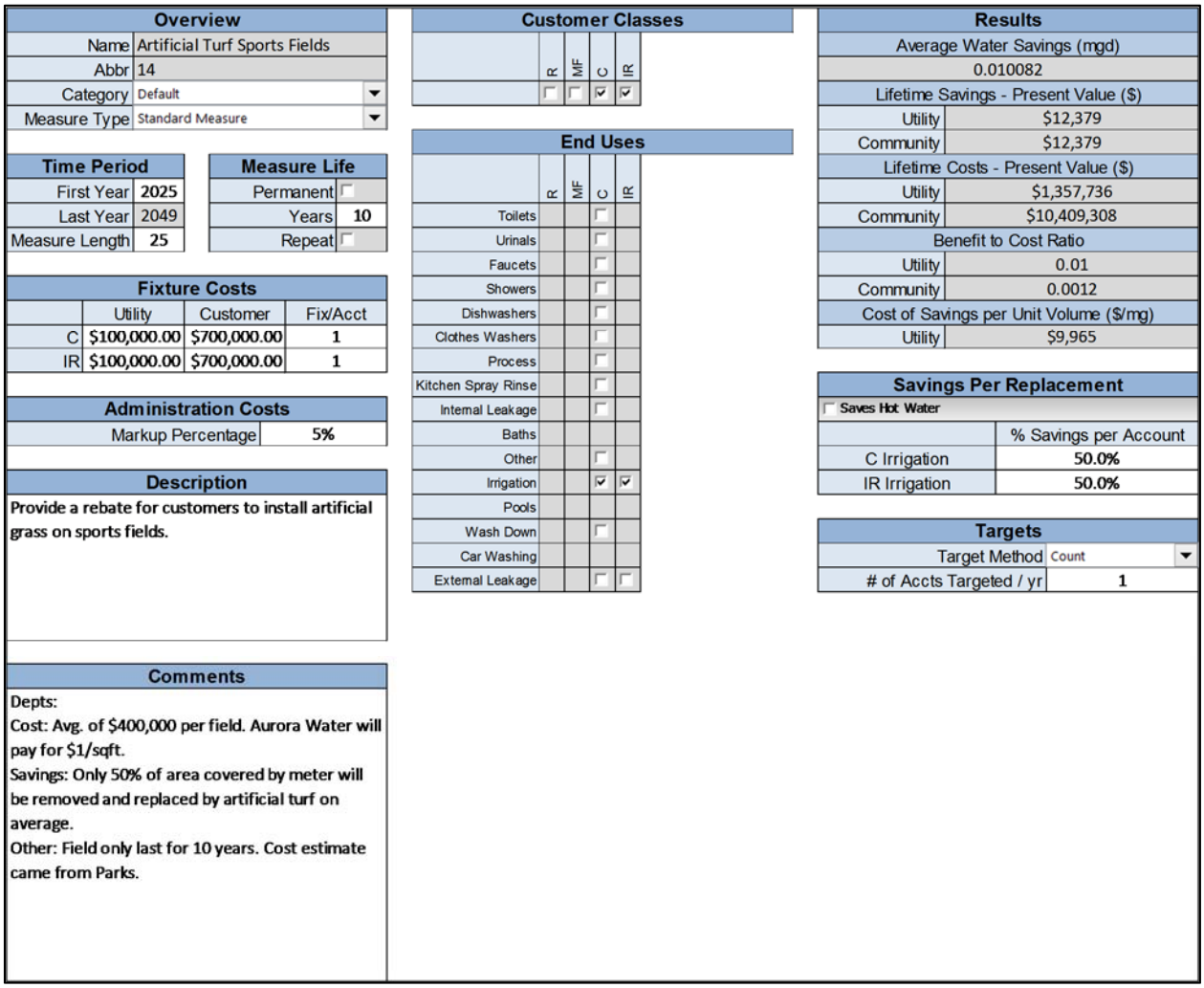
☐ Saves Hot Water

	% Savings per Account
MF Irrigation	23.0%
C Irrigation	23.0%
IR Irrigation	23.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	0.100%
Only Effects New Homes	☐

Artificial Turf Sports Field



Overview	
Name	Artificial Turf Sports Fields
Abbr	14
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2025
Last Year	2049
Measure Length	25

Measure Life	
Permanent	☐
Years	10
Repeat	☐

Fixture Costs

	Utility	Customer	Fix/Acct
C	$100,000.00	$700,000.00	1
IR	$100,000.00	$700,000.00	1

Administration Costs	
Markup Percentage	5%

Description

Provide a rebate for customers to install artificial grass on sports fields.

Comments

Depts:
Cost: Avg. of $400,000 per field. Aurora Water will pay for $1/sqft.
Savings: Only 50% of area covered by meter will be removed and replaced by artificial turf on average.
Other: Field only last for 10 years. Cost estimate came from Parks.

Customer Classes

	R	MF	C	IR
	☐	☐	☑	☑

End Uses

	R	MF	C	IR
Toilets			☐	
Urinals			☐	
Faucets			☐	
Showers			☐	
Dishwashers			☐	
Clothes Washers			☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage			☐	
Baths				
Other			☐	
Irrigation			☑	☑
Pools				
Wash Down			☐	
Car Washing				
External Leakage			☐	☐

Results

Average Water Savings (mgd)	
0.010082	
Lifetime Savings - Present Value ($)	
Utility	$12,379
Community	$12,379
Lifetime Costs - Present Value ($)	
Utility	$1,357,736
Community	$10,409,308
Benefit to Cost Ratio	
Utility	0.01
Community	0.0012
Cost of Savings per Unit Volume ($/mg)	
Utility	$9,965

Savings Per Replacement

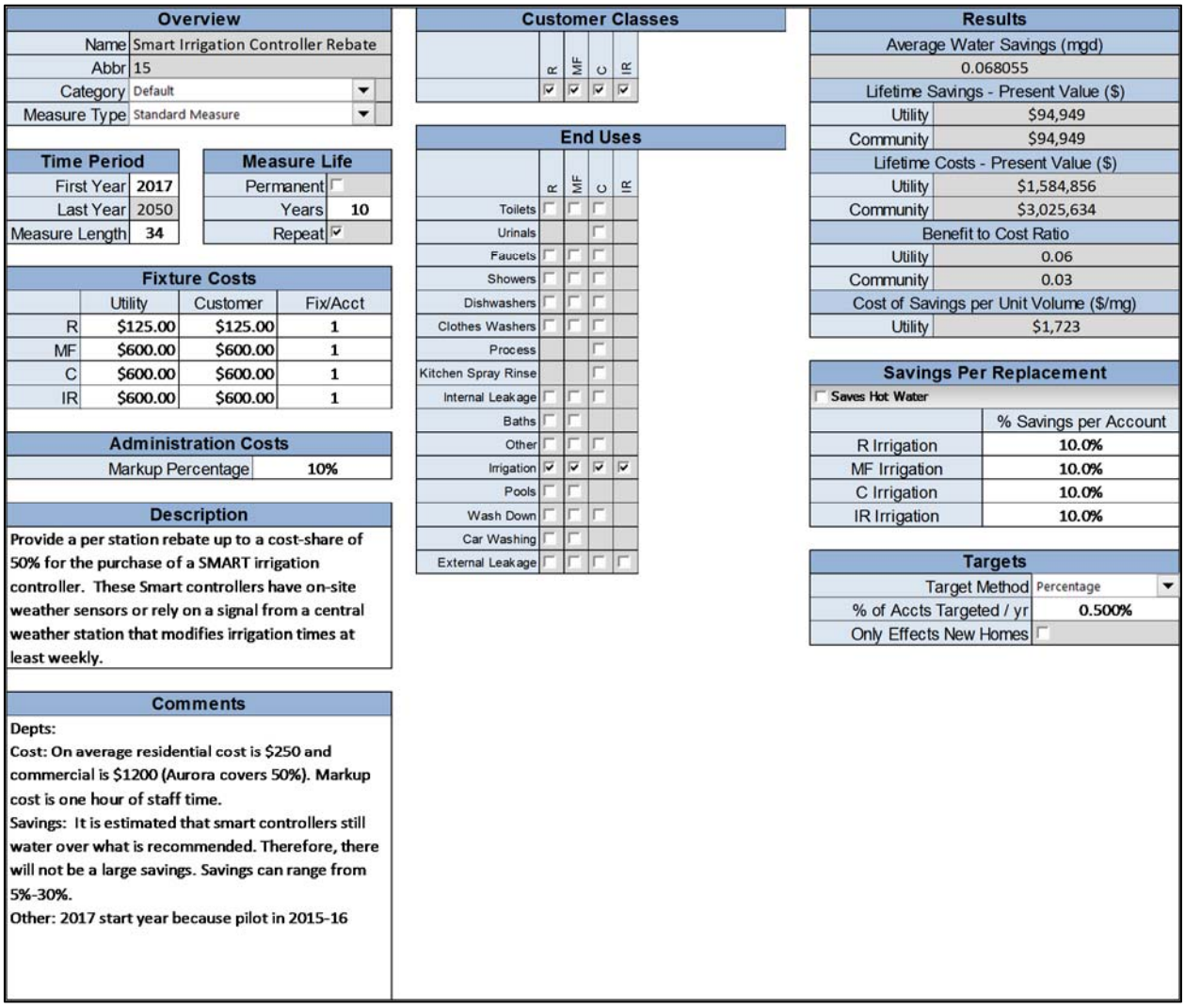
☐ Saves Hot Water

	% Savings per Account
C Irrigation	50.0%
IR Irrigation	50.0%

Targets

Target Method	Count
# of Accts Targeted / yr	1

Smart Irrigation Controller Rebate



Overview

Name	Smart Irrigation Controller Rebate
Abbr	15
Category	Default
Measure Type	Standard Measure

Time Period

First Year	2017
Last Year	2050
Measure Length	34

Measure Life

Permanent	☐
Years	10
Repeat	☑

Fixture Costs

	Utility	Customer	Fix/Acct
R	$125.00	$125.00	1
MF	$600.00	$600.00	1
C	$600.00	$600.00	1
IR	$600.00	$600.00	1

Administration Costs

Markup Percentage	10%

Description

Provide a per station rebate up to a cost-share of 50% for the purchase of a SMART irrigation controller. These Smart controllers have on-site weather sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly.

Comments

Depts:
Cost: On average residential cost is $250 and commercial is $1200 (Aurora covers 50%). Markup cost is one hour of staff time.
Savings: It is estimated that smart controllers still water over what is recommended. Therefore, there will not be a large savings. Savings can range from 5%-30%.
Other: 2017 start year because pilot in 2015-16

Customer Classes

R	MF	C	IR
☑	☑	☑	☑

End Uses

	R	MF	C	IR
Toilets	☐	☐	☐	
Urinals			☐	
Faucets	☐	☐	☐	
Showers	☐	☐	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☐	☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage	☐	☐	☐	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☑	☑	☑	☑
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☐	☐	☐	☐

Results

Average Water Savings (mgd)	
0.068055	
Lifetime Savings - Present Value ($)	
Utility	$94,949
Community	$94,949
Lifetime Costs - Present Value ($)	
Utility	$1,584,856
Community	$3,025,634
Benefit to Cost Ratio	
Utility	0.06
Community	0.03
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,723

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Irrigation	10.0%
MF Irrigation	10.0%
C Irrigation	10.0%
IR Irrigation	10.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	0.500%
Only Effects New Homes	☐

Rain Sensor Only Rebate

Overview	
Name	Rain Sensor Rebate
Abbr	16
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2024
Measure Length	10

Measure Life	
Permanent	☐
Years	5
Repeat	☑

Fixture Costs

	Utility	Customer	Fix/Acct
R	$66.00	$20.00	1
MF	$66.00	$25.00	1
C	$66.00	$25.00	1
IR	$66.00	$25.00	1

Administration Costs	
Markup Percentage	5%

Description

Provide a rebate for rain sensor shut-off devices for existing irrigation controllers. These cancel scheduled sprinkling when sufficient rain has been received. Rain sensor rebates are currently available with an irrigation audit. This measure represents a rebate with no irrigation audit requirment.

Comments

Depts:
Cost: Avg. cost of rainsensor + 1 hr of staff time.
Markup covers the remaining few dollars for staff time.
Savings: Estimated.
Other: On average, $15 for wired and $50 for wireless.
Aurora covers 50%.
IN MWM review 11/21/14, increased targets and reduced measure time period to represent more realistic implementation plan.

Customer Classes

R	MF	C	IR
☑	☑	☑	☑

End Uses

	R	MF	C	IR
Toilets	☐	☐	☐	
Urinals			☐	
Faucets	☐	☐	☐	
Showers	☐	☐	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☐	☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage	☐	☐	☐	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☑	☑	☑	☑
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☐	☐	☐	☐

Results

Average Water Savings (mgd)	
0.002147	
Lifetime Savings - Present Value ($)	
Utility	$3,226
Community	$3,226
Lifetime Costs - Present Value ($)	
Utility	$75,388
Community	$97,556
Benefit to Cost Ratio	
Utility	0.04
Community	0.03
Cost of Savings per Unit Volume ($/mg)	
Utility	$2,598

Savings Per Replacement

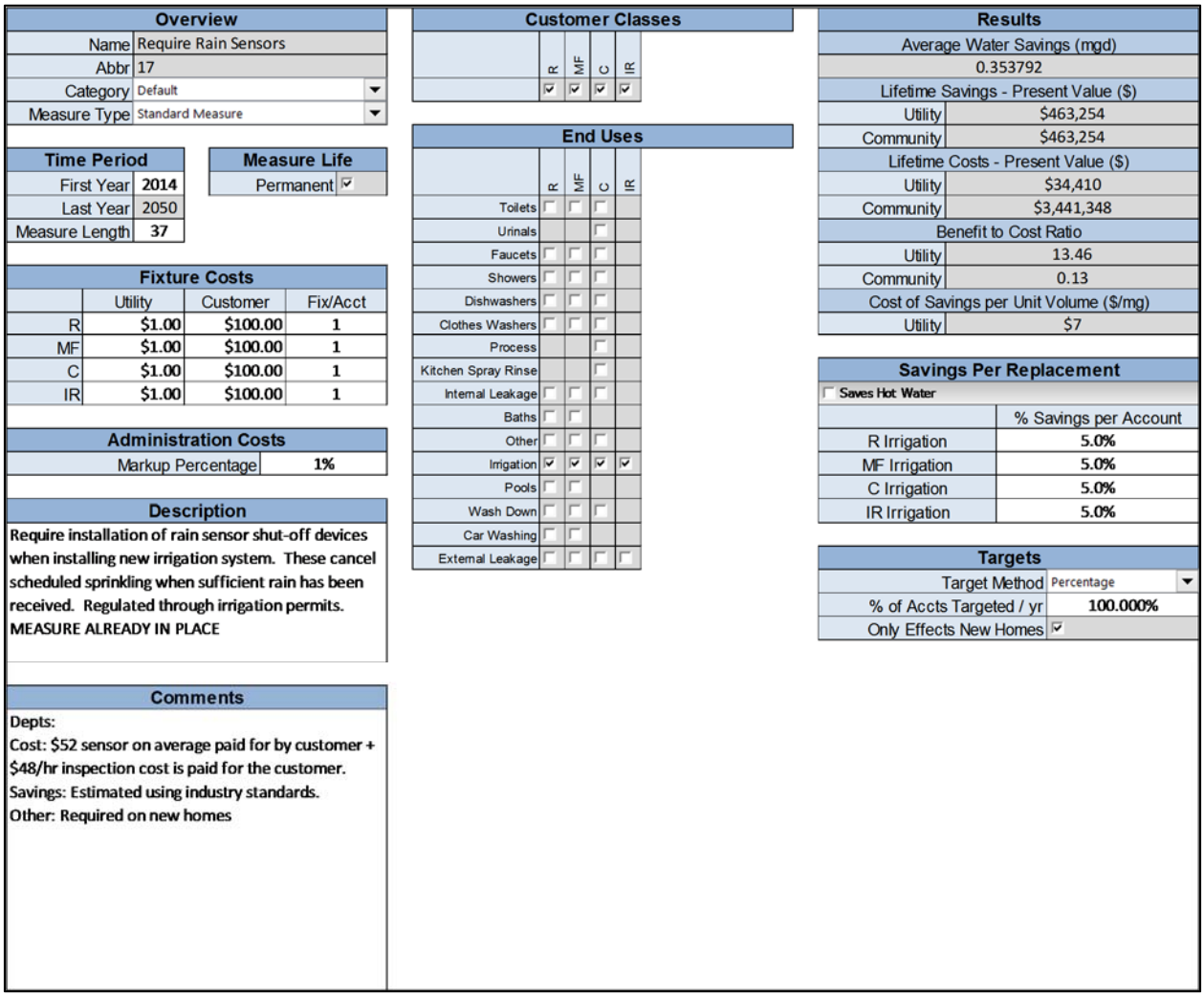
☐ Saves Hot Water

	% Savings per Account
R Irrigation	5.0%
MF Irrigation	5.0%
C Irrigation	5.0%
IR Irrigation	5.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	0.060%
Only Effects New Homes	☐

Require Rain Sensor



Overview	
Name	Require Rain Sensors
Abbr	17
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2014
Last Year	2050
Measure Length	37

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
R	$1.00	$100.00	1
MF	$1.00	$100.00	1
C	$1.00	$100.00	1
IR	$1.00	$100.00	1

Administration Costs	
Markup Percentage	1%

Description

Require installation of rain sensor shut-off devices when installing new irrigation system. These cancel scheduled sprinkling when sufficient rain has been received. Regulated through irrigation permits. MEASURE ALREADY IN PLACE

Comments

Depts:
Cost: $52 sensor on average paid for by customer + $48/hr inspection cost is paid for the customer.
Savings: Estimated using industry standards.
Other: Required on new homes

Customer Classes

	R	MF	C	IR
	☑	☑	☑	☑

End Uses

	R	MF	C	IR
Toilets	☐	☐	☐	
Urinals			☐	
Faucets	☐	☐	☐	
Showers	☐	☐	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☐	☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage	☐	☐	☐	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☑	☑	☑	☑
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☐	☐	☐	☐

Results

Average Water Savings (mgd)	
0.353792	
Lifetime Savings - Present Value ($)	
Utility	$463,254
Community	$463,254
Lifetime Costs - Present Value ($)	
Utility	$34,410
Community	$3,441,348
Benefit to Cost Ratio	
Utility	13.46
Community	0.13
Cost of Savings per Unit Volume ($/mg)	
Utility	$7

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Irrigation	5.0%
MF Irrigation	5.0%
C Irrigation	5.0%
IR Irrigation	5.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	100.000%
Only Effects New Homes	☑

Efficient Sprinkler Part Replacement (i.e. Irrigation Rebate)

Overview	
Name	Efficient Sprinkler Part Replacement
Abbr	18
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2014
Last Year	2050
Measure Length	37

Measure Life	
Permanent	☐
Years	10
Repeat	☑

Fixture Costs	Utility	Customer	Fix/Acct
R	$3.00	$3.00	20
MF	$9.00	$9.00	30
C	$34.00	$34.00	50
IR	$34.00	$34.00	50

Administration Costs	
Markup Percentage	10%

Description

Provide rebates to replace inefficient automatic sprinkler heads, nozzles, and conrollers. Also includes spray to drip conversions. Must recieve irrigation audit to qualify. MEASURE ALREADY IN PLACE

Comments

Depts:
Cost: Used CA data because Aurora has low number of rebates/year and large variation in rebate amounts.
Savings: MWD So Cal Water Smart website says 20% savings, Aurora conservative and reduced savings to 10%. Manufactures claim 25% increase in savings with efficient irrigation parts instead of department store parts. Realistically savings will not be that high.
Other: Aurora covers half of the cost on average.

Customer Classes	R	MF	C	IR
	☑	☑	☑	☑

End Uses	R	MF	C	IR
Toilets	☐	☐	☐	
Urinals			☐	
Faucets	☐	☐	☐	
Showers	☐	☐	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☐	☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage	☐	☐	☐	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☑	☑	☑	☑
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☐	☐	☐	☐

Results	
Average Water Savings (mgd)	
0.014072	
Lifetime Savings - Present Value ($)	
Utility	$20,654
Community	$20,654
Lifetime Costs - Present Value ($)	
Utility	$298,236
Community	$569,360
Benefit to Cost Ratio	
Utility	0.07
Community	0.04
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,568

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Irrigation	10.0%
MF Irrigation	10.0%
C Irrigation	10.0%
IR Irrigation	10.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	0.100%
Only Effects New Homes	☐

Water Conserving Landscape Code

Overview	
Name	Water Conserving Landscape Code
Abbr	19
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2014
Last Year	2050
Measure Length	37

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
R	$1.00	$900.00	1
MF	$1.00	$3,400.00	1
C	$1.00	$3,400.00	1
IR	$1.00	$6,400.00	1

Administration Costs	
Markup Percentage	1%

Description

Develop and enforce Water Efficient Landscape Design Standards. Standards specify that development projects subject to design review be landscaped according to Xeriscape principals with appropriate turf ratios, plant selection, efficient irrigation systems and smart irrigation controllers.
MEASURE ALREADY IN PLACE

Comments

Depts: PLANNING/PUBLIC WORKS
Cost: Average cost for planning to review Mylar + average cost for public works to confirm customer is meeting code + increased material cost ($1,400 large properties) ($800 residential)
Savings: Estimate based on industry standards.
Other: Tracking and enforcement for small properties done through planning. Large property tracking done through conservation department.

Customer Classes	R	MF	C	IR
	☑	☑	☑	☑

End Uses	R	MF	C	IR
Toilets	☐	☐	☐	
Urinals			☐	
Faucets	☐	☐	☐	
Showers	☐	☐	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☐	☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage	☐	☐	☐	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☑	☑	☑	☑
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☐	☐	☐	☐

Results	
Average Water Savings (mgd)	
0.782595	
Lifetime Savings - Present Value ($)	
Utility	$1,025,113
Community	$1,025,113
Lifetime Costs - Present Value ($)	
Utility	$34,410
Community	$42,041,374
Benefit to Cost Ratio	
Utility	29.79
Community	0.02
Cost of Savings per Unit Volume ($/mg)	
Utility	$3

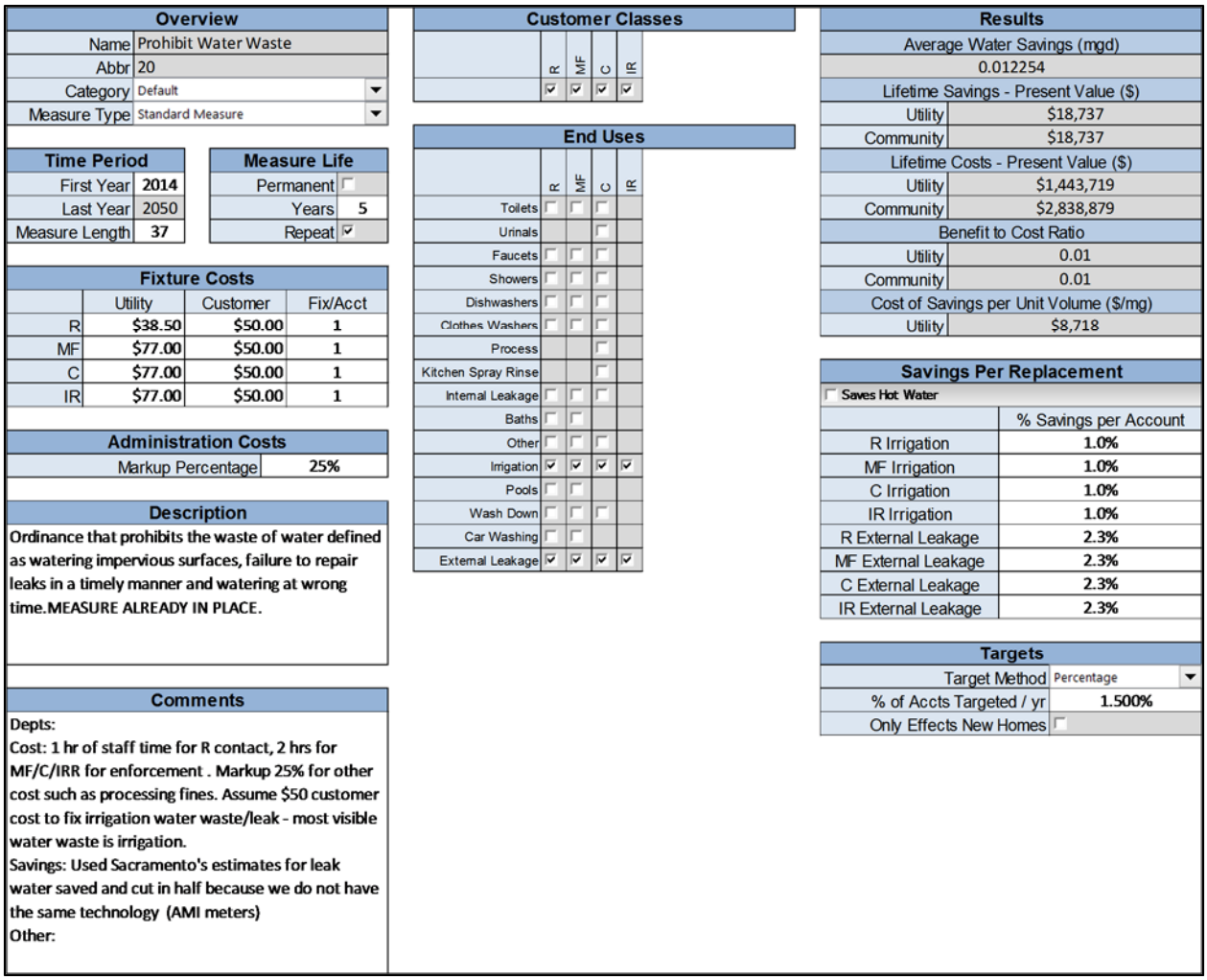
Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Irrigation	15.0%
MF Irrigation	10.0%
C Irrigation	10.0%
IR Irrigation	10.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	100.000%
Only Effects New Homes	☑

Water Management Plan (Prohibit Water Waste)



Overview	
Name	Prohibit Water Waste
Abbr	20
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2014
Last Year	2050
Measure Length	37

Measure Life	
Permanent	☐
Years	5
Repeat	☑

Fixture Costs	Utility	Customer	Fix/Acct
R	$38.50	$50.00	1
MF	$77.00	$50.00	1
C	$77.00	$50.00	1
IR	$77.00	$50.00	1

Administration Costs	
Markup Percentage	25%

Description

Ordinance that prohibits the waste of water defined as watering impervious surfaces, failure to repair leaks in a timely manner and watering at wrong time.MEASURE ALREADY IN PLACE.

Comments

Depts:
Cost: 1 hr of staff time for R contact, 2 hrs for MF/C/IRR for enforcement . Markup 25% for other cost such as processing fines. Assume $50 customer cost to fix irrigation water waste/leak - most visible water waste is irrigation.
Savings: Used Sacramento's estimates for leak water saved and cut in half because we do not have the same technology (AMI meters)
Other:

Customer Classes	R	MF	C	IR
	☑	☑	☑	☑

End Uses	R	MF	C	IR
Toilets	☐	☐	☐	
Urinals			☐	
Faucets	☐	☐	☐	
Showers	☐	☐	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☐	☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage	☐	☐	☐	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☑	☑	☑	☑
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☑	☑	☑	☑

Results	
Average Water Savings (mgd)	
0.012254	
Lifetime Savings - Present Value ($)	
Utility	$18,737
Community	$18,737
Lifetime Costs - Present Value ($)	
Utility	$1,443,719
Community	$2,838,879
Benefit to Cost Ratio	
Utility	0.01
Community	0.01
Cost of Savings per Unit Volume ($/mg)	
Utility	$8,718

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Irrigation	1.0%
MF Irrigation	1.0%
C Irrigation	1.0%
IR Irrigation	1.0%
R External Leakage	2.3%
MF External Leakage	2.3%
C External Leakage	2.3%
IR External Leakage	2.3%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.500%
Only Effects New Homes	☐

CII High Water Users (Top CII Users)

Overview	
Name	Top CII Users
Abbr	21
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2050
Measure Length	36

Measure Life	
Permanent	☐
Years	10
Repeat	☑

Fixture Costs	Utility	Customer	Fix/Acct
C	$2,500.00	$2,500.00	1

Administration Costs	
Markup Percentage	30%

Description

Top water customers from each category would be offered a free water survey that would evaluate ways for the business to save water and money. The surveys would be for large accounts (such as, accounts that use more than 5,000 gallons of water per day) such as hotels, restaurants, stores and schools. Emphasis will be on supporting the top 25 users for each customer category.

Comments

Depts:
Cost: Used CA's data
Savings: Increased typical 5% savings per top user water use to 30% to reflect that this measure targets users using 5-10 times average commercial water use. This accounts for top user water use reduction (versus savings percent of avg commercial use).
Other: Lowered target to 1% a year, focused on indoor water uses. Large Landscape audits are focused on outdoor uses.

Customer Classes

	R	MF	C	IR
	☐	☐	☑	☐

End Uses

	R	MF	C	IR
Toilets			☑	
Urinals			☑	
Faucets			☑	
Showers			☑	
Dishwashers			☑	
Clothes Washers			☑	
Process			☑	
Kitchen Spray Rinse			☑	
Internal Leakage			☑	
Baths				
Other			☑	
Irrigation			☐	
Pools				
Wash Down			☐	
Car Washing				
External Leakage			☐	

Results

Average Water Savings (mgd)	
0.097513	
Lifetime Savings - Present Value ($)	
Utility	$2,554,781
Community	$5,874,911
Lifetime Costs - Present Value ($)	
Utility	$1,962,453
Community	$3,472,032
Benefit to Cost Ratio	
Utility	1.30
Community	1.69
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,489

Savings Per Replacement

☑ Saves Hot Water

	% Savings per Account
C Toilets	30.0%
C Urinals	30.0%
C Faucets	30.0%
C Showers	30.0%
C Dishwashers	30.0%
C Clothes Washers	30.0%
C Process	30.0%
C Kitchen Spray Rinse	30.0%
C Internal Leakage	30.0%
C Other	30.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Homes	☐

Pre-rinse spray nozzles

Overview	
Name	Pre-Rinse Spray Nozzles
Abbr	22
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2034
Measure Length	20

Measure Life	
Permanent	☑

Fixture Costs			
	Utility	Customer	Fix/Acct
C	$83.50	$0.00	3

Administration Costs	
Markup Percentage	25%

Description

Provide free high efficiency spray nozzles and free installation for rinse and clean operations in restaurants and other commercial kitchens. Replacement will occur from going door to door, very cost-effective because saves hot water.

Comments

Depts:
Cost: 1 hr of staff time to change out + $45/fix (based on Niagara's 1.28 gpm)
Savings: Coversion between inefficient nozzle to 1.28.
Other: Food service and service technology center:
http://www.fishnick.com/equipment/sprayvalves/
Currently 40% of C class could have pre-rinse spray nozzles

Customer Classes	R	MF	C	IR
	☐	☐	☑	☐

End Uses	R	MF	C	IR
Toilets			☐	
Urinals			☐	
Faucets			☐	
Showers			☐	
Dishwashers			☐	
Clothes Washers			☐	
Process			☐	
Kitchen Spray Rinse			☑	
Internal Leakage			☐	
Baths				
Other			☐	
Irrigation			☐	
Pools				
Wash Down			☐	
Car Washing				
External Leakage			☐	

Results	
Average Water Savings (mgd)	
0.049261	
Lifetime Savings - Present Value ($)	
Utility	$1,189,883
Community	$5,051,124
Lifetime Costs - Present Value ($)	
Utility	$142,959
Community	$142,959
Benefit to Cost Ratio	
Utility	8.32
Community	35.33
Cost of Savings per Unit Volume ($/mg)	
Utility	$215

Savings Per Replacement	
☑ Saves Hot Water	
	% Savings per Account
C Kitchen Spray Rinse	50.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Homes	☐

School (Youth) Education

Overview	
Name	School Education
Abbr	23
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2014
Last Year	2050
Measure Length	37

Measure Life	
Permanent	☐
Years	2
Repeat	☑

Fixture Costs	Utility	Customer	Fix/Acct
R	$5.50		1
MF	$5.50		1

Administration Costs	
Markup Percentage	25%

Description

Work with local school districts to develop regularly utilized classroom programs including Youth Water Festival.
MEASURE ALREADY IN PLACE

Comments

Depts:
Cost: Cost is actual program cost per year divided by number of students.
Savings: Data from CA's research.
Other: 2013 had 13,000 students.

Customer Classes	R	MF	C	IR
	☑	☑	☐	☐

End Uses	R	MF	C	IR
Toilets	☑	☑		
Urinals				
Faucets	☑	☑		
Showers	☑	☑		
Dishwashers	☑	☑		
Clothes Washers	☑	☑		
Process				
chen Spray Rinse				
Internal Leakage	☑	☑		
Baths	☑	☑		
Other	☐	☐		
Irrigation	☑	☑		
Pools	☐	☐		
Wash Down	☑	☑		
Car Washing	☑	☑		
External Leakage	☑	☑		

Results	
Average Water Savings (mgd)	
0.067258	
Lifetime Savings - Present Value ($)	
Utility	$1,315,344
Community	$2,552,723
Lifetime Costs - Present Value ($)	
Utility	$1,785,817
Community	$1,785,817
Benefit to Cost Ratio	
Utility	0.74
Community	1.43
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,965

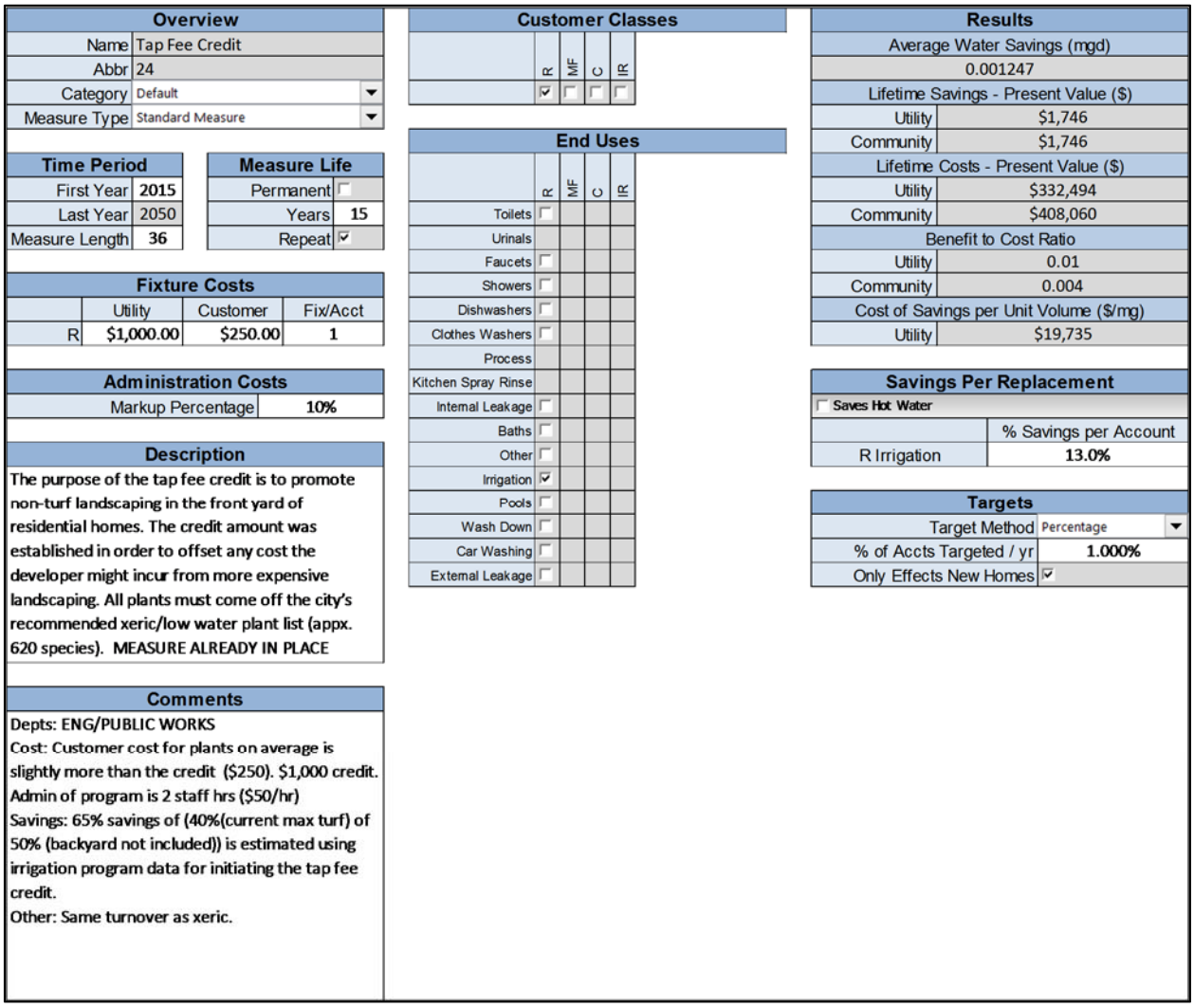
Savings Per Replacement

☑ Saves Hot Water

	% Savings per Account
R Toilets	1.0%
MF Toilets	1.0%
R Faucets	1.0%
MF Faucets	1.0%
R Showers	1.0%
MF Showers	1.0%
R Dishwashers	1.0%
MF Dishwashers	1.0%
R Clothes Washers	1.0%
MF Clothes Washers	1.0%
R Internal Leakage	1.0%
MF Internal Leakage	1.0%
R Baths	1.0%
MF Baths	1.0%
R Irrigation	1.0%
MF Irrigation	1.0%
R Wash Down	1.0%
MF Wash Down	1.0%
R Car Washing	1.0%
MF Car Washing	1.0%
R External Leakage	1.0%
MF External Leakage	1.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	15.000%
Only Effects New Homes	☐

Tap Fee Credit



Overview	
Name	Tap Fee Credit
Abbr	24
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2050
Measure Length	36

Measure Life	
Permanent	☐
Years	15
Repeat	☑

Fixture Costs	Utility	Customer	Fix/Acct
R	$1,000.00	$250.00	1

Administration Costs	
Markup Percentage	10%

Description

The purpose of the tap fee credit is to promote non-turf landscaping in the front yard of residential homes. The credit amount was established in order to offset any cost the developer might incur from more expensive landscaping. All plants must come off the city's recommended xeric/low water plant list (appx. 620 species). MEASURE ALREADY IN PLACE

Comments

Depts: ENG/PUBLIC WORKS
Cost: Customer cost for plants on average is slightly more than the credit ($250). $1,000 credit. Admin of program is 2 staff hrs ($50/hr)
Savings: 65% savings of (40%(current max turf) of 50% (backyard not included)) is estimated using irrigation program data for initiating the tap fee credit.
Other: Same turnover as xeric.

Customer Classes	R	MF	C	IR
	☑	☐	☐	☐

End Uses	R	MF	C	IR
Toilets	☐			
Urinals				
Faucets	☐			
Showers	☐			
Dishwashers	☐			
Clothes Washers	☐			
Process				
Kitchen Spray Rinse				
Internal Leakage	☐			
Baths	☐			
Other	☐			
Irrigation	☑			
Pools	☐			
Wash Down	☐			
Car Washing	☐			
External Leakage	☐			

Results	
Average Water Savings (mgd)	
0.001247	
Lifetime Savings - Present Value ($)	
Utility	$1,746
Community	$1,746
Lifetime Costs - Present Value ($)	
Utility	$332,494
Community	$408,060
Benefit to Cost Ratio	
Utility	0.01
Community	0.004
Cost of Savings per Unit Volume ($/mg)	
Utility	$19,735

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Irrigation	13.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	1.000%
Only Effects New Homes	☑

Z Zones (Zero Water Use Zones)

Overview	
Name	Z Zones
Abbr	25
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2015
Last Year	2051
Measure Length	37

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
MF	$577.50		1
C	$577.50		1
IR	$577.50		1

Administration Costs	
Markup Percentage	13%

Description

The purpose of z-zones is to allow for a temporary watering allocation to establish a native landscape. These z-zones will not require long-term water use and will be allowed for a zero cost per square foot tap fee to developers. An administrative fee will be assessed for installation of the temporary tap. This will allow for an upfront savings for developers and will encourage them to install water conserving landscapes in common areas watered by irrigation meters.
MEASURE ALREADY IN PLACE

Comments

Depts: ENG/PLANNING/CONSERVATION
Cost: 17 hours of staff time per meter.
Savings: Savings reflects going from low water to no water use in 53% of the property. 15% of new properties are participating now but will be higher in future.
Other:

Customer Classes	R	MF	C	IR
	☐	☑	☑	☑

End Uses	R	MF	C	IR
Toilets		☐	☐	
Urinals			☐	
Faucets		☐	☐	
Showers		☐	☐	
Dishwashers		☐	☐	
Clothes Washers		☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage		☐	☐	
Baths		☐		
Other		☐	☐	
Irrigation		☑	☑	☑
Pools		☐		
Wash Down		☐	☐	
Car Washing		☐		
External Leakage		☑	☑	☑

Results	
Average Water Savings (mgd)	
0.290171	
Lifetime Savings - Present Value ($)	
Utility	$373,179
Community	$373,179
Lifetime Costs - Present Value ($)	
Utility	$458,242
Community	$458,242
Benefit to Cost Ratio	
Utility	0.81
Community	0.81
Cost of Savings per Unit Volume ($/mg)	
Utility	$117

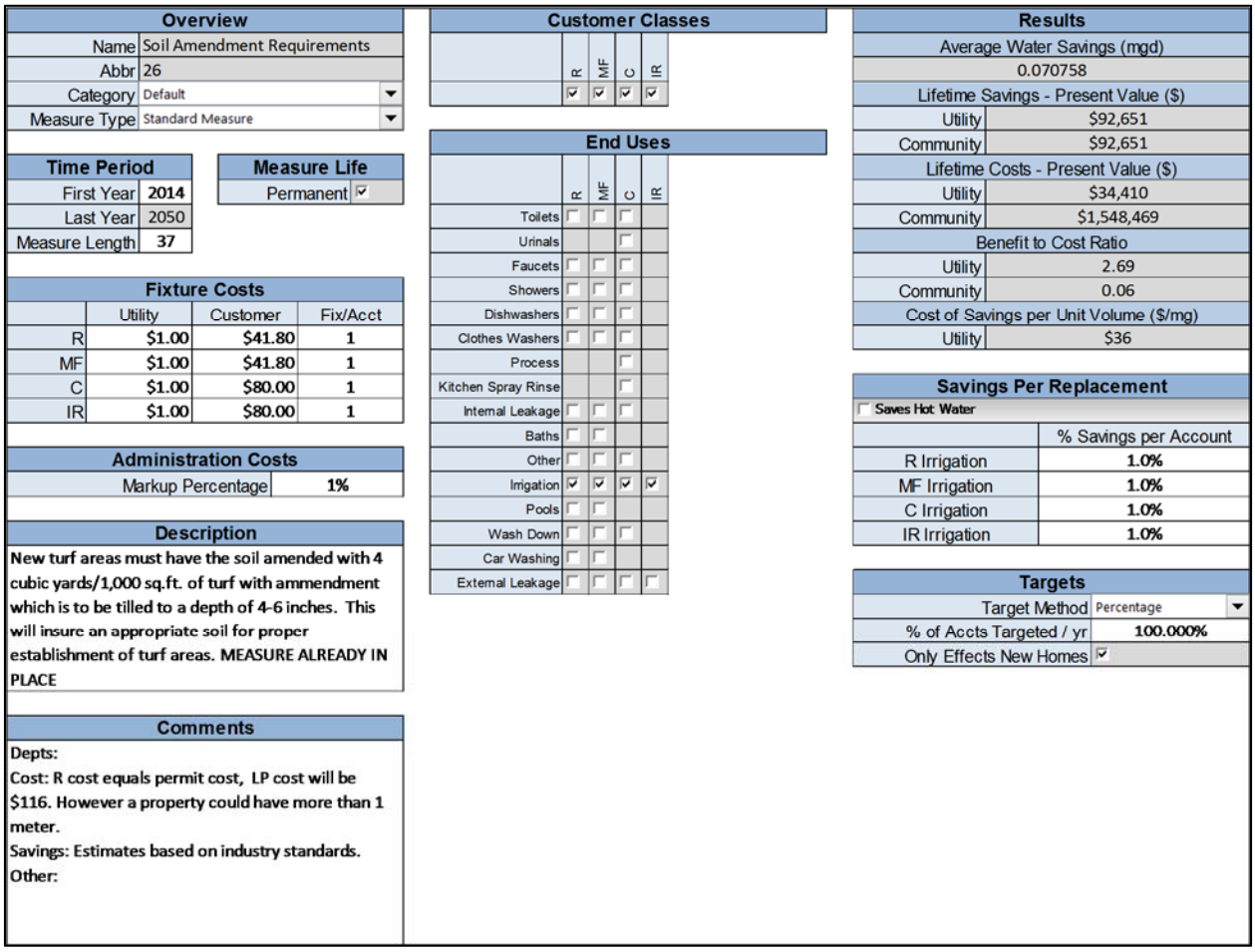
Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
MF Irrigation	25.0%
C Irrigation	25.0%
IR Irrigation	25.0%
MF External Leakage	53.0%
C External Leakage	53.0%
IR External Leakage	53.0%

Targets	
Target Method	Percentage
% of Accts Targeted / yr	20.000%
Only Effects New Homes	☑

Soil Amendment Requirement



Overview

Name	Soil Amendment Requirements
Abbr	26
Category	Default
Measure Type	Standard Measure

Time Period

First Year	2014
Last Year	2050
Measure Length	37

Measure Life

Permanent ☑

Fixture Costs

	Utility	Customer	Fix/Acct
R	$1.00	$41.80	1
MF	$1.00	$41.80	1
C	$1.00	$80.00	1
IR	$1.00	$80.00	1

Administration Costs

Markup Percentage	1%

Description

New turf areas must have the soil amended with 4 cubic yards/1,000 sq.ft. of turf with ammendment which is to be tilled to a depth of 4-6 inches. This will insure an appropriate soil for proper establishment of turf areas. MEASURE ALREADY IN PLACE

Comments

Depts:
Cost: R cost equals permit cost, LP cost will be $116. However a property could have more than 1 meter.
Savings: Estimates based on industry standards.
Other:

Customer Classes

	R	MF	C	IR
	☑	☑	☑	☑

End Uses

	R	MF	C	IR
Toilets	☐	☐	☐	
Urinals			☐	
Faucets	☐	☐	☐	
Showers	☐	☐	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☐	☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage	☐	☐	☐	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☑	☑	☑	☑
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☐	☐	☐	☐

Results

Average Water Savings (mgd)	
	0.070758
Lifetime Savings - Present Value ($)	
Utility	$92,651
Community	$92,651
Lifetime Costs - Present Value ($)	
Utility	$34,410
Community	$1,548,469
Benefit to Cost Ratio	
Utility	2.69
Community	0.06
Cost of Savings per Unit Volume ($/mg)	
Utility	$36

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Irrigation	1.0%
MF Irrigation	1.0%
C Irrigation	1.0%
IR Irrigation	1.0%

Targets

Target Method	Percentage
% of Accts Targeted / yr	100.000%
Only Effects New Homes	☑

UHET (Ultra High Efficiency Toilets) Only Rebates

Overview	
Name	UHET Only Rebates
Abbr	28
Category	Default
Measure Type	Standard Measure

Time Period	
First Year	2014
Last Year	2020
Measure Length	7

Measure Life	
Permanent	☑

Fixture Costs	Utility	Customer	Fix/Acct
R	$150.00	$100.00	2
MF	$150.00	$20.00	10
C	$150.00	$20.00	5

Administration Costs	
Markup Percentage	26%

Description

Provide a rebate for the installation of a ultra high efficiency toilets (UHET) that replaces a toilet flushing over 3.5 gpf. Toilets flushing 1.0 gpf or less and WaterSense labeled. Rebate amount are up to $150/toilet and up to 2 toilets/unit.

Comments

Depts:
Cost: $150 rebate. Customer cost due to average spending over the rebate amount including installation.
Savings: 36% savings per toilets replaced. 50% + Increase in efficiency, but not all toilets in unit are replaced.
Other:

Customer Classes	R	MF	C	IR
	☑	☑	☑	☐

End Uses	R	MF	C	IR
Toilets	☑	☑	☑	
Urinals			☐	
Faucets	☐	☐	☐	
Showers	☐	☐	☐	
Dishwashers	☐	☐	☐	
Clothes Washers	☐	☐	☐	
Process			☐	
Kitchen Spray Rinse			☐	
Internal Leakage	☐	☐	☐	
Baths	☐	☐		
Other	☐	☐	☐	
Irrigation	☐	☐	☐	
Pools	☐	☐		
Wash Down	☐	☐	☐	
Car Washing	☐	☐		
External Leakage	☐	☐	☐	

Results	
Average Water Savings (mgd)	
0.087836	
Lifetime Savings - Present Value ($)	
Utility	$2,467,285
Community	$2,467,285
Lifetime Costs - Present Value ($)	
Utility	$1,871,374
Community	$2,661,093
Benefit to Cost Ratio	
Utility	1.32
Community	0.93
Cost of Savings per Unit Volume ($/mg)	
Utility	$1,577

Savings Per Replacement

☐ Saves Hot Water

	% Savings per Account
R Toilets	36.0%
MF Toilets	36.0%
C Toilets	36.0%

Targets	
Target Method	
% of Accts Targeted / yr	1.000%
Only Effects New Homes	☐

Appendix G: Conservation Measure Implementation Plan

Activities and coordination necessary to implement the water efficiency measures selected (Section 4) are listed below in four tables.

Asterisks denote the following:

* Planned program. Planned programs are not official and can be delayed, cancelled or not implemented due to research, budget, policy, etc.
** Program not included in DSS model analysis.
*** These programs are a combination of the efforts of several divisions and departments. Therefore, the cost is estimated using staff time approximations and an average staff cost. This data is subject to change.

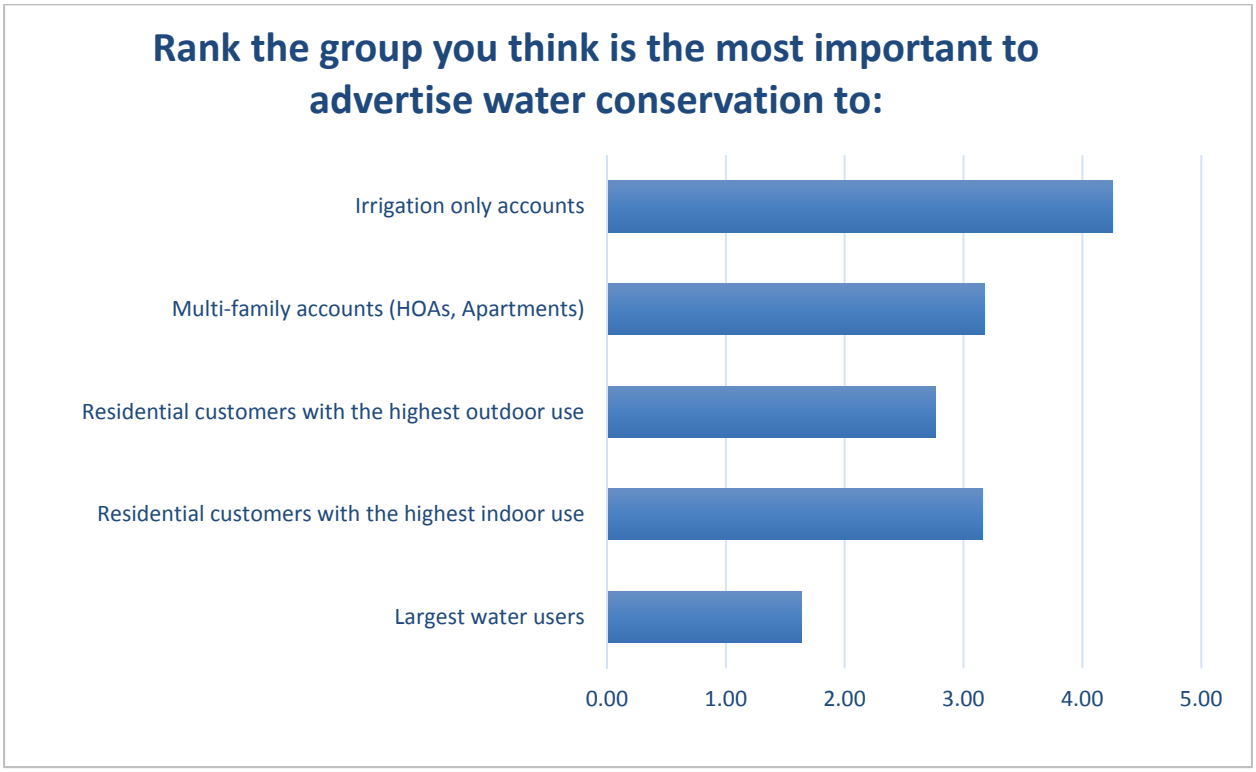
Selected Water Efficiency Activities	Period of Implementation	Implementation Actions	Milestone Deadlines	Annual Budget ($1,000)	Responsible for Implementation
Foundational Activities					
AMI and Leak Notice*	2019-2025	Marketing, Education	2019 - Start 2025 - 100% of meters are AMI	2623	T&D/Billing/Public Relations***
Water Budget Based Billing*	2021-2040	Marketing, Education	2015 - Research 2016 - Irrigation and commercial property pilot 2018 - All irrigation and commercial accounts 2021 - All residential and multi-family accounts	257	Public Relations/ Conservation***
Z-Zones	2014-2040	Marketing to developers	2014 - Start	28	Engineering/ Planning Department/ Conservation***
Single-family Tap Fee Credit	2015-2040	Marketing to developers	2014 - Start	15	Engineering/ Public Works***
Water Loss Measure	2014-2040	Ongoing	Annual M36 reporting	213	T&D/ Engineering***

Selected Water Efficiency Activities	Period of Implementation	Implementation Actions	Milestone Deadlines	Annual Budget ($1,000)	Responsible for Implementation
Targeted Technical Assistance and Incentives					
Single-family Indoor Water Audits	2014-2040	Marketing, Top User Notification	Annual Evaluation	23	Conservation
Multi-family Indoor Water Audits	2014-2040	Targeted Letters, Face to Face	Annual Evaluation		Conservation
Single-family Leak Repair Assistance	2014-2040	Case by Case	Annual Evaluation	53	Billing***
Government Building Fixtures*	2015-2019	Scheduling	2015 - Planning 2015 - Start 2017 - 50% complete	32	Conservation
Irrigation Audits	2014-2040	Marketing, Top User Notification	Annual Evaluation	63	Conservation
Single-family Xeriscape Rebate	2014-2040	Marketing	Annual Evaluation	116	Conservation
Large Property Xeriscape Rebate	2014-2040	Marketing	Annual Evaluation	12	Conservation
Smart Irrigation Controller Rebate*	2017-2040	Research, Marketing	2015 - Pilot 2017 - Start	74	Conservation
Rain Sensor Only Rebate*	2015-2024	Marketing	2015 - Start	3	Conservation
Irrigation Rebate	2014-2040	Marketing	Annual Evaluation	12	Conservation
CII High Water Users*	2015-2040	Face to Face, Cold Calls, Targeted Letters	2014 - Research 2015 - Start	108	Conservation
Pre-rinse Spray Nozzles*	2015-2034	Face to Face	2014 - Pilot 2015 - Start		Conservation
High Efficiency Urinal Rebate*	2016-2025	Marketing, Face to Face	2015 - Pilot 2016 - Start		Conservation
Ultra High Efficiency Toilet Rebates (≤1.0)	2014-2020	Marketing	2016 - UHET only	275	Conservation
Car Wash Certification**	2014-2040	Marketing, Periodic Visits	Annual Evaluation	1	Conservation
Low-Income Water Efficiency Program**	2014-2020	Marketing	Annual Evaluation	50	Conservation
Water Variance Program **	2014-2025	Marketing	Annual Evaluation	2	Conservation
Water Smart Reader Rental**	2014-2025	Marketing	Annual Evaluation	0.2	Conservation

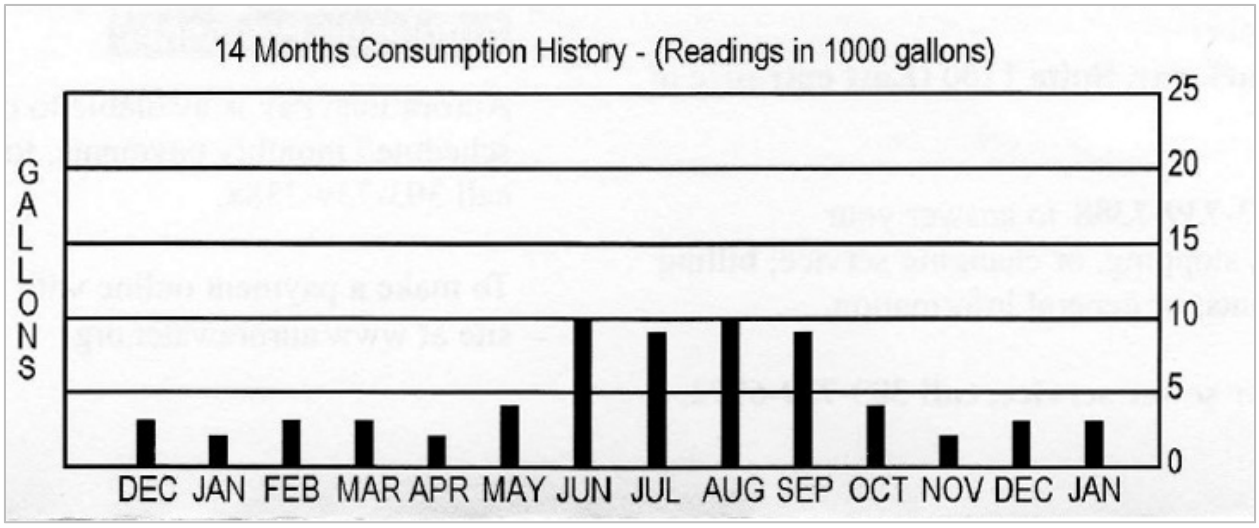
Selected Water Efficiency Activities	Period of Implementation	Implementation Actions	Milestone Deadlines	Annual Budget ($1,000)	Responsible for Implementation
Ordinances and Regulations					
Rain Sensor Ordinance	2014-2040	Website Posting, Code	Annual Evaluation	0	Conservation
Water Conserving Landscape Code	2014-2040	Website Posting, Code	Annual Evaluation	0	Conservation
Water Management Plan	2014-2040	Website Posting, Postcards, Code	Annual Evaluation	74	Conservation
Soil Amendment Ordinance	2014-2040	Website Posting, Marketing, Code	Annual Evaluation	74	Conservation
Irrigation Permit**	2014-2040		2015 - Attach to CO (Certificate of Occupancy)		Conservation
Irrigation Plans Review**	2014-2040	Website Posting, Code	Annual Evaluation	19	Conservation

Selected Water Efficiency Activities	Period of Implementation	Implementation Actions	Milestone Deadlines	Annual Budget ($1,000)	Responsible for Implementation
Education Activities					
School (Youth) Education	2014-2040	Marketing	Annual Evaluation	39	Conservation
Excellence in Xeriscape Award**	2014-2040	Increased Marketing	Annual Evaluation	2	Conservation
Forest to Faucets **	2014-2040	Marketing	Annual Evaluation	16	Conservation
Adult Education **	2014-2040	Marketing	Annual Evaluation	6	Conservation
Xeriscape Demonstration Garden**	2014-2040	Marketing, Increase Web Tools	Annual Evaluation	44	Conservation
Xeriscape Volunteer Program**	2014-2040	Marketing, Appreciation Events	Annual Evaluation	5	Conservation
Online Conservation Calculator**	2014-2040	Marketing, Tool Revamp, Integrated into Rebate Programs	2015 - Redesign 2016 - Unveil to Public and Attach to Rebates	5	Conservation
1-on-1 Landscape Design Consultations**	2014-2040	Marketing, Intern Training	Annual Evaluation	9	Conservation
H20 Outdoors**	2014-2040	Marketing, Continue Partnership	Annual Evaluation	6	Conservation
Community Gardens Program**	2014-2040	Marketing, Semi-Annual Meetings, Partnership Development	Annual Evaluation	4	Conservation
Water-Smart Landscape Contractor Training**	2014-2040	Marketing	Annual Evaluation	1	Conservation
H20 Tracker Smartphone App**	2014-2040	Marketing, Updates	Annual Evaluation	11	Conservation
Youth Water Festival**	2014-2040	Marketing, Maintain and Grow Partnerships	Annual Evaluation	31	Conservation

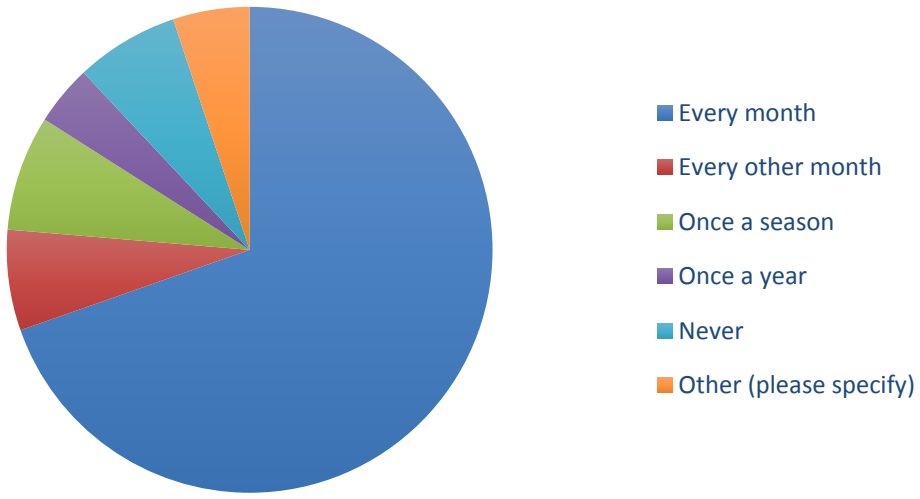
Appendix H: Public Input Survey



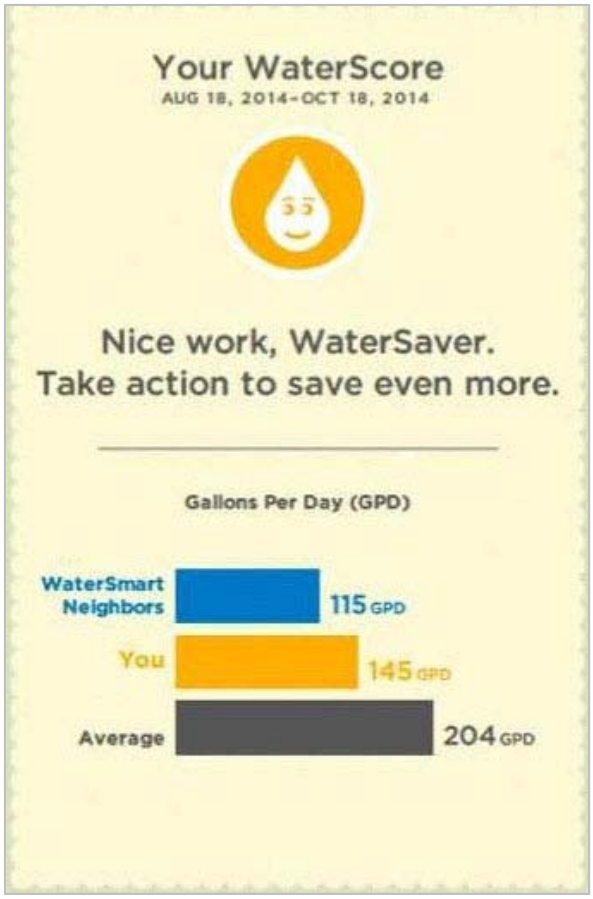
Answered: 1,408 Skipped: 0 Other: N/A

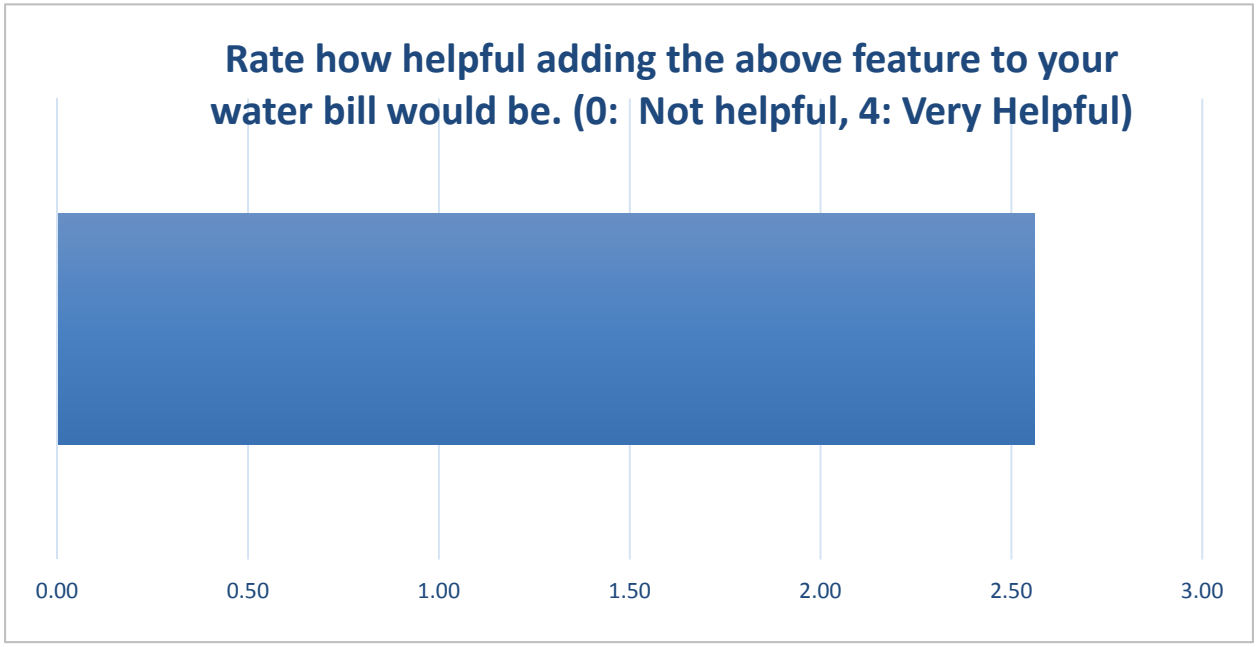


The above is an example of Aurora's current water bill.
How often do you analyze your water use?

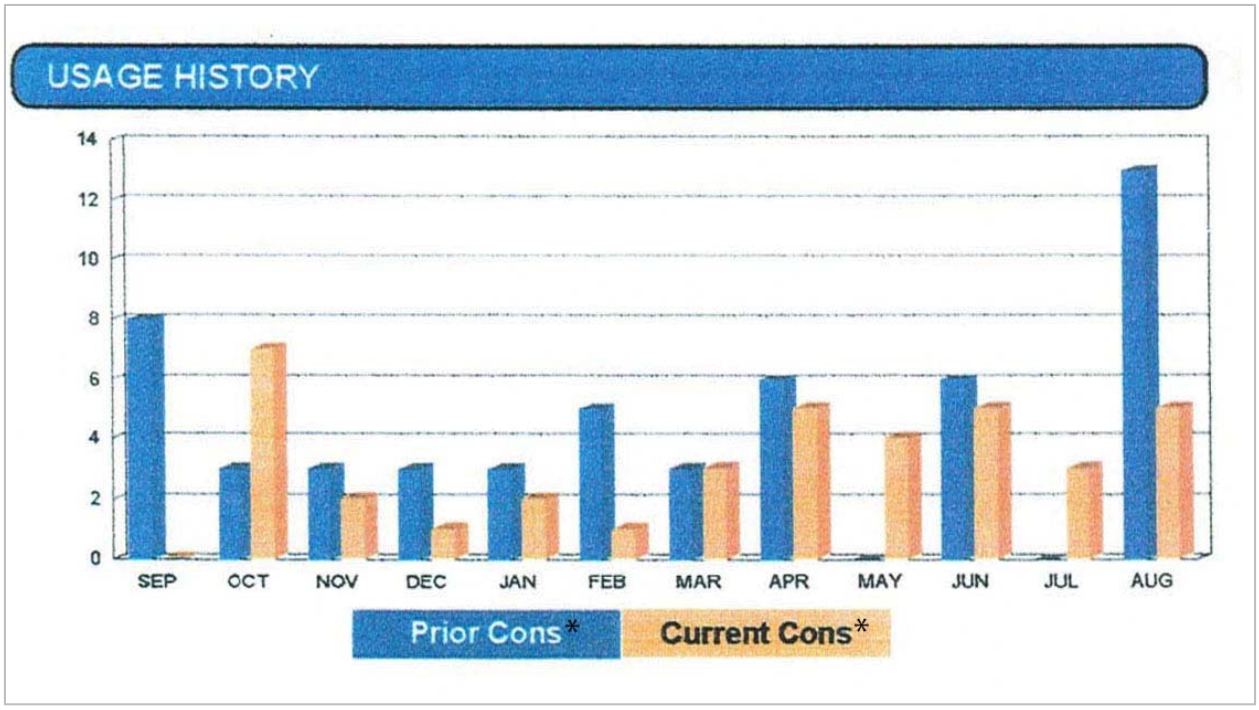


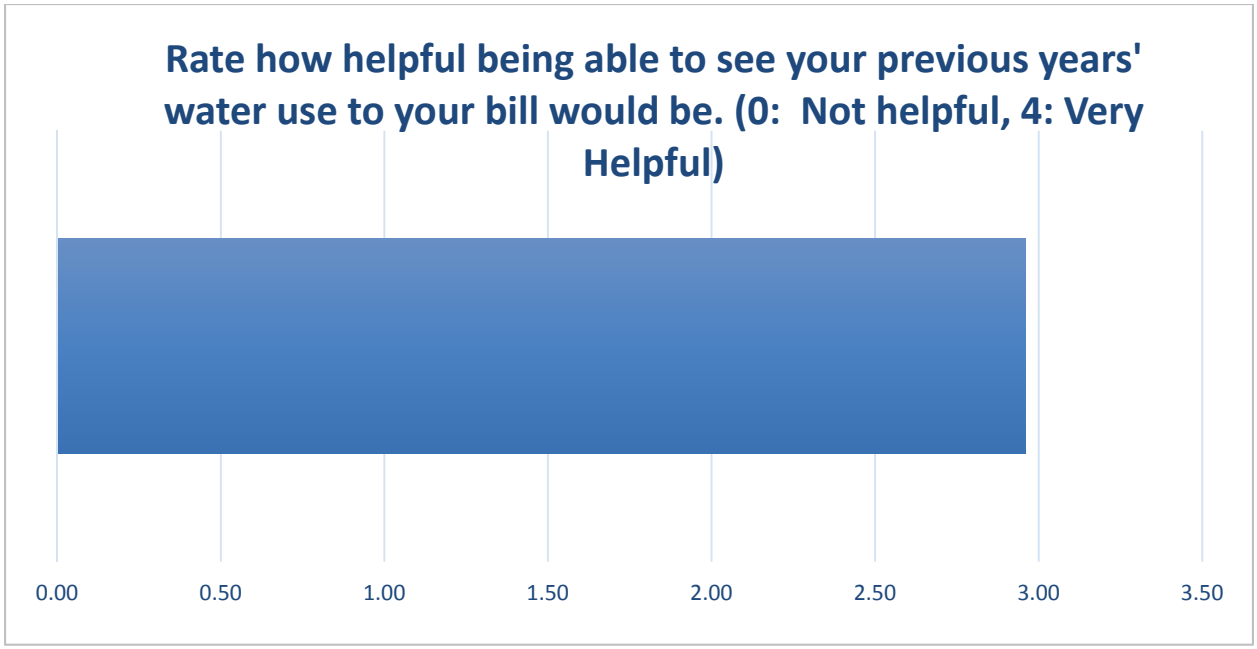
Answered: 1,386 Skipped: 22 Other: 70



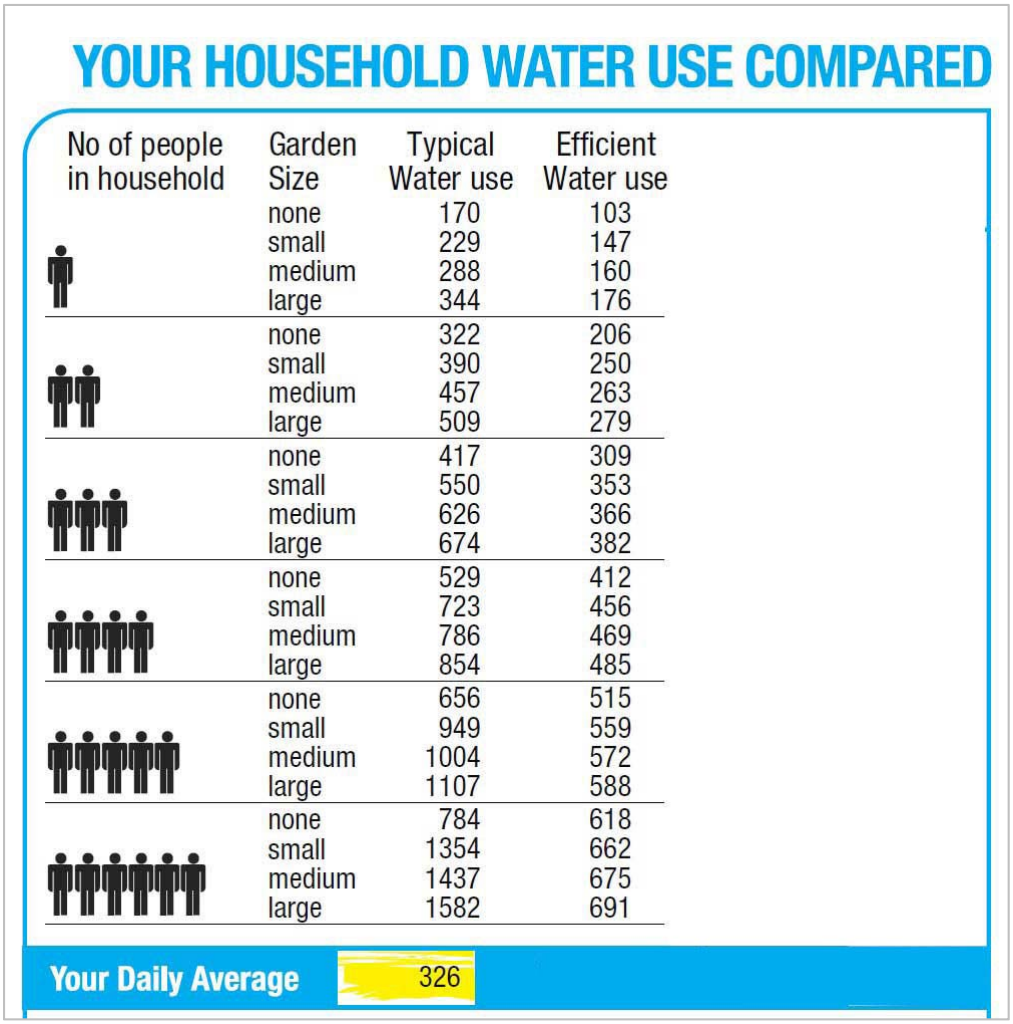


Answered: 1,371 Skipped: 37 Other: N/A





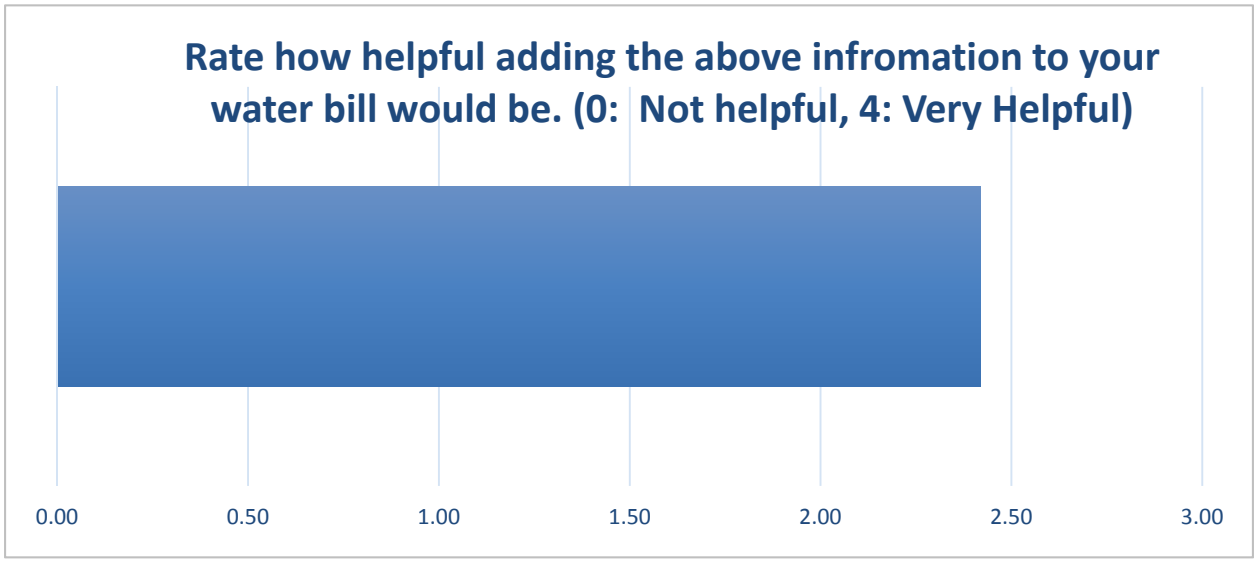
Answered: 1,363 Skipped: 45 Other: N/A



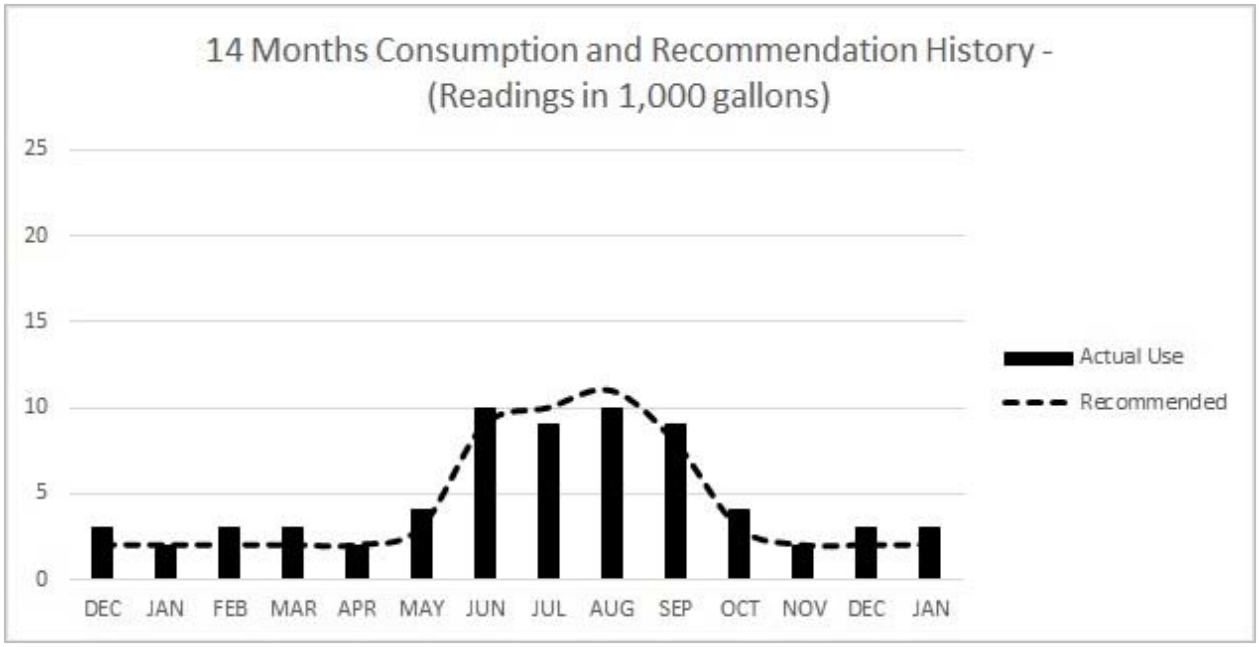
YOUR HOUSEHOLD WATER USE COMPARED

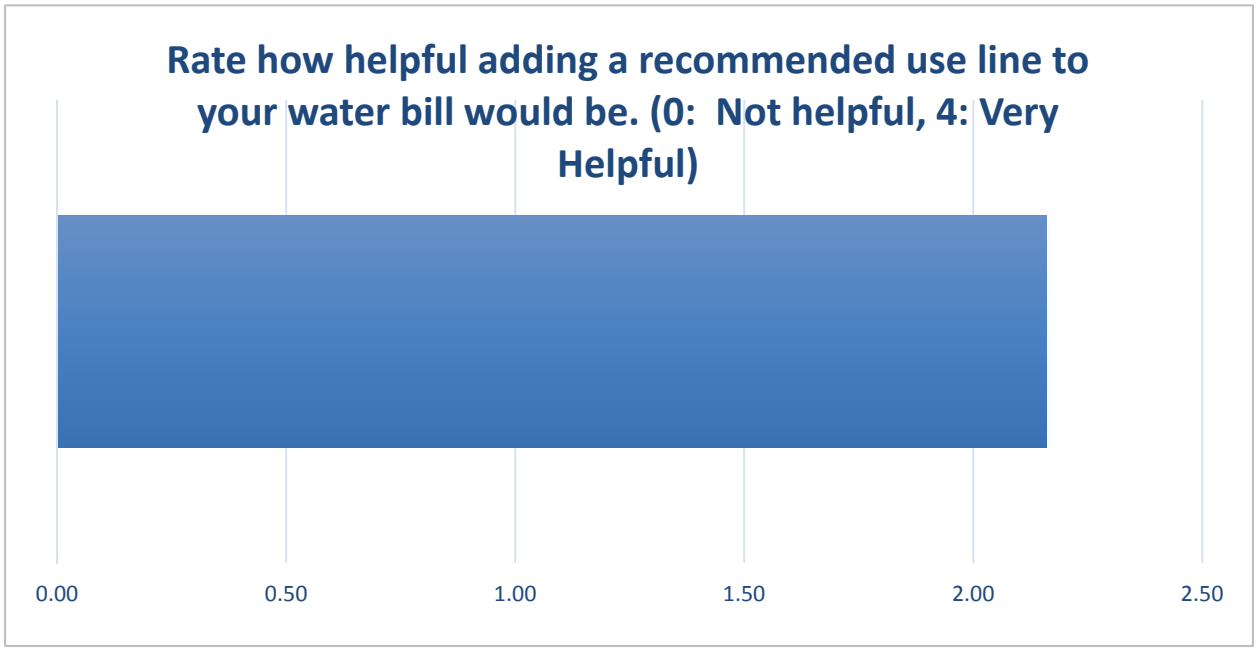
No of people in household	Garden Size	Typical Water use	Efficient Water use
1	none	170	103
	small	229	147
	medium	288	160
	large	344	176
2	none	322	206
	small	390	250
	medium	457	263
	large	509	279
3	none	417	309
	small	550	353
	medium	626	366
	large	674	382
4	none	529	412
	small	723	456
	medium	786	469
	large	854	485
5	none	656	515
	small	949	559
	medium	1004	572
	large	1107	588
6	none	784	618
	small	1354	662
	medium	1437	675
	large	1582	691

Your Daily Average 326

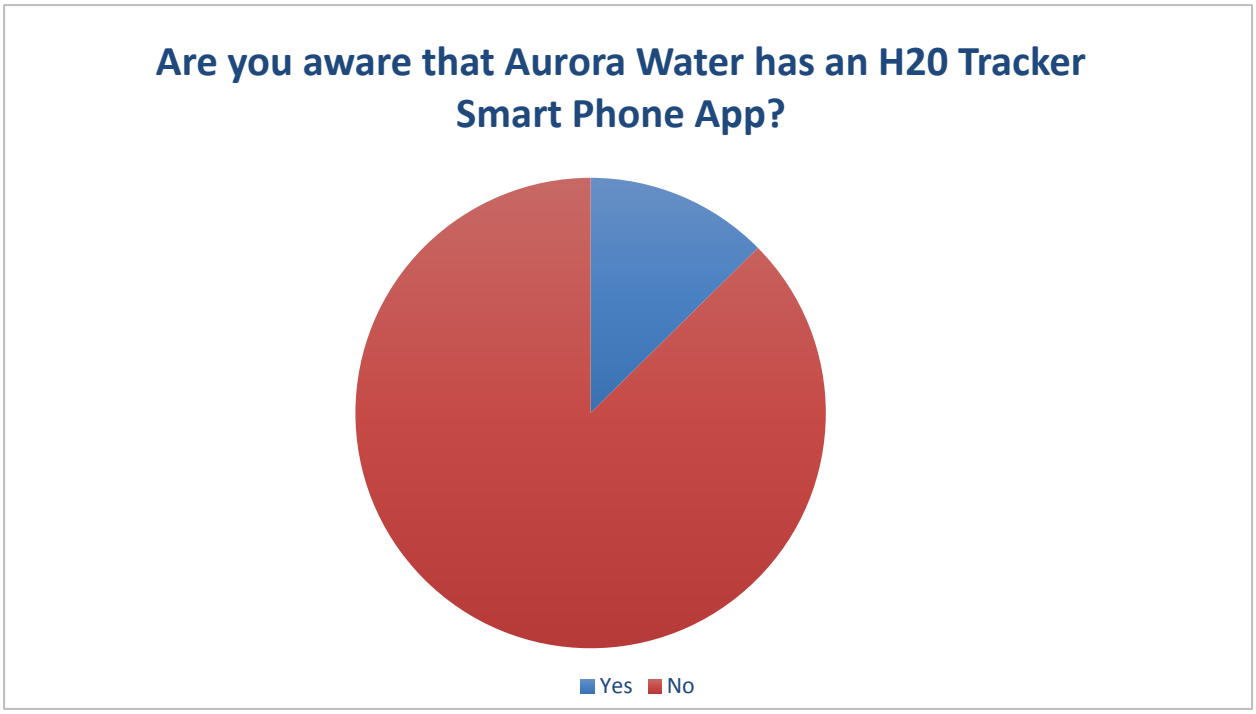


Answered: 1,358 Skipped: 50 Other: N/A





Answered: 1,352 Skipped: 56 Other: N/A



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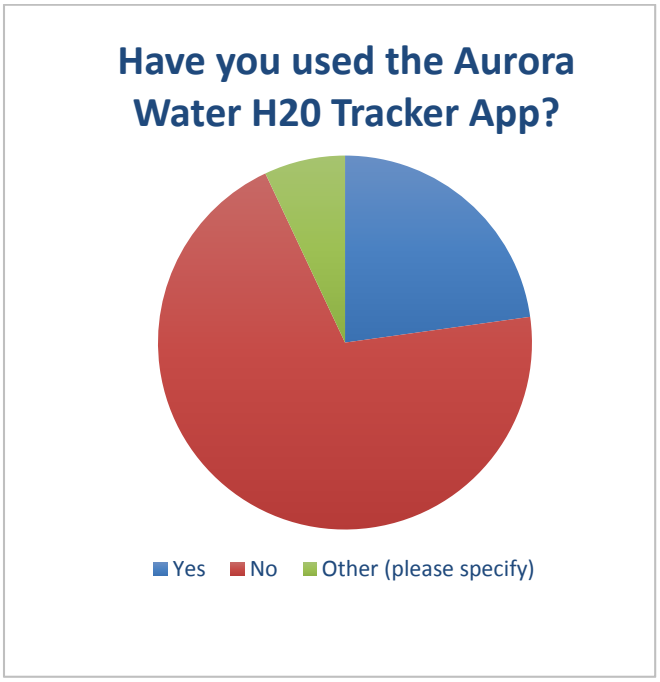
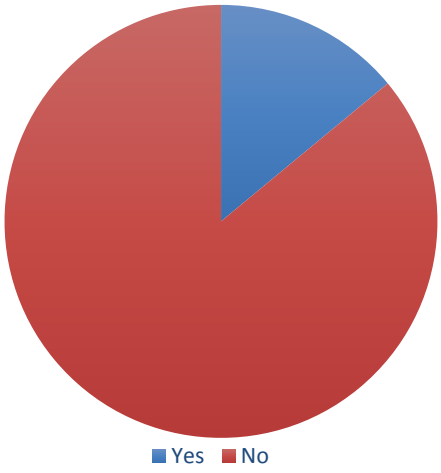


Only seen by those who answered yes to the previous question.

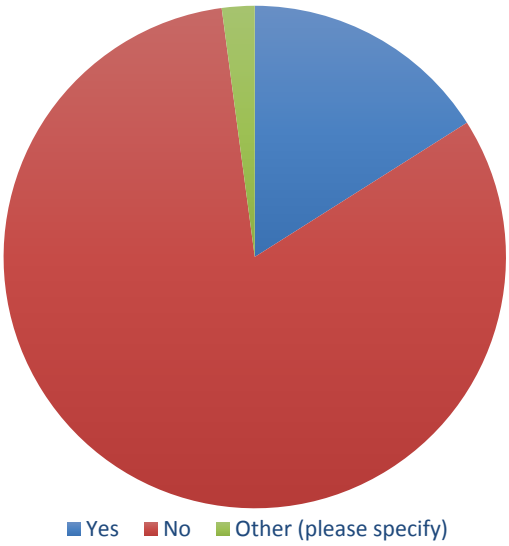
Answered: 171 Skipped: 1,237 Other: 12

Are you aware that Aurora Water has an Online Water Conservation Calculator? The calculator will help you analyze your current water use, your conservation potential, and provide you with a long term plan to meet your conservation goals.



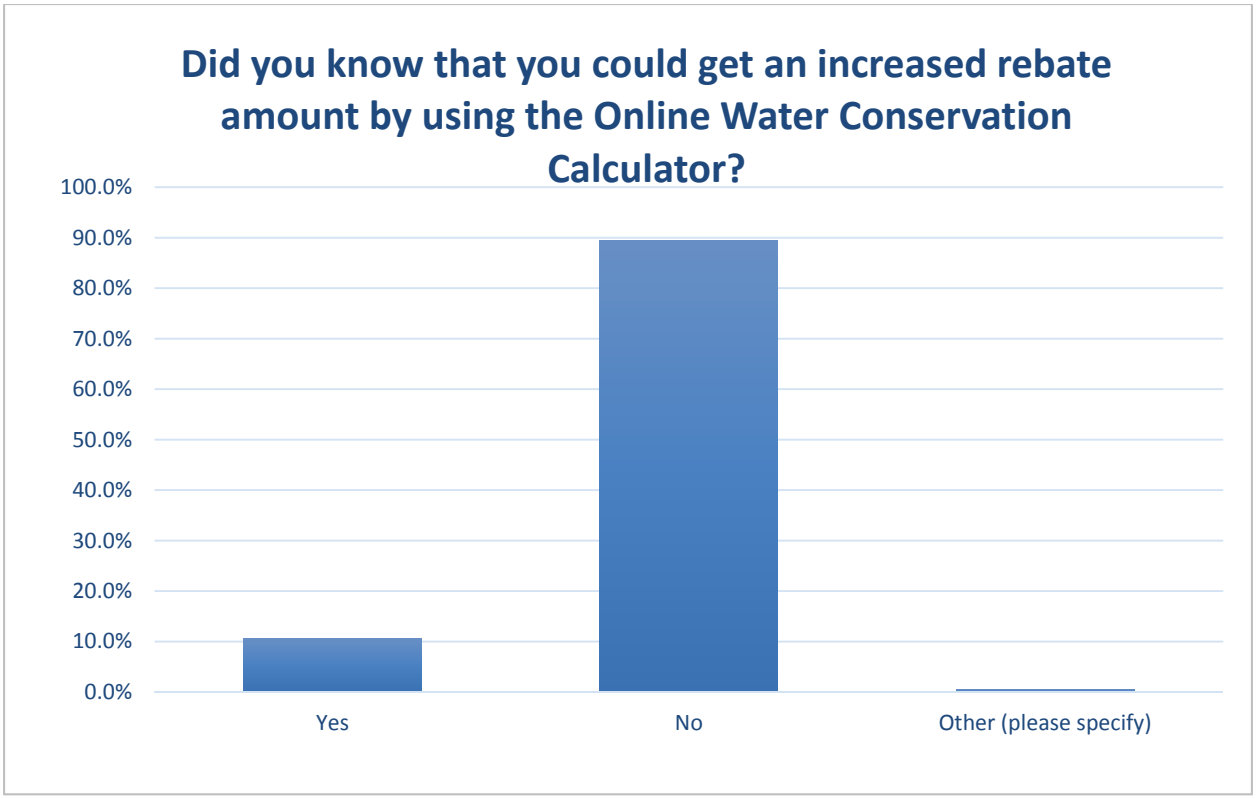
Answered: 1,350 Skipped: 58 Other: N/A

Have you used the Online Water Conservation Calculator?



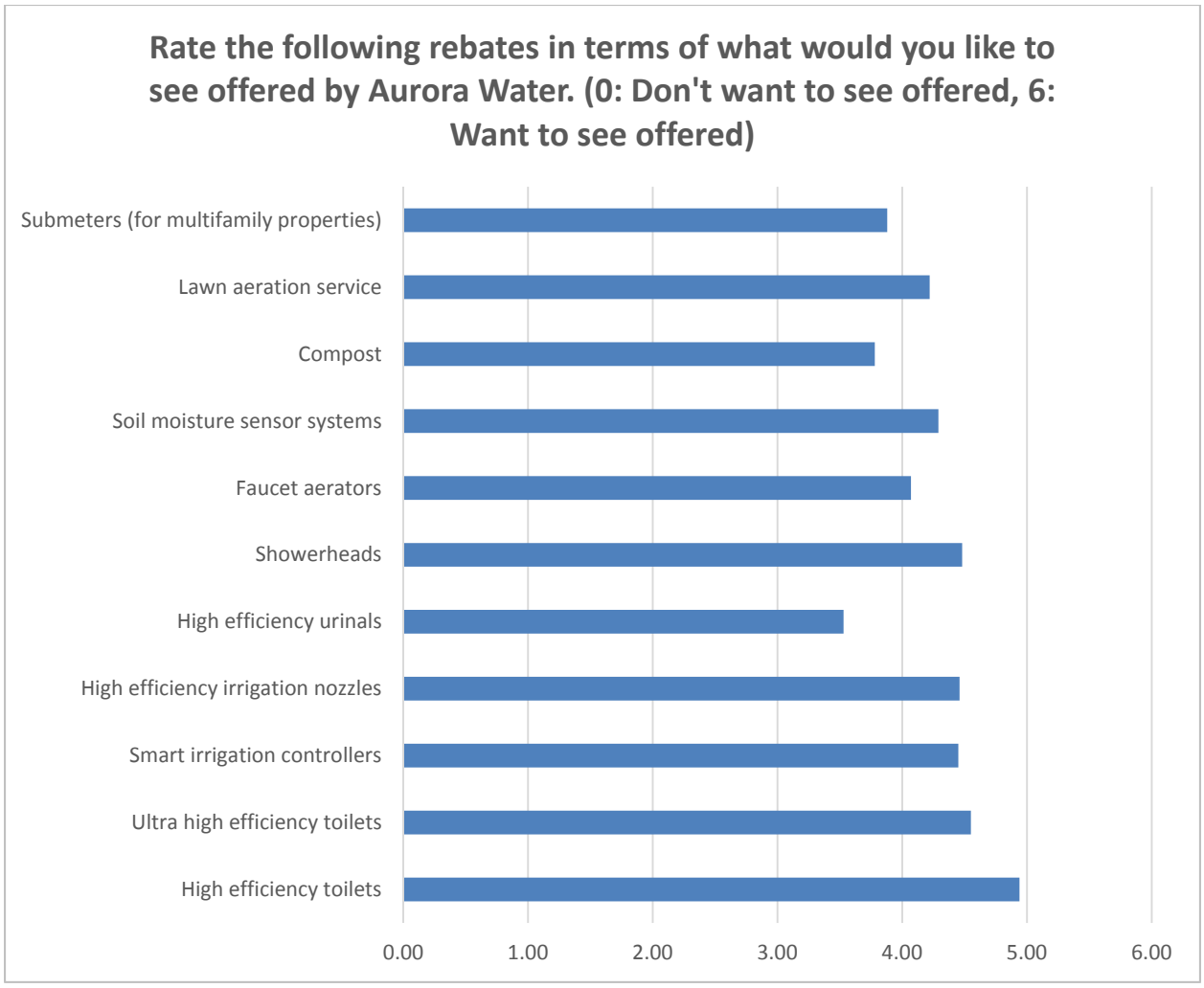
Only seen by those who answered yes to the previous question.

Answered: 187 Skipped: 1,221 Other: 4

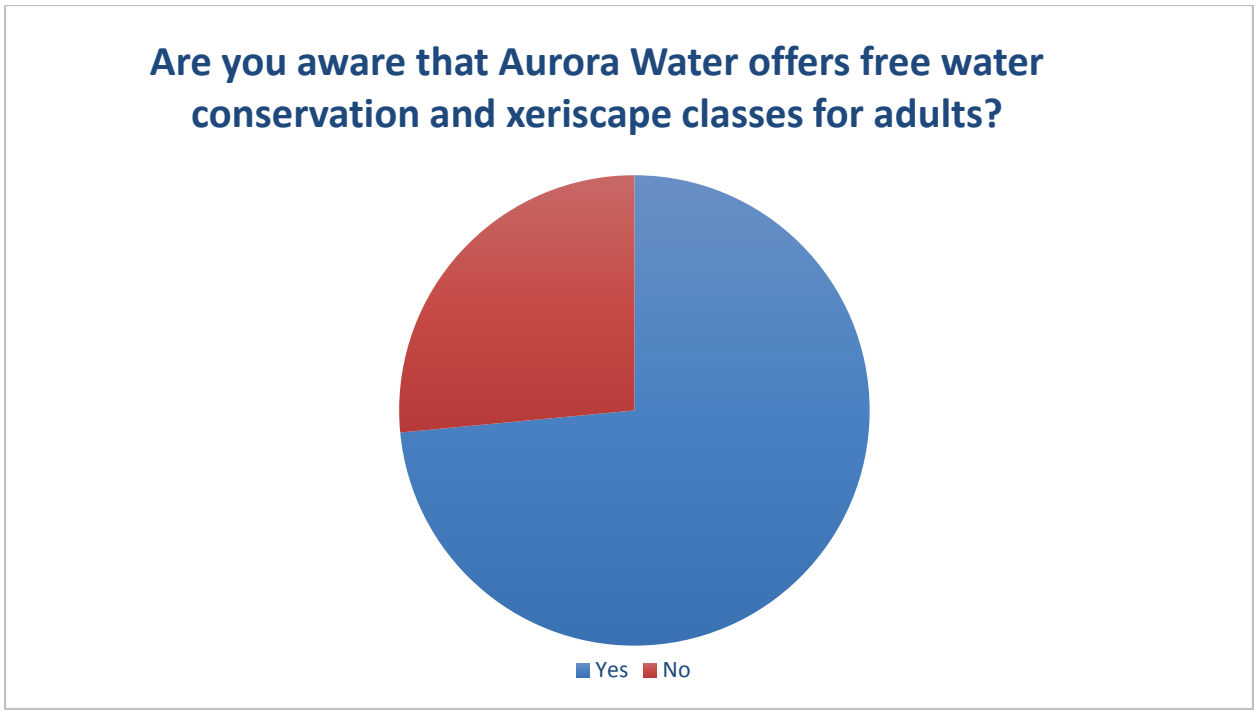


Only seen by those who answered yes to the “Are you aware that Aurora Water has an Online Water Conservation Calculator?” question.

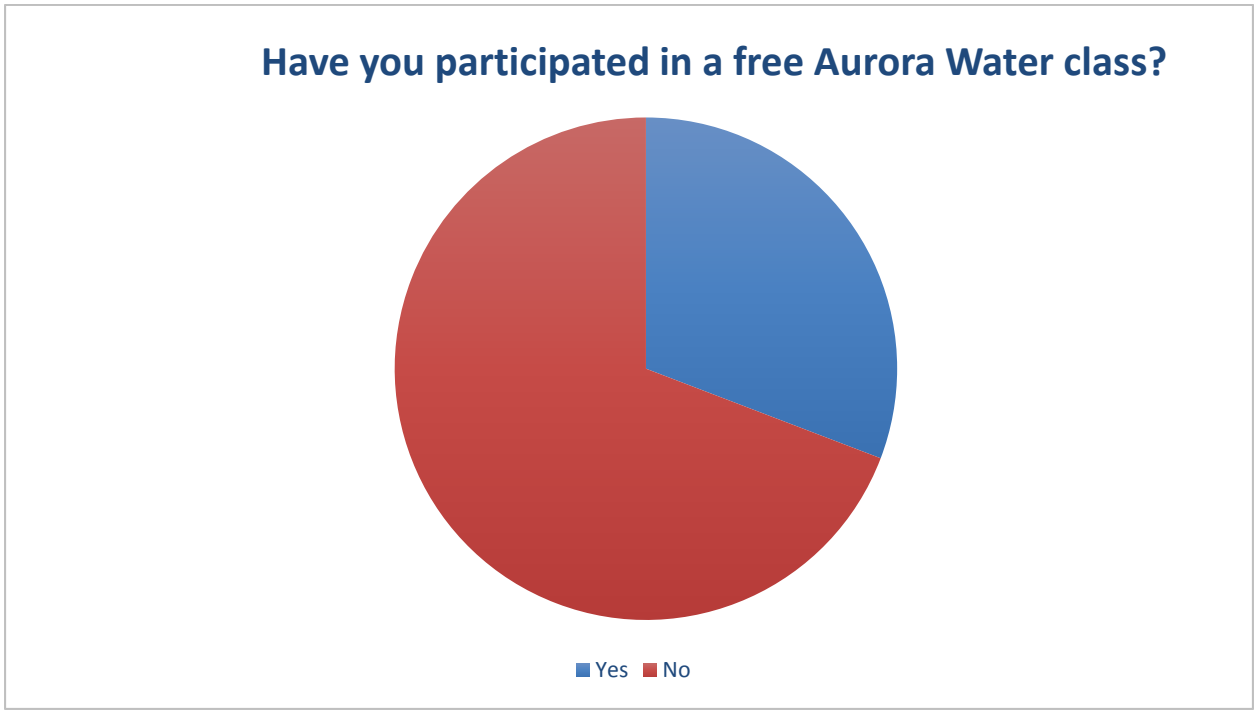
Answered: 188 Skipped: 1,220 Other: 1



Answered: 1,331 Skipped: 77 Other: 109

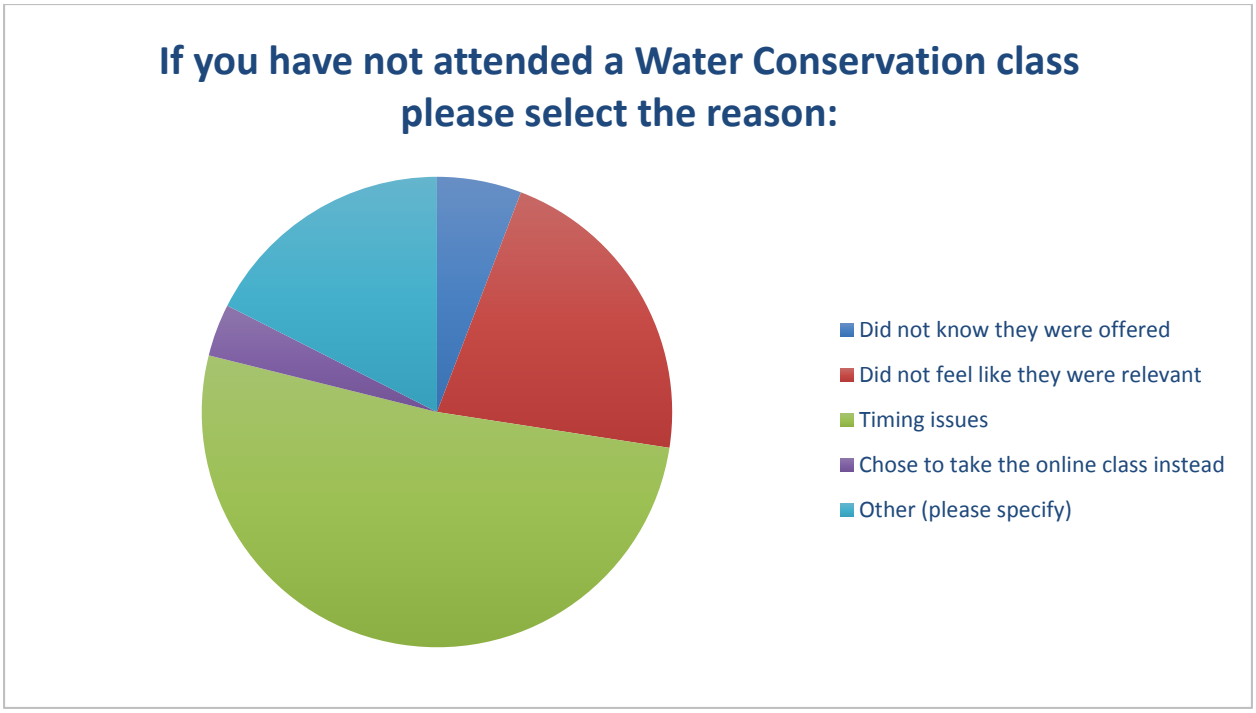


Answered: 1,330 Skipped: 78 Other: N/A



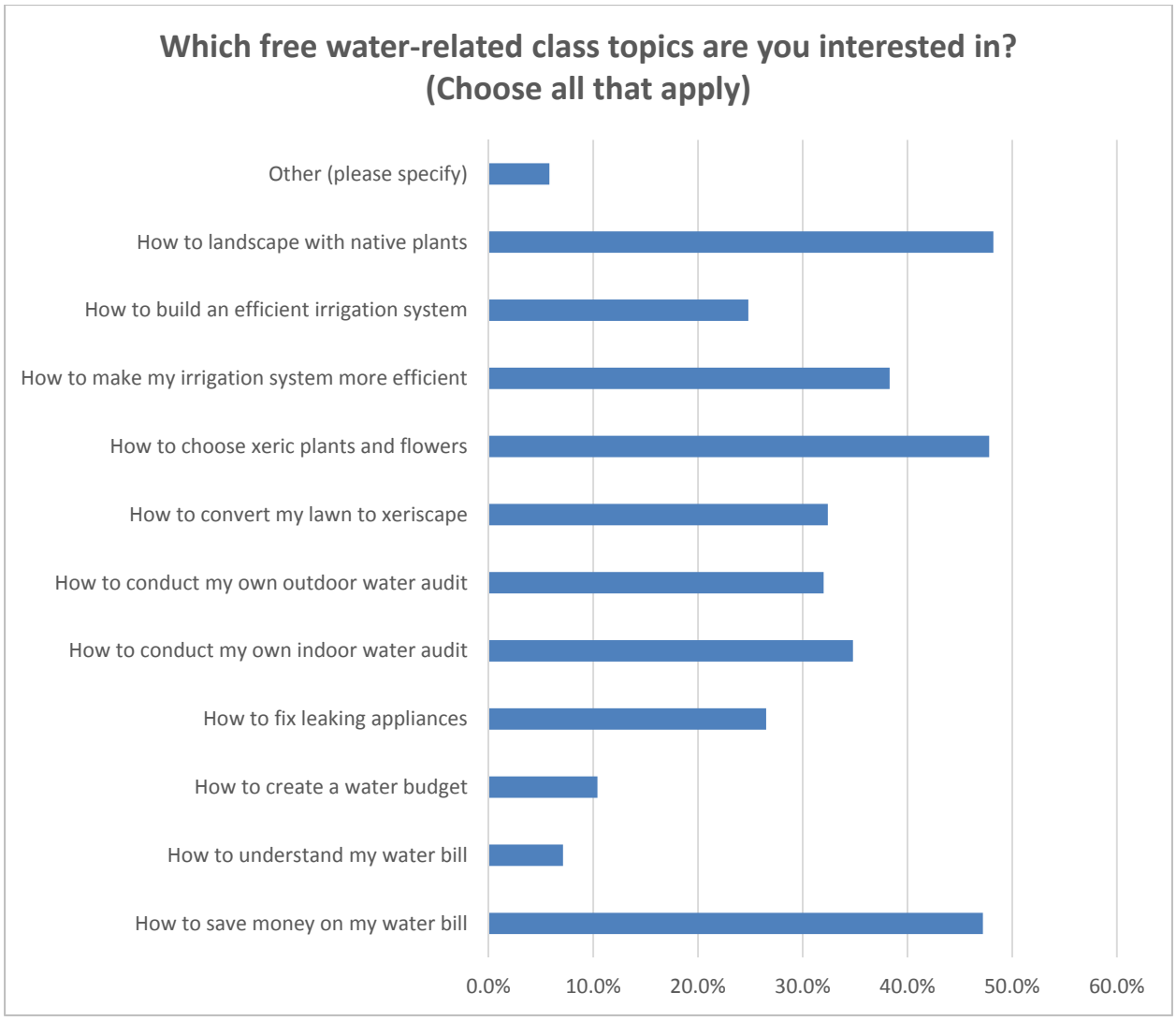
Only seen by those who answered yes to the previous question.

Answered: 977 Skipped: 431 Other: N/A

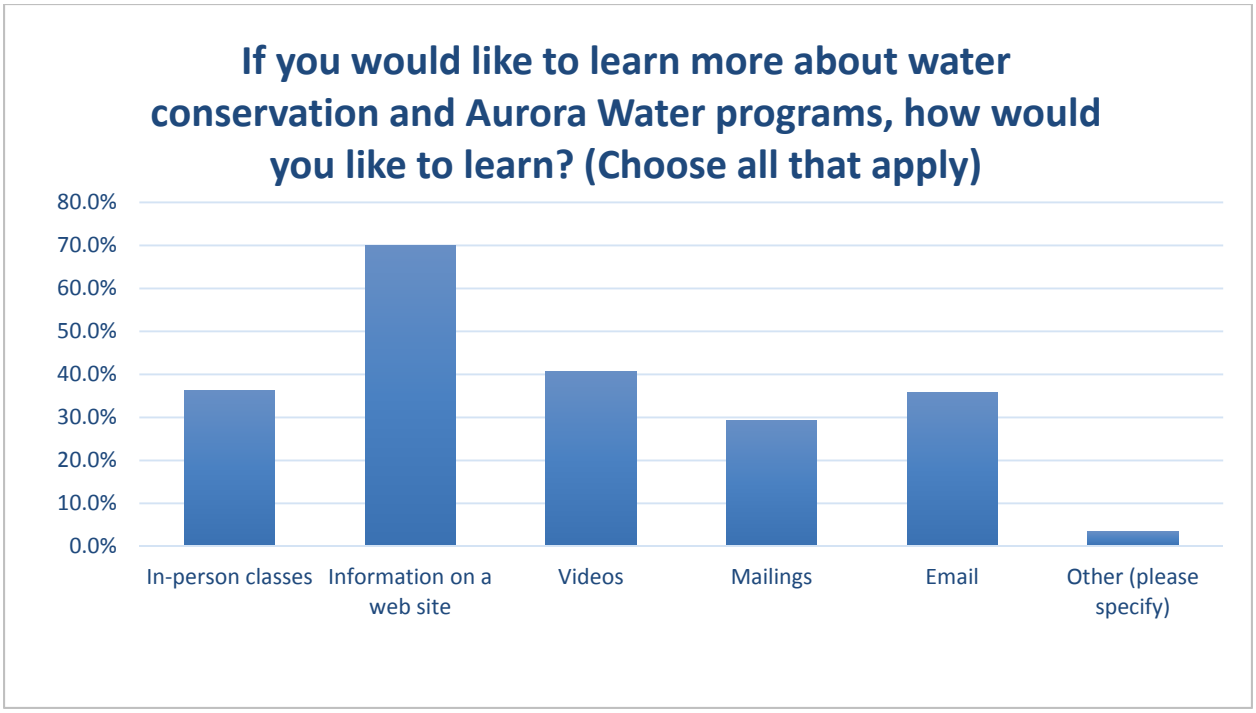


Only seen by those who answered yes to the previous question.

Answered: 667 Skipped: 741 Other: 117



Answered: 1,226 Skipped: 182 Other: 71



Answered: 1,251 Skipped: 157 Other: 42

Appendix I: Public Review Commentary and Reponses by Aurora Water

Date	Feedback Provided By	Section(s) of Plan	Public Feedback Summary	Aurora Water Response
6/3/15	Charles Stratton	2.0 and 4.0	This years conservation looks good but increasing demand should warrant incentives to cut back on general consumption. Continue the toilet rebate program, institute rebate programs to change landscaping from green to desert motif (this being the area of most potential cutback of domestic water use. Follow Calif. cutbacks now before it is necessary.	Incentivization programs will continue, however, greater emphasis will be placed on educating our customers on the return on investment opportunities fixture upgrading can achieve. Aurora has one of the oldest Xeriscape rebate programs in Colorado and we are expanding that program to include plant materials that require no additional irrigation after establishment.
6/3/15		All	How the city control the population grow compare to water usage? why the water rate is raised every year?	Growth containment is difficult to achieve and has both economic and political consequences. Aurora has planned for growth in our water planning and, with proper conservation measures in place, can meet the anticipated increase in population in the foreseeable future. As for water rates, Aurora has not increased our rates since 2010, and there is no water rate increase anticipated for 2016.
6/12/15	Geraldine Hanson	4.0 and 5.0	You came out and accessed our sprinkler efficiency and gave us some free water saving devises. This has proved helpful. Interested in xerascape but haven't had time to follow through. I think you are doing a great job and we as residents of Aurora need to take advantage of your efforts. Thanks.	We appreciate the comment. We will continue to work to improve our programs and are currently looking at expanding our xeriscape rebate in 2016. We hope to market these changes to get a greater participation from our customers in the future.
6/25/15	Sosanna Kuruvila	1.0	I am uneducated on this particular topic that I do not know what to say or comment on. All I have to say that stricter water usage should be implemented. I got my backyard landscaped beautifully and I have not missed the grass one day! We waste precious water all the time! Xeriscaping the front and backyards should be mandated. You are welcome to contact me , but I would have no expert suggestions to make, except we must, we must consult water conservation / efficiency experts to make changes.	Aurora Water Conservation is evaluating its xeriscape rebate and expanding options to include plant material that requires no supplemental water once established. We are also working with the Aurora Planning Department to help update their landscape code and ensure that water demand issues are considered.

Date	Feedback Provided By	Section(s) of Plan	Public Feedback Summary	Aurora Water Response
7/29/15	Rich & Claudia Banach	Appendix	First, thank you to the Water Board for all of your hard work. My primary question is what the status is to change the current Aurora water rates to a tier system similar to those in Boulder. Boulder's water rates are assessed by the square footage in a homeowner's lot. That, to me, seems most equitable. Aurora residents with small lots still have water going down the streets and into the sewer. Aurora residents with large lots still have large bills and brown lawns. As you can guess, we have a large lot. In July 2011, I wrote to Councilman Bob Roth (and can send you a copy of that letter if you'd like to see it). We had done everything that the City of Aurora recommended (removed turf - only 19% is now turf, got a water audit, redesigned/installed a new irrigation system, landscaped with only xeric shrubs and trees, re-used warm-up water, replaced toilets, got a water meter.) Bob Roth referred our letter to the city's Executive Management Team. Their verbal response was that we were "the poster child" for what the city wants homeowners to do. One person from the city did say not to get my hopes up - that the Water Board has said that "people who can afford those large lots can afford the water rates." This attitude seems ill informed. Meadow Hills Estates was annexed by the city and I believe that approximately half of its residents are retirees on a fixed income. Some residents have lived here prior to the annexation. Several other people from the city said it would be evaluating a system similar to that of Boulder where water rates are assessed based on the size of the lot. My questions are: • Has the city performed that evaluation? • What is the status of the evaluation? • What else can be done to provide relief to homeowners who own large properties? • What can be done to provide relief to homeowners who have done everything that they and the City can think of to conserve water and to minimize usage? Thank you so much.	Aurora continually reviews our water rate structure. Aurora currently uses an inclining block rate structure, utilizing blocks in 20,000 gallon tiers, the largest tier increments in the Front Range. Water budgets, on the other hand, are customized to allow of a variety of lot and family sizes. As a result, water budget rates are very difficult and expensive to implement. They also become difficult for property owners to properly utilize unless they have access to real-time water-use data, which Aurora is not capable of providing at this time.

Appendix J: Letter of Adoption

Water Department
City of Aurora
Water Administration
15151 E. Alameda Parkway, Ste. 3600
Aurora, Colorado 80012
303.739.7370
Worth Discovering • auroragov.org

Subject: Adoption of 2015 Municipal Water Efficiency Plan

Approved by: Marshall Brown (Director of Aurora Water)

Reviewed by: Joe Stibrich (Water Resource Management), Greg Baker (Public Relations Manager), Lyle Whitney (Water Conservation Supervisor)

Prepared by: Melissa Grove

Aurora Water is committed to enhancing and protecting the quality of life for Aurora citizens by providing safe, dependable and sustainable water, sewer and stormwater services, today and in the future. Water conservation is vital to future dependability and sustainability. This letter marks the adoption of the updated Water Efficiency Plan, from the original Plan adopted in 2007. Aurora Water intends to update the Water Efficiency Plan at least every seven years as required.

The adopted Water Efficiency Plan outlines historic conservation efforts, future conservation efforts, and anticipated savings from the implementation of a more robust conservation program. Aurora Water is committed to achieving a 10% reduction in gpcd from 2014 by 2040.

Adopted this 22nd day of September 2015.

Marshall Brown, Aurora Water Director

Appendix K: Glossary

AF	Acre-feet
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
AWWA	American Water Works Association
C	Commercial
CII	Commercial, Industrial and Institutional
CO	Certificate of Occupancy
CRAM	Central Resource Allocation Model
CWAC	Citizens' Water Advisory Committee
CWCB	Colorado Water Conservation Board
DRCOG	Denver Regional Council of Governance
DSS	Decision Support System
GPF	Gallon per Flush
HB1051	House Bill 10-1051
HE	High Efficiency
IR	Irrigation
IWMP	Integrated Water Master Plan
KGAL	Thousand Gallons
LIRF	Lawn Irrigation Return Flows
LP	Large Property
LUAM	Land Use Allocation Model
Metro	Metropolitan Wastewater
MF	Multi-family
MG	Million Gallons per Year
MGD	Million Gallons per Day
MGY	Million Gallons per Year
NRW	Non-revenue Water
O&M	Operations and Maintenance
PRV	Pressure Reducing Valve
PSI	Pounds per Square Inch
Sand Creek	Sand Creek Water Reclamation Facility
SFR	Single-family Residential
South Metro	South Metro WISE Authority
SWSI	Statewide Water Supply Initiative
T&D	Transmission and Distribution
UHET	Ultra High Efficiency toilet
WMP	Water Management Plan