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NORTH TABLE MOUNTAIN WATER AND SANITATION DISTRICT
14806 WEST 52ND AVENUE. GOLDEN. COLORADO 80403-1228

March 22, 2017

Colorado Water Conservation Board
Office of Water Conservation and Drought Planning
1313 Sherman Street, 7th Floor
Denver, CO 80203

RE: North Table Mountain Water and Sanitation District Water Efficiency Plan Update

Colorado Water Conservation Board:

Please find enclosed a copy of North Table Mountain Water and Sanitation District's (NTM) updated Water Efficiency Plan. The Plan was prepared in accordance with the 2004 Colorado Water Conservation Act by NTM staff to cover the 2016-2022 timeframe. The Water Efficiency Plan is not meant to be a static document, but rather a guidance document which enables NTM to meet its water savings goals. NTM staff will be responsible for implementing programs and collecting and evaluating data. Water conservation activities will be monitored and evaluated on an ongoing basis. The District may make modifications to programs as a result of data collected.

NTM provides water and sewer services to mostly residential users in unincorporated Jefferson County and the City of Arvada. The following table shows the total volume of retail water delivered and billed to NTM's customers from 2009 through 2015 along with the corresponding population. NTM's water supply comes from surface water. NTM has a contract with Denver Water for surface water.

Table of Water Use from 2009 to 2015

Year	Million-Gallons	Population
2009	764	9265
2010	871	9288
2011	867	9318
2012	955	9543
2013	760	9647
2014	794	9875
2015	842	10039

The Water Efficiency Plan public review and comment period ended on March 1st. Public comment has been incorporated into the plan under Appendix E. The Plan was presented to the North Table Mountain District Board of Directors and was approved and adopted. Please direct any questions about the Plan to North Table Water and Sanitation District's Project Engineer Wendy Weiman, at (303) 279-2854, x-306.

Sincerely,

Bart Sperry, PE
District Manager/Engineer

Enclosure: North Table Mountain Water & Sanitation District 2016-2022 Water Efficiency Plan

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2016-2022

Water Efficiency Plan

NORTH TABLE MOUNTAIN WATER & SANITATION DISTRICT
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District Manager

March 2017

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Introduction

Water Conservation Plan Purpose and Need

Water providers who annually supply over 2,000 af of water to retail customers each year are required to submit a Water Efficiency Plan (Plan) to the State Office of Water Conservation in accordance with the Colorado Water Conservation Act of 2004 (HB 04-1365). This Plan is submitted by the North Table Mountain Water and Sanitation District ("NTM" or "the District") to satisfy the requirements set forth in HB 04-1365. NTM developed their first Water Conservation Plan in 2009 to satisfy the requirements set forth in HB 04-1365 and that Plan was developed with the assistance of a grant from the Colorado Water Conservation Board (CWCB), a State agency whose mission is "To Conserve, Develop, Protect and Manage Colorado's Water for Present and Future Generations". Headwaters Corporation, a water resources and environmental consulting firm, was hired by the District to assist in the development of the 2009 Plan. With less than half of its potential service area developed, NTM recognized that a well-developed Water Conservation Plan would help manage current demands while ensuring the long-term reliability of its water supplies.

NTM has sufficient water to meet the demands of its current customers though in periods of drought both mandatory and voluntary drought mitigation measures are invoked. In 2002, NTM first imposed water restrictions in response to drought conditions. In 2007 the District decided to develop a Water Conservation Plan to evaluate a wide variety of potential conservation activities to select those that are most effective and appropriate for its customers. The Plan was completed in 2009. Despite NTM's small size and limited resources, it set some lofty goals in the 2009 Water Conservation Plan. As a result of this plan, conservation efforts have drastically increased over the last 6 years. Total cumulative water conservation savings for the 2009 through 2015 period are estimated at 1.88 billion gallons (or 5,785 af).

In addition to water savings, the Plan development process provided an important opportunity to educate District staff and our Board of Directors about water conservation and how it can be integrated in the operations and planning. A significant amount of time was also spent characterizing water use in the District which has helped the District better understand when, how and by whom water is being used.

NTM has developed this Water Efficiency Plan in accordance with the Colorado Water Conservation Act of 2004 (HB 04-1365) to cover the 2015-2022 timeframe. The Water Efficiency Plan is not meant to be a static document, but rather a guidance document which enables NTM to meet its water savings goals. NTM staff will be responsible for implementing programs and collecting and evaluating data, with assistance from other organizations and/or consultants as appropriate and necessary. Water conservation activities will be monitored and evaluated on an ongoing basis. Costs and water savings data will be collected, along with customer feedback where possible. The District may make modifications to programs as a result of data collected. Additionally, the water conservation programs and implementation schedule may be adjusted in response to the availability of staff and financial resources. Changes in technology, State and Federal laws, public perceptions, climatic conditions, and financial considerations, among others, may also impact NTM's water conservation programs. In addition to ongoing program management and evaluation, NTM staff will review the Plan and progress made towards its goals on a quarterly basis during one of their bi-monthly staff meetings. Results will also be presented to NTM's Board of Directors.

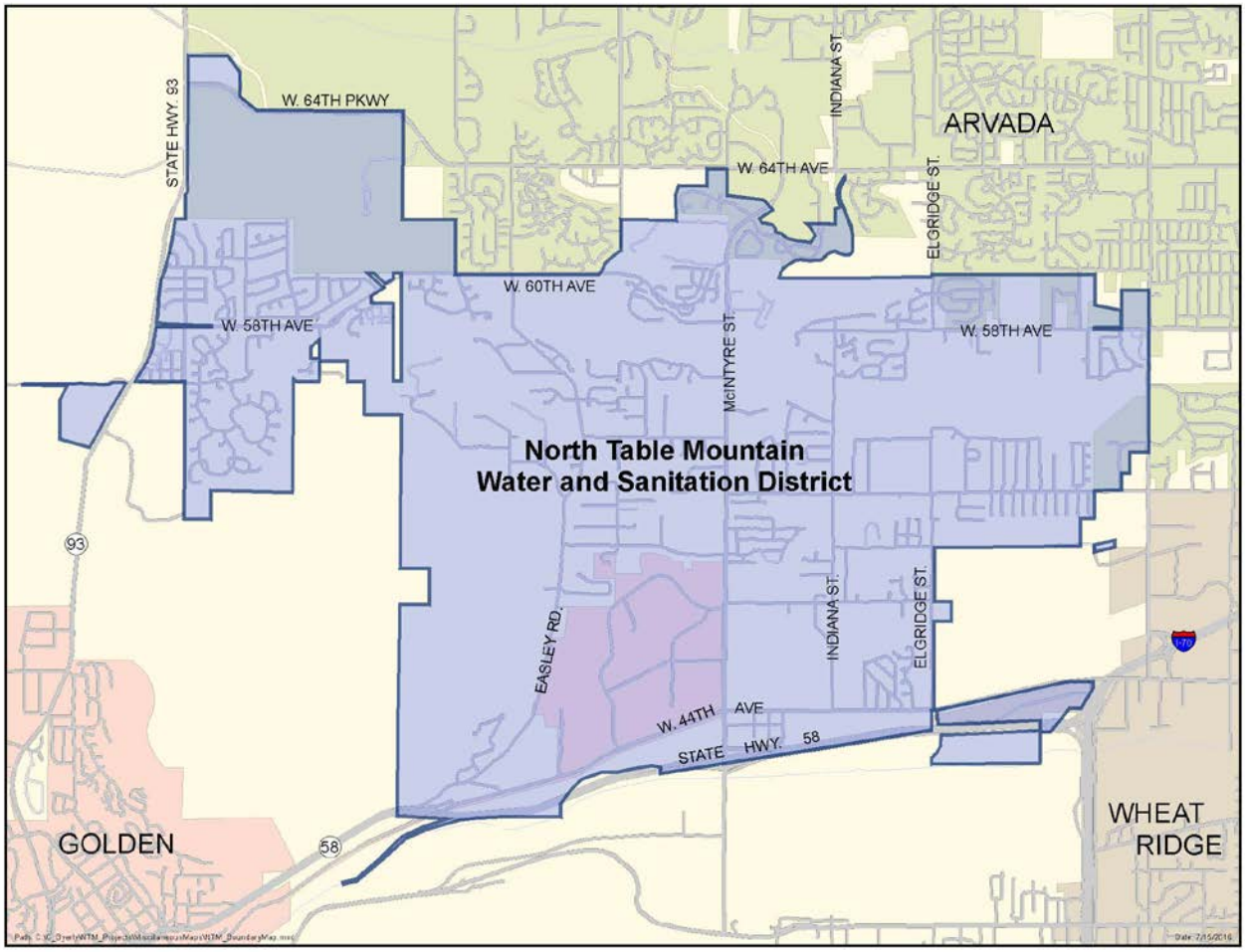
1.0 Profile of Existing Water Supply System

1.1 Overview

The District was formed on November 5, 1958 to provide water service to an area north and east of North Table Mountain as shown in ***Figure 1***. NTM is a special district, formed under State statutes with an elected board of directors. The NTM service area is predominantly residential in unincorporated Jefferson County and the City of Arvada. On January 5, 1967 the District's purposes were expanded to include complete sanitary sewage collection and transmission.

Historically NTM's service area has been dominated by horse properties and ranches interspersed with residential neighborhoods. In recent years development has increased as agricultural lands are converted to residential and commercial use. Between 2000 and 2007, approximately 811 new residential accounts were created (a 27% increase), since then there have been an additional 306 new accounts primarily for single family homes. NTM's surface water treatment plant currently treats around 5 million gallons of water per day during the peak season (summer months); 6.1 million gallons was a record high for the District in 2012 and 2014.

FIGURE 1 - SERVICE AREA MAP



NTM has a contract with Denver Water[1], originally signed in 1961, which entitles it to a maximum of 6,000 af of raw water annually in most years. 100% of the potable water delivered to NTM customers is treated Denver Water contract water. The term of the contract is until it is mutually terminated by both parties or in the case that NTM violates certain terms of the agreement. The contract also stipulates that "...such leases shall provide for limitation of delivery of water to whatever extent may be necessary to enable the Board to provide an adequate supply of water to the people of Denver...." As a result, during severe drought conditions Denver Water can require that NTM decrease its water use. For planning purposes, NTM assumes a firm yield of 6,000 af will be available from this source.

NTM's Denver Water contract surface water supply is delivered through Denver's northern collection system. The untreated water originates from the western slope and the South Boulder Creek watershed. Rainfall and snow melt from the western slope collect through natural channels and flow to the Winter Park/Fraser area. From there this water flows through the Moffat Tunnel under the Continental Divide. After exiting the tunnel on the east side of the Divide water continues through South Boulder Creek into Gross Reservoir. Water released from Gross Reservoir travels by gravity through natural streams and man-made canals to Ralston Reservoir in Jefferson County (built in 1936 by the City of Denver). Raw water is delivered directly from Ralston Reservoir, by two gravity lines (18" and 24"), to NTM's water treatment plant which is located at 19250 West 68th Avenue in unincorporated Jefferson County.

Wastewater Treatment and Storage

NTM contracts with Metro Wastewater Reclamation District (Metro Wastewater) for all wastewater treatment, similar to many other Front Range water providers. NTM is responsible for the wastewater collection system and lift stations required to deliver waste to Metro's system and maintains over 69 miles of sewer mains. Metro Wastewater charges the District for the treatment based upon the quantity of wastewater and contaminant loading.

1.2 Water Supply Reliability

The District's contract with Denver Water limits it to an instantaneous rate of 11,100 gallons per minute which is based on 16.0 million gallons per day (MGD). NTM's treatment plant is currently rated for 11 MGD. During the District's busiest periods, current use does not exceed 6.1 MGD. NTM utilizes a mixed-oxidant hypochlorite generator which eliminates the potential hazards of using chlorine gas disinfection. 5 treated water storage tanks are located throughout the service area, ranging in size from 0.5 to 2.5 million gallons. The District's total finished water storage capacity is about 7 million gallons. Water is delivered throughout NTM's service area by 96 miles of water mains. The District currently maintains 6 pump stations that serve 9 pressure zones.

[1] NTM purchases *raw* water from Denver Water via contract. This relationship is different than that of the 60+ water districts which purchase part or all of their *treated* water supply from Denver Water. NTM customers are not eligible to participate in Denver Water's conservation programs, rebates for example, while customers of water districts that purchase treated water are. Denver Water has nonetheless been very helpful during the development of this Plan.

In addition to its surface water supplies, NTM has groundwater rights for the aquifer under its service area, *located along the western edge* of the Denver Basin aquifer. Colorado Water Court has determined the annual amount of decreed groundwater totals about 2,200 af. NTM currently has no plans to develop this water which would be expensive to pump and treat. NTM also has raw surface water rights in several area ditches that total 304 af. Approximately 38 af is leased within District boundaries for pasture and plant nursery irrigation. The District is currently working with Prospect Park and Recreation to utilize ditch water for some park irrigation. Many of the older ranches in the District also have their own groundwater irrigation rights, but the District does not maintain this information. NTM's contract with Denver would probably allow the District to use raw water for irrigation; NTM would have to consult with legal counsel. However, NTM does not have the infrastructure to deliver the raw water we receive to any customers in the District.

1.3 Supply-Side Limitations and Future Needs

NTM's Conservation Plans have been developed focusing on Denver Water contract water which is treated and distributed by the District. At existing water use rates, NTM's demands would exceed its firm yield supply around 2048. This date may vary due to actual population growth patterns. Additionally, it is likely that as water use in the District begins approaching its firm yield, it will require developers to bring all or a portion of the water supply needed to meet the resulting increase in demands. Water conservation is an important demand management tool that will enable the District to ensure that its customers are using water efficiently and effectively into the future.

A summary of NTM system conditions is provided below in ***Table 1***. NTM currently has the supplies and facilities it needs to meet demands in its service area.

TABLE 1 - SUMMARY OF SYSTEM CONDITIONS
(Based on Worksheet A from CWCB Guidance Document)

PLANNING QUESTIONS	Yes	No	Comment
Is the system in a designated critical water supply area?	X		System is in Denver Metro SWSI[1] sub-basin for which conservation savings are pivotal to meeting future water demands.
Does the system experience frequency shortages or supply emergencies?		X	Water is contracted from Denver Water. Shortages occur when Denver Water is experiencing a shortage.
Does the system have substantial unaccounted-for and lost water?		X	An average of 6% of water distributed is non-revenue. This value is low compared to many water providers and is considered acceptable by industry standards.
Is the system experiencing a high rate of population and/or demand growth?	X		The area has been and expects to continue experiencing rapid population growth due to new development. Based upon current growth rates, NTM's service population could triple by 2036.
Is the system planning substantial improvements or additions?	X		Planned improvements are discussed in the "Future Projects" section of this Plan.
Are increases to wastewater system capacity anticipated within the planning horizon?		X	NTM contracts with Metro Wastewater for all wastewater treatment. NTM is responsible for adding and expanding wastewater conveyance lines to meet demands of new development.

[1] *SWSI = Statewide Water Supply Initiative*

The District has responded to system needs in a timely manner in the past with required improvements. A description of recently completed and planned projects is provided in Section 3.

2.0 Water Demands and Historical Demand Management

This section summarizes historic water demands and demand management.

Limitation with Demand Data

2008-2016 water use data was collected for this Water Efficiency Plan. The data from 2008 is invalid; NTM switched operating systems in 2008 and some data was not transferred correctly resulting in erroneous data. Therefore the data in 2008 is not included in this report.

2.1 Demographics and Service Area Characteristics

NTM provides treated water and wastewater services to approximately 10,039 people. NTM's service area is predominantly residential with a limited commercial and industrial base. Customer information is stored in the customer billing system. NTM classifies its customers into the following account types: residential (owner and tenant), commercial, industrial, greenhouse and irrigation. Residential accounts are identified as either "owner" or "tenant" accounts in NTM's billing system.

There are fewer than 200 tenant accounts and currently over 3,900 owner accounts. For this Plan, the term "residential" includes all owner and tenant accounts (single family and multifamily dwellings). Irrigation accounts provide water to parks and home owner association (HOA) outdoor irrigated areas, which may occasionally include recreational facilities such as swimming pools and public restrooms. In this Plan, such accounts are referred to as "Parks and HOA". Commercial customers include retail, service and similar industries as well as municipal customers such as fire departments and schools. Industrial customers are those who manufacture a product. Industrial customers may require water as an input to their processes. Commercial and Industrial customers also frequently have outdoor areas that receive seasonal irrigation.

Water Loss

In addition to water use by metered customers, the designation "Non-Revenue Water" (NRW) is used for the difference between distributed water (water leaving the treatment plant) and all metered (customer) water deliveries. System water loss or "Non-Revenue Water" (NRW) includes both "real" losses (water lost to system leaks or tank overflows) as well as "apparent" losses. Apparent losses may not be an actual loss of water but due to metering, billing, or accounting inaccuracies. Apparent losses have been estimated at around 1.5% and real losses at about 4.8%. NTM does meter and bill for construction water use but these uses are small and the data is not entered into the billing database. The amount of water used for this purpose is negligible.

2.2 Historic Water Demands

Time Period Represented

2008-2016 water use data was collected for this 2016 Water Efficiency Plan. The data from 2008 is not accurate as described in Section 2.0, under Limitation with Demand Data. Therefore the data in 2008 is not included in this report. Some data was also included from the 2009 Water Conservation Plan to compare historic water usage.

Seasonal Data Development

NTM reads meters for most accounts on a rolling quarterly basis (metering cycles), as discussed in Section 4.2.1 in the "Metering and Billing" section. As a result of quarterly readings it is difficult to compare use for similar periods among accounts in different cycles. To understand existing water use and evaluate potential savings it is useful to be able to view data on a monthly basis. This enables seasonal changes to be identified. NTM water use data was manipulated at the account level to estimate indoor and outdoor use by assuming that 100% of each customer's winter quarter use was "indoor". This baseline indoor water use was then removed from other quarters' readings and remaining use was classified as "outdoor". Monthly indoor use estimates were developed by dividing the "indoor" portion of each quarterly reading by three (the number of months in the quarter). Monthly estimates for outdoor use were developed by distributing quarterly "outdoor" water use among the months in that cycle based upon the monthly distribution from an evapotranspiration (ET) curve for the Front Range (NCWCD,2015).

Units

Water utilities and their customers typically think in terms of gallons of water used. When discussing water supply and demands units of af are more often used. An af is the amount of water it takes to cover one acre with water one foot deep. It equals 325,851 gallons and is the amount of water needed to supply between one to four households per year. This Plan includes both units, typically using gallons when referring to water use and af when referring to water supply.

Figure 2 provides a breakdown of total water use in 2015 by each account type. In 2015 single family homes and rental units (residential accounts) consumed over half of the water produced by NTM. In this same time frame Commercial accounts used 6%, Industrial 20%, Greenhouses 4%, Parks and HOA accounts 6% (which are primarily for irrigation) and 6% percent of water use in the District was Non-Revenue Water (NRW).

FIGURE 2 - 2015 PERCENT WATER USED BY ACCOUNT TYPE

(Total 2015 water use = 762 million gallons or 2339 acre-feet)

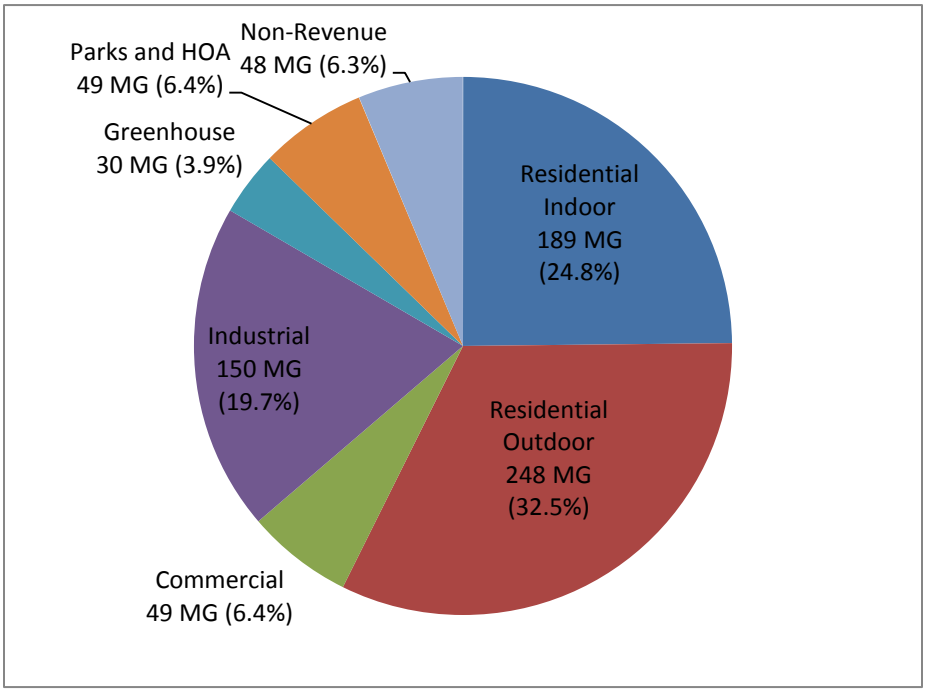


Table 2 shows annual water use by account type, including NRW. Residential users account for the majority of water use. ***Table 3*** lists the approximate annual number of accounts for each account type. Water demands for 2009-2015 (including losses) are shown in ***Figure 3***.

TABLE 2 - TOTAL ANNUAL WATER USE BY ACCOUNT TYPE

(1,000,000 Gallons)

Year	Residential	Commercial	Industrial	Greenhouse	Parks and HOA	NRW	Total (Distributed)
2009	423.1	58.8	73.7	16.5	53.0	68.6	693.7
2010	480.8	56.4	106.6	24.9	62.9	64.5	796.2
2011	476.5	52.0	113.6	25.0	65.5	61.8	693.7
2012	523.0	57.9	152.8	29.5	72.2	31.1	796.2
2013	400.0	45.7	136.9	28.3	40.9	27.4	794.4
2014	408.8	47.0	151.8	25.7	50.0	31.1	866.4
2015	437.2	48.5	150.0	29.5	49.0	48.1	762.3

TABLE 3 - APPROXIMATE ANNUAL NUMBER OF ACCOUNTS BY ACCOUNT TYPE

Year	Residential	Commercial	Industrial	Greenhouse	Parks and HOA
2009	3662	119	25	12	53
2010	3671	119	25	12	55
2011	3683	122	25	12	55
2012	3772	122	25	12	57
2013	3813	123	25	11	58
2014	3903	123	25	11	59
2015	3968	124	27	11	59

Total number of accounts by account type per year in which billing occurred. Number not adjusted for accounts closed or created mid-year. Any account active at any point in the year was counted. Data is collected from "Customer Accounts" section in the Annual Reports; Commercial/Industrial data broken down further under the "Water and Sewer Tap" section.

FIGURE 3 - ANNUAL WATER USE BY ACCOUNT TYPE

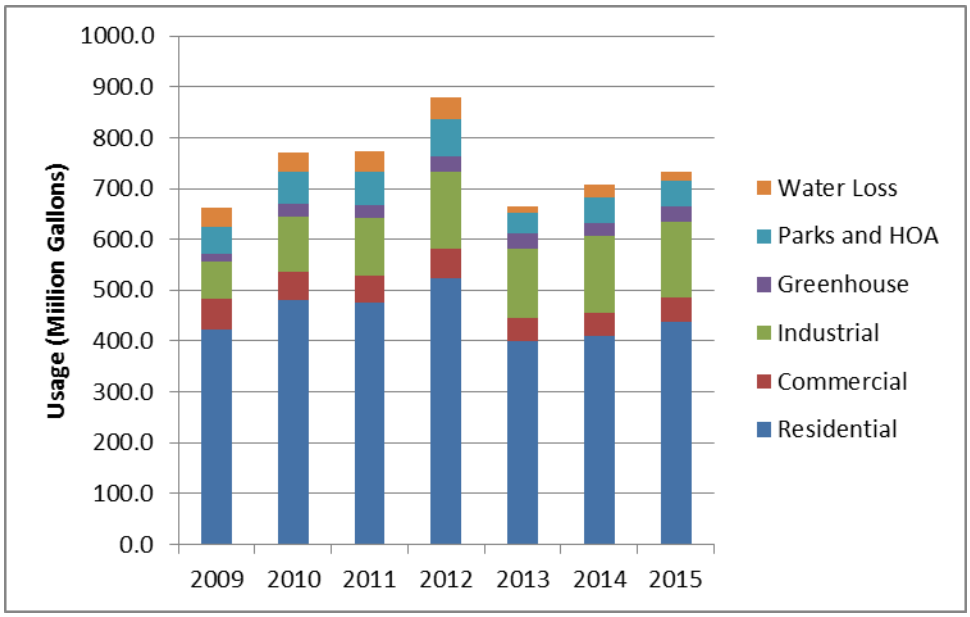


Table 4 shows approximate average annual use by account type during the 2000-2007 and 2009-2015 time frames. The data for 2000-2007 was taken from the 2009 Water Conservation Plan and the data for the 2009-2015 average was developed by dividing the annual totals from ***TABLE*** by the number of accounts in ***Table 3***. While this data is intended to provide a comparison between account types, it should be noted that wide variations in use among individual accounts likely exist. While total residential use accounts for the majority of water in the District's service area, each residential account uses much less water on average than other account types. Residential, individual industrial and greenhouse accounts use the most water, followed by Parks and HOAs and then commercial accounts. This shows that while non-residential accounts are less numerous, they should not be overlooked when evaluating potential water conservation activities, like monthly billing. Residential and Parks and HOA accounts experienced a 12.5% and a 10% decrease in water usage, respectively. This can be attributed to the conservation activities within the District. Greenhouse usage remained about the same and Industrial usage experienced a significant increase; this is probably due to an improved economy which created more production. The improvement of the economy could also be the reason more Industrial accounts were created. Industrial taps increased from 19 in 2000 to 27 in the year 2015, which is a substantial 42% rise in accounts.

TABLE 4 - APPROXIMATE AVERAGE ANNUAL USE BY ACCOUNT

(1,000 gallons)

Years	Residential	Commercial	Industrial	Greenhouse	Parks and HOAs
2000 – 2007 Average	136	405	3970	2261	1106
2009 – 2015 Average	119	430	5002	2215	994

Tables 5a and 5b provide total annual treated water data for the District. Total produced (or treated) is shown as well as "Recycled" water that is captured and recycled at the treatment plant. The District recycles 100% of its process wastewater and filter backwash water. This recycled water is metered and accounts for approximately 10% of total water produced. Distributed water is the volume leaving the water treatment plant (Produced minus Recycled). Billed water is what is metered as being used by NTM's customers. As discussed above, Non-Revenue water is the difference between Distributed and Billed.

Note that some fluctuation between years has occurred as a result of climatic and other conditions. In the 2009 report Non-Revenue Water (NRW) was about 6.1% of distributed water on average and around 5.7% in the 2016 report. A commonly accepted rule-of-thumb for acceptable levels of Non-Revenue Water is 15% of water leaving the treatment plant (Mays L., 2000), though this is highly variable and the industry is moving towards a more utility specific indicator. The District believes that the small volume of NRW is due to the manageable size of the system which enables NTM to quickly identify leaks and breaks, as well as the consistency of the types and age of pipes used throughout the system. The District also has had an aggressive main replacement program over the last decade, therefore there are less leaks. The lower water loss in the system could be due to less main breaks.

TABLE 5A - AVERAGE 2009 REPORT – HISTORIC TOTAL ANNUAL TREATED WATER DATA
(1,000,000 gallons)

Year	Total Produced	Recycled	Distributed	Billed	NRW (Distributed - Billed)	NRW Percentage of Distributed
2000-2007	767.5	78.6	688.9	646.2	42.7	6.1%

TABLE 5B - TOTAL ANNUAL TREATED WATER DATA
(1,000,000 gallons)

Year	Total Produced	Recycled	Distributed	Billed	NRW (Distributed - Billed)	NRW as Percentage of Distributed
2009	763.6	69.7	693.4	625.1	68.8	10%
2010	871.1	80.5	790.6	731.7	58.9	7%
2011	866.8	85.6	781.3	732.6	48.7	6%
2012	955.2	93.8	861.4	835.3	26.1	3%
2013	759.6	89.7	669.9	651.8	18.2	3%
2014	794.3	81.0	713.3	683.2	30.1	4%
2015	841.7	78.5	763.3	714.2	49.1	6%

Seasonal Use

Figure 4 shows total monthly water use 2015 for all metered accounts. Water use is lower in the winter and early spring, peaks in the summer, and decreases over the fall and early winter months. Increased use during summer months is due to outdoor water use, principally for landscape irrigation.

FIGURE 4 - 2015 INDOOR AND OUTDOOR MONTHLY METERED WATER USE

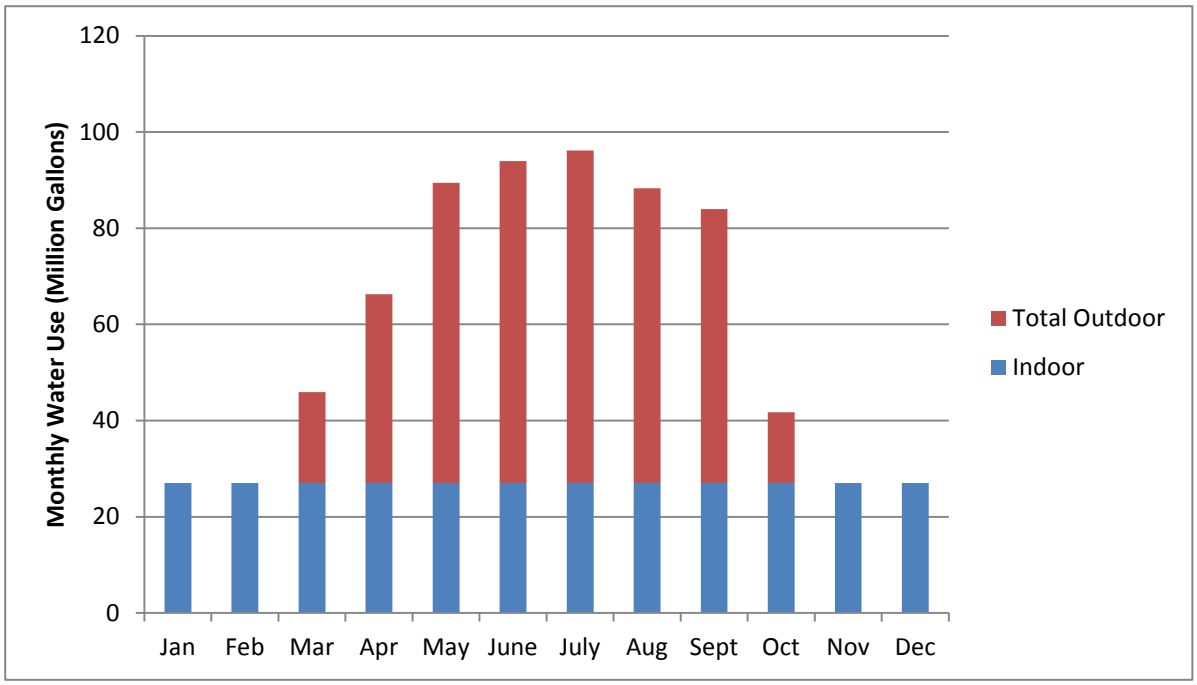


Table 6 presents 2015 average annual indoor and outdoor water use by account type as well as average total volumes (in units of gallons and acre-feet). Non-Revenue Water is not included. In 2015 outdoor water use accounted for approximately 55% of all metered water used in NTM's service area. This table also illustrates that residential water use, much of which is for outdoor irrigation, accounts for the majority of water use in NTM's service area. It is also interesting to note that commercial and industrial account use increases as a result of outdoor irrigation. Increased outdoor water use is due to landscape irrigation. This is best illustrated by Parks and HOA accounts where the indoor water use is essentially zero. The large amount of outdoor water use can be attributed to the District having some large agricultural type lots. These customers have large areas to irrigate and livestock that have water needs. The District has been experiencing new high density development. As new development takes the place of these larger lots it is anticipated that the outdoor/indoor water use ratio will tilt in the indoor direction.

TABLE 6 - 2015 INDOOR AND OUTDOOR WATER USE BY ACCOUNT TYPE

Percent Use						
	Residential	Commercial	Industrial	Greenhouse	Parks and HOAs	TOTAL
Indoor	43%	37%	66%	64%	0%	45%
Outdoor	57%	63%	34%	36%	100%	55%
Total	100%	100%	100%	100%	100%	100%

Total Water Use (1,000,000 gallons)						
	Residential	Commercial	Industrial	Greenhouse	Parks and HOAs	TOTAL
Indoor	189.2	17.9	98.6	18.8	0	324.6
Outdoor	248.0	30.6	51.3	10.7	48.6	389.2
Total	*437.1*	*48.5*	*149.9*	*29.5*	*48.6*	*713.8*

Total Water Use (acre-feet)						
	Residential	Commercial	Industrial	Greenhouse	Parks and HOAs	TOTAL
Indoor	580.6	54.9	302.6	57.7	0.0	996.2
Outdoor	761.1	93.9	157.4	32.5	149.1	1194.4
Total	*1341.4*	*148.8*	*460.0*	*90.2*	*149.1*	*2190.6*

Per Capita Use

Table 7 shows daily per capita (per person) system-wide and residential water use from the 2009 Report. Gallons per capita per day (gpcd) is a widely used metric to evaluate water use. It is the average daily volume of water used by each person in a water provider's service area. 2000 water use is representative of pre-conservation measures; this is important because we can compare gpcd usage now to 2000 to get an understanding of the effect that water efficiency has. Limited water efficiency efforts were made in 2002-2007 this is important for the same reason. For example the effects of conservation can be demonstrated by comparing water use from 2000 (pre-conservation) to 2015 (most recent conservation). Water use decreased from 259 gpcd in 2000 to 208 gpcd in 2015. Average annual residential use declined from 171 gpcd to 119 gpcd over the same timeframe. These numbers represent significant decreases in water use and are evidence that water conservation efforts are successful in the District. ***Table 8*** shows daily per capita (per person) system-wide and residential water use for the time-frame that the new water conservation measures went into effect. A continual decrease in water use can be seen. This can be attributed to new, more efficient fixtures and the water efficiency efforts the District has made as a result of the 2009 Water Conservation Plan.

TABLE 7 - HISTORIC AVERAGE DAILY WATER USE PER PERSON IN NTM'S SERVICE AREA

Year	Daily per Capita Water Use (gallons)	
	Residential	Total Water Use[2]
2000 – 2007 Average	148	224
2006 – 2007 Average	152	235

TABLE 8 - AVERAGE DAILY WATER USE PER PERSON IN NTM'S SERVICE AREA

Year	Population[1]	Daily per Capita Water Use (gallons)	
		Residential	Total Water Use[2]
2009	9265	125	205
2010	9288	142	233
2011	9318	140	230
2012	9543	150	247
2013	9647	114	190
2014	9875	113	198
2015	10039	119	208
2009 – 2015 Average		129	215
2014 – 2015 Average		116	203

[1] *Estimated service population was calculated by multiplying the average number of residential accounts (owners and renters) in the calendar year by 2.53 people per household which is the average household number for 2013 census blocks in and around NTM's service area.*
[2] *Total annual use includes billed and Non-Revenue water.*

2.3 Past and Current Demand Management Activities and Impacts to Demands

NTM began implementing limited water conservation and drought response measures in 2002. The 2009 Water Conservation Plan was a comprehensive plan to conserve water in the District. For a small district and with very sparse conservation measures this Plan was very aggressive.

The District implemented numerous conservation activities in the past 6 years. The 2009 Plan was designed to decrease total per capita water use (all treated water use in the District, not just residential) by 18% from the 2000 (prior to most conservation activities being implemented) an average of 259 gallons per capita per day (gpcd) to 212.7 gpcd by 2015. This is a savings of 46.3 gpcd; NTM exceeded that goal and saved 51 gpcd which, for the estimated population of 10,039, equates to a total savings of 574 af of water annually by 2015. The 2015 average total water use was 208 gpcd and 19.6% savings from 2000. The goal for residential use was to decrease from 171 gpcd to 141 gpcd over this same time period. NTM also exceeded that goal and decreased residential water use to 119 gpcd. The goal of this plan is decrease water usage by an additional 10% by 2022. To accomplish this goal the total and residential usage would decrease to 187.2 and 107 gpcd respectively.

In 2010, the District received a grant from the Colorado Water Conservation Board (CWCB) - The Water Efficiency Grant. The grant helped the District implement the following key components of the 2009 Water Conservation Plan:

- Sonic Leak Detection;
- Landscape Regulations; and
- Irrigation Audit Pilot Program.

The conservation activities that have been implemented since 2009 are shown in ***Table 9***. This table is based on Worksheet B from the Municipal Water Efficiency Plan Guidance Document. The following references were used to determine the savings estimates – Calculations for each program are listed in ***Appendix B*** of this document, The Guidebook of Best Practices for Municipal Water Conservation in Colorado (2010 Colorado Water Wise) and the 2009 NTM Conservation Report.

TABLE 9 - ANNUAL AND TOTAL 2009-2015 WATER SAVINGS BY PROGRAM

(Based on Worksheet B from CWCB Guidance Document)

Water Effeciency Activities	Period of Implementaion	Estimated Water Savings (gallons)							
		2009	2010	2011	2012	2013	2014	2015	Total 2009-2015
Water-Efficient Fixtures and Appliances									
Free Water Conservation Kits	On-Going	1,101,798	2,203,596	3,305,394	4,407,192	5,508,990	6,610,788	7,712,586	30,850,344
Upgrade NTM Office and Treatment Plant Fixtures and Appliances	2009	131,404	131,404	131,404	131,404	131,404	131,404	131,404	919,828
Regulations									
New Development Soil Amendment Regulations	2010 - Present		149,553	348,957	1,827,870	2,509,167	4,004,697	5,084,802	13,925,046
New Development Common Area Landscape Regulations	2010 - Present					1,785,960	3,214,728	5,000,688	10,001,376
Waste of Water Regulations	On-Going								
Summer Water Restrictions	On-Going	17,709,432	17,752,956	17,810,988	18,241,392	18,439,668	18,874,908	19,189,248	128,018,592
Water-Efficient Industrial and Commercial Water-Using Processes									
Existing Customer Efforts	On-Going	111,630,333	111,630,333	111,630,333	111,630,333	111,630,333	111,630,333	111,630,333	781,412,331
Water re-use systems									
Water Treatment Plant Backwash and Wastewater Reuse	On-Going	69,700,000	80,500,000	85,600,000	93,800,000	75,960,000	79,430,000	84,170,000	569,160,000
Distribution System Leak Detection and Repair									
Meter replacement Program	On-Going								
System Maintenance, Leak Detection and Repair	On-Going								
Individual Account Leak Dection	On-Going								
Fire Hydrant Replacement Program	2012				1,000,000	2,500,000	3,500,000	3,750,000	10,750,000
Education									
Increased Conservation and Water Use Education - NTM Report	2009 - Present								
Customer Water Use History available Web Site	2009 - Present								
Irrigation Audit (1 year pilot)	2012				352,201	704,401	704,401	704,401	2,465,404
Provide Historic Use Data on Water Bill	2011								
High Water Use Customer Assitance	On-Going								
Water Meter Loan Program	On-Going	37,332	70,516	120,292	178,364	236,436	265,472	306,952	1,215,364
Water Rate Structures and Billing Systems Designed to Encourage Water Use Effeciency in a Fiscally Responsible Manner									
Tiered Rate Structure	On-Going								
Billing System Software Upgrade	On-Going								
High Volume (Monthly) Customer Criteria	On-Going								
Other Water Management Activities									
Association Memberships	On-Going								
Drought Mitigation Measures	On-Going								
Collaborative Water Conservartion Relationships	On-Going								
Additional Savings									
Reflects Savings for Programs that are Difficult to Quantify	On-Going	43,614,126	44,829,674	46,295,428	47,832,473	49,738,042	51,114,878	52,865,831	336,290,452
TOTAL WATER SAVINGS		243,924,425	257,268,032	265,242,796	279,401,229	269,144,401	279,481,609	290,546,245	1,885,008,737

2009-2015 programs and measures are described below:

Water-efficient fixtures and appliances, including toilets, urinals, showerheads and faucets

1992 Energy Efficiency Law

Though not NTM specific, the passage of the Federal 1992 Energy Efficiency Law set maximum water use standards for fixtures and appliances. This has led to indoor water use savings as new developments are built with more water efficient fixtures and appliances and older buildings are gradually retrofitted.

Free Water Conservation Kits

NTM began providing free water conservation kits to customers in 2002. Kits can be picked up at NTM's offices. Each includes a water saving toilet displacement bag (easily installed in the toilet tank), non-toxic dye tablets to test for leaky toilets, a shower restrictor and a sink faucet restrictor. NTM informs customers that the kits are available by notification in bill inserts and postings on the website.

Low water-use landscapes, drought-resistant vegetation, removal of phreatophytes and efficient irrigation

Landscape and Irrigation Regulations

The District received funds from the CWCB to hire a Consultant to help develop the Landscape and Irrigation Regulations. The regulations help ensure that new developments use water efficiently, two new regulations were developed, a Soil Amendment Regulation and a New Development Common Area Landscape Regulation. The new regulations require that Landscape plans be completed by certified professionals and include a water budget.

Outdoor Watering Schedule

NTM follows Denver Water outdoor use restrictions. Initially restrictions were put in place to address a period of drought (2002). Since that time water providers have recognized the value of keeping some level of outdoor water restrictions in place to ensure that water is being used efficiently. NTM posts restrictions and watering schedules on their website and includes them as billing inserts.

Raw Water Irrigation

NTM has raw surface water rights in several area ditches totaling approximately 304 af/yr. 38 af of this is currently leased within the District for pasture and plant nursery irrigation. Another 20 af is leased outside of the District. Raw water irrigation does not decrease total water use but it does avoid unnecessarily treating water to drinking water quality. This

decreases the energy needed for treatment and pumping and minimizes the use of chemicals.

Water-efficient industrial and commercial water-using processes

Existing Industrial Customer Efforts (Not an NTM Program)

A few industrial customers in NTM's service area have, at their own initiative, made modifications that have resulted in significant decreases in water use. NTM is aware of, and would like to recognize, the following customers' conservation efforts:

Ball Metal Beverage Container Corp

The Ball Metal Beverage Container Corp has received numerous awards for its pollution prevention and waste minimization efforts. They have decreased their water use by approximately 60% in recent decades by:

- Upgrading their wastewater treatment system;
- Installing closed loop cooling towers;
- Switching to a variety of more water efficient, water free, and recycling processes;
- Decreasing irrigation water use; and
- Employee training and education.

International Paper

International Paper's Golden branch manufactures corrugated and solid fiber boxes. This company has decreased its water use by nearly 80% in the last 10 years. Activities related to these savings include:

- Throttled open loop cooling system used only when plant is in production (closed loop system could not provide necessary cooling);
- Decreased irrigation water use;
- Switching to more water efficient and water free processes; and
- Employee training and education.

Water reuse systems

Water Treatment Plant Backwash and Wastewater Reuse

NTM's water treatment plant produces wastewater (from clarifiers) and backwash water (from filters). NTM's treatment plant infrastructure and processes are designed to recycle nearly all of this water. In 2015, a total of 78.5 million gallons (240 af) of waste and backwash water was recycled.

Distribution system leak identification and repair

Meter Replacement Program

As meters age, they typically become less reliable and often slow down. This may result in low readings compared to actual water use. Properly maintained meters improve accuracy and allow NTM to more quickly detect leaks. In recent years NTM has initiated a meter accuracy investigation. Meters of varying size and age were tested. Only 4% of the meters tested were outside of the American Water Works Association (AWWA) recommended operating range. NTM will continue the meter accuracy investigation indefinitely.

Sonic Leak Detection (pilot)

The District performed a pilot program funded by a grant from the CWCB to determine if it would be cost effective to implement a permanent sonic leak detection program to be completed on a routine basis. In 2011, the District hired Advanced Leak Analysis & Solutions, Inc. (Advanced Leak Analysis) to provide a detailed leak survey of the water distribution system. The only system-problem that was discovered was a particular fire hydrant that is prone to leaking. 13 leaks were found to be coming from one specific brand of fire hydrant. In response to the survey findings, the District decided to implement an aggressive fire hydrant replacement program. The primary finding of the leak detection survey is that the District's existing maintenance and repair program is working well. Many utilities loose significant volumes of water through system leaks. Prior to this survey, the District did not have sufficient data to determine if unidentified problems existed within its system. Thanks to the "pilot" leak detection survey the District now knows that system water loss is minimal and their ongoing maintenance and repair operations are successfully identifying and addressing system leaks. The pilot project proved to be valuable because a new fire replacement project was born as a result of the findings; the project is discussed below.

Fire Hydrant Replacement Program

The District performed a Pilot Sonic Leak Detection program in 2011. As a result of that effort it was discovered that 13 leaks were found to be coming from Pacific States fire hydrants. The Pacific States hydrants are antiquated and prone to leaking. The District decided to implement a program to replace all Pacific States fire hydrants – not just the leaking ones – with more efficient, better quality hydrants that have been proven not to leak. The District estimates that there are 75 Pacific States hydrants throughout the system and the District plans to replace 100% of them. To date thirteen hydrants have been replaced. This program will continue until all of the Pacific States hydrants have been replaced.

System Maintenance, Leak Detection and Repair

System segments that have had multiple breaks or a break that indicates poor conditions are identified and scheduled for evaluation, repair, or replacement. In addition point

repairs to the system are promptly made as needed. NTM tracks leaks in the GIS database. Leaks are mapped and labeled by type so that visual analyses can be made of the break patterns. If it is determined that a specific area is prone to breaks it is designated for replacement. The District typically completed anywhere from 1 to 3 significant main replacement projects each year. Due to the amount of pipe that has been replaced and the decrease in main breaks the District has slowed down the main replacement projects and concentrated its efforts in other areas that could potentially save water.

Individual Account Leak Detection Program

In 2013 water meters were upgraded to a wireless technology that is capable of transmitting individual customer meters to a meter reading computer. Prior to this new technology, staff was only able to read meters on a quarterly basis. This new metering system allows our staff to collect data for the entire residential District once a month. Readings are flagged if it is outside of the normal use pattern. Customers can also now track monthly usage on their account page on the NTM website. Another feature of the meters is that they capture hourly readings. This is a benefit to NTM's customers and helps educate them on how much water they are using. The new water usage metering has been a great tool to promote water conservation.

AWWA Water Loss Audit

NTM staff attended training to understand how to utilize the American Water Works Association (AWWA) Water Audit Software v5.0. Staff completed an abbreviated Water Loss Audit for 2015 to better understand water loss in the District's system.

Dissemination of information regarding water use efficiency measures, including public education, water audits and water-saving demonstrations

Water Conservation Communications

NTM regularly communicates with residents regarding efficient water use and conservation. Each billing period, a "North Table Mountain Report" insert is included with customer's bills. The report frequently contains conservation related articles, watering restriction information, and other information designed to educate and inform customers about their utility and water use. NTM's website provides similar information as well as links to outside sites to help customers better understand and make decisions regarding their water use.

High Water Use Customer Assistance

The District flags accounts using water volumes much higher than would be expected for that type of account. If a leak is suspected, the District contacts the customer and sends a crew out to check for a leak. New technology allows staff to track water use on an hourly basis, this helps to determine if there is a leak and the source of that leak. If it is not a leak but water use is very high, NTM will attempt to work with the customer to help them decrease their water use to a more reasonable level.

Pilot Individual and HOA/Park Irrigation Audit Program

NTM performed a pilot program to provide free irrigation audits to customers. To decrease water use among customers with high outdoor water use rates, NTM contracted with the Center for Resource Conservation (CRC) to provide irrigation audits through the Slow the Flow Colorado program. NTM was able to fund this project from monies obtained from the CWCB Water Efficiency Grant. 21 residential and 5 large area (HOA and parks) audits were performed. For each audit, the irrigation system efficiency was evaluated and a set of customer-specific recommendations was developed, including watering schedule modifications and system maintenance.

Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner

Tiered Rate Structure

The District has a tiered rate structure in place. This is an increasing block tier structure, where the cost per unit of water increases as the consumer uses more water. In recent years the rate difference between tiers is large enough to promote water efficiency.

Regulatory measures designed to encourage water conservation

Summer Water Use Restrictions

Each year NTM reevaluates its Summer Water Use Regulations which typically mirror Denver Water's policies. 2015 regulations specified the following:

- No lawn watering between 10 a.m. and 6 p.m.
- Do not waste water by allowing it to pool in gutters, streets and alleys.
- Do not waste water by letting it spray on concrete and asphalt.
- Repair leaking sprinkler systems within 10 days.
- Do not use spray irrigation while it is raining or during high winds.
- There are no assigned watering days, but watering more than three days per week is prohibited.

Customers found breaking the watering rules receive a conservation card informing them of the regulations after the first violation. After a second violation they are contacted in person and provided information to remedy the situation and a warning of the fine for failing to do so. In the rare case that a customer continues to violate the regulations, fines are imposed.

Soil Amendment Regulation

The District developed a soil amendment regulation applicable to all new commercial, industrial, park, HOA and residential developments. A consultant was hired to review the regulations and NTM was able to fund this project from monies obtained from the CWCB

Water Efficiency Grant. Incorporating sufficient organic matter into soil can significantly decrease supplemental irrigation demands, as properly amended soil results in healthier plants and better retains moisture in the root zone where it can be utilized by plants. This greatly decreases irrigation needs.

New Development Common Area Landscape Regulation

The District developed landscaping requirements for HOA (common area landscaping and parks), which it has found are often very high water use areas. A consultant was hired to review the regulations and NTM was able to fund this project from monies obtained from the CWCB Water Efficiency Grant. NTM's new regulations require that landscape and irrigation systems for common areas and parks are designed by certified, licensed or similarly qualified landscaping and irrigation professionals. The regulation establishes that annual supplemental irrigation (in excess of natural precipitation) not exceed 15 gallons per square-foot. This provides developers and others with the flexibility to include higher water use turf areas by offsetting them with more water wise landscaping in other areas. Irrigation systems must be hydrozoned and have smart controllers. Water for irrigation must be metered separately from other uses.

Incentives to implement water conservation techniques, including rebates to customers to encourage the installation of water conservation measures

Water Conservation Kits

NTM's provides free Water Conservation Kits as an incentive to customers.

Tiered Rate Structure

The District has a tiered rate structure in place, with rates increasing with increasing water use. Customers have an incentive to keep water use in the lower costing tiers to save money.

Other water management activities

Association Memberships

NTM participates in the following organizations:

- American Water Works Association (AWWA)
- Backflow Prevention Association
- Special District Association
- International Association of Plumbing and Mechanical Officials
- Distributors Forum - local water agency monthly meeting to discuss Denver issues and current topics
- Conservation Committee - local water agency monthly meeting to discuss topics related to water conservation

- Colorado Rural Water
- Water Environment Federation (WEF)

Drought Mitigation Measures

NTM is required to impose drought restrictions at least as stringent as those imposed by Denver Water, which it purchases raw water from. Historically NTM has adopted more stringent restrictions during times of water scarcity.

2.4 Demand Forecast

According to the State Demography Office, Colorado's population is expected to grow to over 7.9 million by 2040, a 46% increase from the 2014 population estimate of 5.4 million (U.S. Census Bureau). Most of the State's growth is expected to occur along the Front Range. This is leading to increased competition among municipalities for available water supplies and overtime, costs will only continue to increase. The District's contract with Denver water is fixed and does not have an expiration date. The contract can only be terminated by mutual agreement. NTM's supplies are relatively secure as a result. However, as a member of the Front Range community, the District is committed to minimizing waste and encouraging the efficient use of water throughout their service area.

In March of 2015, NTM updated the evaluation of growth potential in and around its existing service area. Using landownership information, satellite imagery, topographic data, and density assumptions, an estimate of developable surface area was made. Potential growth both within NTM's Service area and land that may be annexed into the District at the time of development.

Based upon recent developments and the character of NTM's service area, it is likely that most new development in NTM's service area will be residential. To simplify future demand projections, this Plan assumes that 100% of future development will be residential. If Industrial and Commercial uses are a significant component of new service areas, water use could be higher than predicted in this Plan.

For planning purposes (based upon recent developments), NTM currently assumes a density of three houses per acre. Using this assumption, if all the land in NTM's service area and west of Highway 93 were developed and served by NTM, the service population could increase to include an additional 7,074 residences. Using U.S. Census Bureau estimates for NTM's service area of 2.53 people per residence, this equates to an additional 17,897 residents.

There is a great deal of uncertainty in predicting the timing and amount of future water demands as the majority of land is in unincorporated Jefferson County and development depends on the interests of buyers and sellers. Using NTM's 2015 service area population as the baseline and assuming a 3% annual growth rate (the 2016 report and 2009 report average). It appears NTM could reach it's build out population of about 28,000 around the year 2050 as shown in ***Table 10***. ***Table 10*** also shows forecasted demands assuming no modifications to demand management efforts.

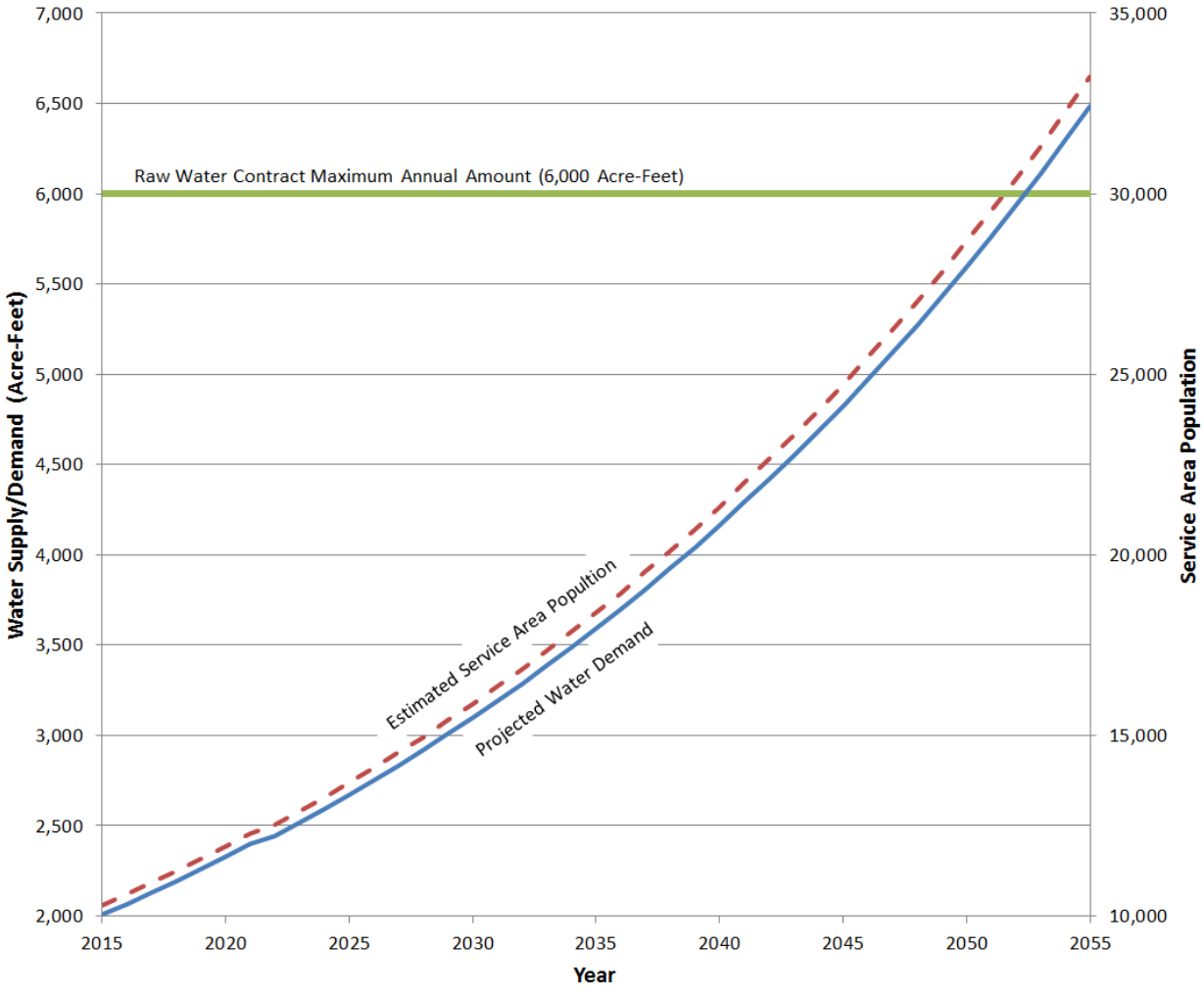
TABLE 10 - SERVICE AREA POPULATION AND DEMAND FORECAST

Year	Service Population Estimate	Annual Projected Water Use[1] Acre-ft	1,000,000 Gallons
2015	10,039	2284	744
2020	11,638	2648	863
2025	13,360	3039	990
2030	15,488	3524	1148
2035	17,954	4085	1331
2040	20,813	4735	1543
2045	24,128	5489	1789
2050 Build Out	27,971	6363	2074

[1] *2015 water use is actual. Projected water use for other years was calculated by applying the 2014-2015 system-wide average of 203 gallons per capita per day (to represent current water use rates) to the projected service population.*

Indoor fixtures and appliances currently available are more efficient than those in older existing homes. National plumbing codes and the Federal Energy Policy Act of 1992 ensure that toilets, showers and faucets meet efficiency standards. New homes in NTM's service area generally have much smaller lawns but tend to have more manicured landscaping requiring equal or higher outdoor water use than older homes. It is possible that more commercial or light-industrial development than anticipated could occur resulting in higher water use. For this reason, existing total water use rates of 203 gallons per capita per day were used to develop demand projections. Assuming the water used by new customers is at a rate similar to existing customers, water use could exceed NTM's 6,000 af/yr supply around the year 2048.

FIGURE 5 - PROJECTED ANNUAL WATER DEMAND AS COMPARED TO WATER SUPPLY



3.0 Integrated Planning and Water Efficiency Benefits and Goals

This section discusses water supply planning, planned capital improvement projects and recently completed projects and how water efficiency plays a role.

3.1 Water Efficiency and Water Supply Planning

The 2016-2022 Water Efficiency Plan will not have any major impact on projects currently planned by the District as these are all necessary to address current and upcoming needs. Water conservation savings will delay or reduce the need for additional supplies or infrastructure as new development occurs. Demands will increase more slowly enabling NTM to implement future projects at later dates. It may also be possible for the District to downsize some projects. The District will update its 10-Year Capital Construction Plan in 2018. Until this is done, exactly how water conservation savings will impact infrastructure needs and scheduling is unknown.

Land Planning

Jefferson County is currently responsible for land planning and zoning, therefore the District does not integrate water efficiency into land planning.

Impact on Revenue

The District collects the revenue it needs to operate through treated water and sewer charges and tap fees. Decreased water demands result in decreased revenue. Because the District's service area population is increasing at the same time that it is decreasing demands through conservation, it does not anticipate revenue impacts to be significant. NTM's Board of Directors reviews the District's tiered rate system annually. This provides the District with the ability to quickly adjust rates and fees if revenue issues emerge.

Recent Facility Improvements and Future Needs

The District has responded to system needs in a timely manner in the past with required improvements. A description of recently completed and planned projects is provided below.

Recently Completed Projects

Basin Retention Pond

NTM's water treatment plant produces waste water from the clarifiers and backwash water from the filters. NTM's treatment plant infrastructure and processes are designed to recycle nearly all of this water. A retention basin and new pump station were added for recycled water processes to keep up with demand.

Ward Lift Generator

A generator was replaced at a sewer lift station. This will ensure power back-up at a critical point in the sewer system in the case of an outage.

Arbutus and 50th Place Sewer Re-Line

A section of sewer was re-lined as a pilot study to determine if sewer re-lining is a method of reducing sewer infiltration that the District is interested in pursuing. It was learned that infiltration was cut down considerably on this section of sewer and has become part of an annual maintenance program for NTM.

Caromore Water Main Replacement

In 2010 approximately 3,000 lineal feet of 8 inch water main was replaced due to frequent main breaks and to upgrade the main size to improve operations.

Schreiner's Water Replacement

Approximately 2200 lineal feet of water main was replaced, in one of the oldest sections of the District to improve water quality and prevent main breaks. Pipe bursting was the method chosen for this project and it was the first time the District used this process and was very satisfied with it.

Treatment Plant Gravity Flow Conversion

In 2011, upgrades were made to the water system to utilize gravity flow instead of pumping water for a portion of NTM's water.

Miox Upgrade

NTM generates chlorine bleach for water treatment on-site. The old chlorine generation system was replaced with a new and more efficient one.

Sewer Infiltration Lining

Annual program to reduce maintenance and mitigate high ground water infiltration in the sanitary sewer system.

Apple Ridge Water Main Replacement

An approximately 40 year old water main was replaced that was failing due to corrosive soils.

2.5 Million Gallon Tank Zone PRV

Installed a pressure reducing valve in the system to create the ability to take the largest tank in the system off-line.

54th and Easley Valve Replacement

This project involved replacing valves on a large transmission line in the oldest part of the system. It was a challenging project that involved taking the largest tank and one of the pump stations off-line for over a week.

McIntyre Water Main Replacement at Croke Canal

This project involved replacing water main that was leaking and out of service for several years. The main was underneath a canal and required over 20 feet of excavation and lane closures on an arterial road.

Office/Treatment Plant (Supervisory Control and Data Acquisition (SCADA)/Camera

NTM applied for and received a grant from the Department of Homeland Security to install cameras at all of the tank locations and at the treatment plant. A computer system was set up to monitor all of the cameras and the SCADA system from the office.

Clearwell Sump

In case of contamination or an emergency, the only method of evacuating the treatment plant clearwell was to over-flow and flush it. This process is time consuming and wastes a large amount of water. This project allows the clearwell to drain directly into a sump and is pumped out, saving time, water and money.

Future Projects

The following are capital project needs that the District has identified. The District typically evaluates infrastructure and system capacity needs looking ahead five to ten years. The schedule for the following projects takes into consideration, water efficiency efforts.

Treatment Plant

- Dredge/Re-Line Ponds – There are 2 retention ponds used for recycled water. In order to increase capacity the ponds need to be dredged and re-lined.
- Treatment Plant Expansion – The expansion will include new administration space, labs and additional filters.
- Additional Settling Pond – In order to increase the flexibility of operations and increase the recycle water capacity a third pond will be added (anticipated completion 2019).

- Additional pre-treatment capacity/redundancy – In order to provide greater pre-treatment capacity and redundancy an additional pre-treatment train will be added to the Acti-Flo process. Two more filters would be added with this project. Design is scheduled to begin in 2018.

Distribution System Improvements

- Pipe Replacement - Replace water mains as necessary to keep up with aging infrastructure.
- Cathodic Protection – Evaluate the cathodic protection potential on some of the steel facilities in the system and determine where additional cathodic protection is needed.
- Improvements – As necessary for new development (ongoing).

Collection System Improvements

- Continue Groundwater Infiltration Study – On-going effort to examine the sewer collection system and attempt to determine areas of excessive infiltration.
- Relining/replacement based on results of infiltration/capacity studies.
- Sewer Lift Stations – Technology for lift stations is evolving; NTM will conduct a study to evaluate the aging lift stations. If it is determined that upgrades need to be made all of the stations should receive the same upgrades in order to ensure uniformity in all of the stations.

Construction Financial Plan Update

- NTM completed a 10-Year Construction Financial Plan in late 2015 to budget capital funds for future infrastructure needs. Every 2 or 3 years the District updates its 10-Year Construction Financial Plan to better reflect current conditions. The updated plans evaluate growth projections, aging infrastructure and funds available for construction in order to lay out the major capital projects that the District anticipates building.

Modified Forecasted Demands

Water conservation can play an important role in managing water demands. ***Figure 6*** illustrates projected water demands for the 2016 through 2022 period. "Without Conservation" is an estimate of what demands would be if no conservation was taking place in the District. The "Without Conservation" data was developed by taking water use data from the time period the District had very limited conservation measures that only included water restrictions (2002) and applying those numbers to a per capita water use rate then applied to population projections to estimate future demands without any conservation. Current Conservation Program estimates future demands based upon current water use rates and existing conservation in NTM's service area. "2016-2022 Water Efficiency Plan" estimates are predicted to occur as a result of implementing all of the conservation measures and programs adopted in this Plan. Demands are based upon a 3% annual increase in population (the 2000 to 2007 and 2009 to 2015 average growth

rate). In 2022 annual demands without any water conservation would be 767 af (250 million gallons) higher on average than with existing conservation. In 2022, demands will decrease by an additional 274 af (89 million gallons) as a result of conservation efforts.

FIGURE 6 - PROJECTED WATER DEMANDS FOR TREATED WATER IN NTM'S SERVICE AREA

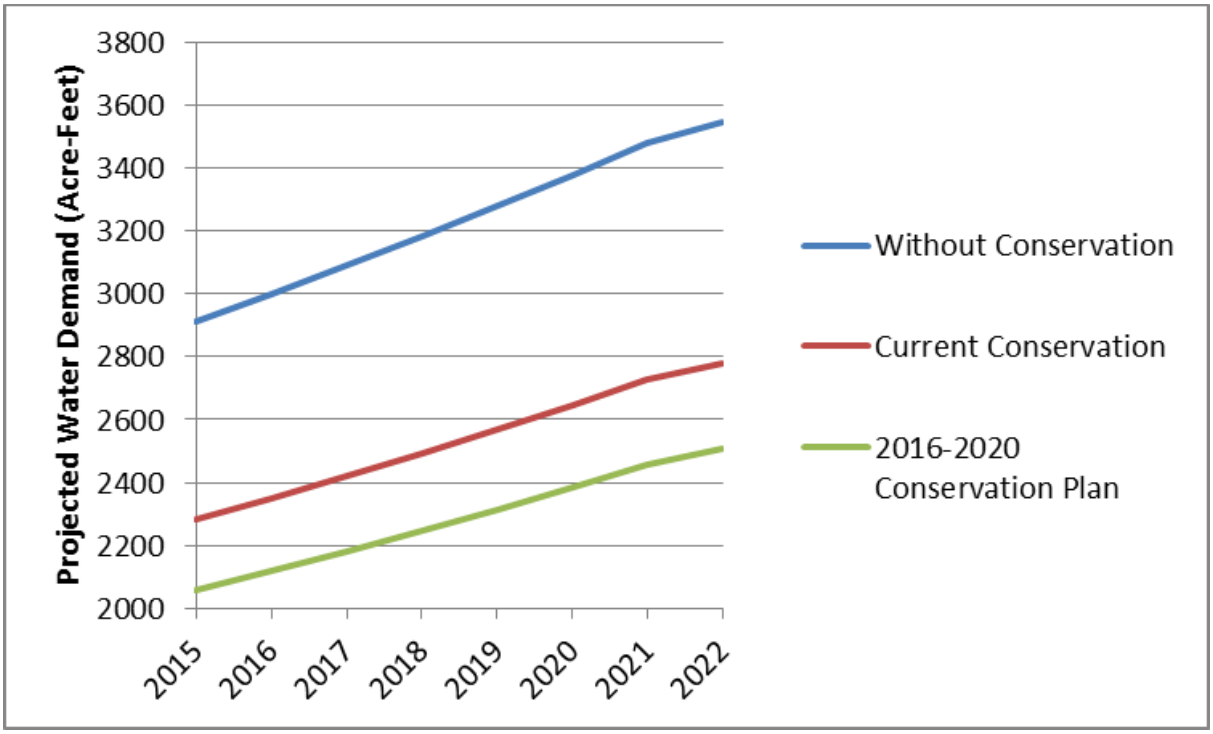


Table 11 shows projected water use in gallons per capita per day (gpcd) for the Plan period (2016-2022). Actual water use for 2000 (prior to the 2009 Plan) and 2014-2015 (included to represent recent actual use) are also provided. All water use is the total water distributed which includes billed water for all account types and water loss. Residential use was estimated at 66.2% of total water distributed based upon an analysis of historical data. 2022 water use shows a decrease of 15 gpcd for total water use and a decrease of 9 gpcd in residential use compared to 2014-2015.

TABLE 11 - ESTIMATED GALLONS PER CAPITA PER DAY (GPCD)

	Actual		Projected						
	2000	2014-2015 Avg	2016	2017	2018	2019	2020	2021	2022
All Water Use	259	203	199	195	192	190	188	188	188
Residential Use	171	116	114	111	109	106	106	107	107

Table 12 includes 2022 demand estimates for the projected population of 12,226 people under three scenarios: Pre-conservation program (based upon year 2000 water use), Current (based upon 2014-2015 average water use), and this Plan. Demands are shown in units of 1,000,000 gallons and

acre-feet. Gallons per capita per day (gpcd) use rates for each of these scenarios were multiplied by the projected 2020 population to get an annual total and residential use. Annual savings for total water use in 2022 (comparing water use between 2000 and NTM Plan water use) are 339 mg or 1041 af. This is a 29% decrease in water use since 2000. Residential use, which is included in the total savings estimate, is expected to decrease by 299 mg or 918 af. The difference is significant because it is comparing demands based upon a time when no conservation activities were implemented at all. However, it is important to understand the impact that water efficiency has.

TABLE 12 - THEORETICAL AND PROJECTED 2022 DEMAND ESTIMATES BASED UPON HISTORICAL AND PROJECTED PER CAPITA USE

2022 Demand Projections Based Upon	Projected 2022 Water Use (est. population 11,638)			
	Projected Total Annual Use		Projected Residential Use	
	1,000,000 gallons	acre-feet	1,000,000 gallons	acre-feet
Pre-conservation program (2000) water use rates (259 gpcd total, 171 gpcd residential)	1156	3547	763	2342
Current (2014-2015) water use rates (203 gpcd total, 116 gpcd residential)	906	2780	518	1589
Water use rates resulting from NTM's Plan (183 gpcd total, 104 gpcd residential)	817	2506	464	1424
Savings comparing pre-conservation (2000) use to NTM's Plan use	339	1041	299	918
Percent savings (pre-conservation compared to 2016-2022 NTM Plan)	29.4		39.1	

3.2 Water Efficiency Goals

The following goals for the 2015 NTM Water Efficiency Plan were developed by the District's staff, the Board of Directors and from the 2009 Conservation Plan:

- Decrease average total per capita annual use (total water use divided by population) by 10% from the 2015 average of 208 gallons per capita per day (gpcd) to 187 gpcd by 2022.
- Decrease residential water from 119 gpcd to 107 gpcd for this same period. (2014/2015 average total per capita water use was 203 gpcd which is a 14% decrease from 2006/2007 use.);
- Select water conservation programs and measures that are appropriate for NTM given its size and service area characteristics;
- Increase customer awareness (for all customer types) of the importance of water conservation;
- Provide technical assistance to help customers (for all customer types) decrease indoor and outdoor water use;

- Evaluate effectiveness of past programs, costs and staff needs for full program implementation;
- Ensure that new development uses outdoor water use efficiently through landscaping regulations;
- Continue to improve data collection to effectively monitor and characterize water use and conservation savings;
- Serve as an example for other small water providers with limited financial and staff resources; and
- Continue to utilize Plan development and implementation processes as opportunities to develop collaborative relationships with other water providers and water conservation organizations.
- Utilizing water loss audits to increase water loss management.

4.0 Selection of Water Efficiency Activities

This section presents the water efficiency activities selected for implementation and describes the processes used to identify, screen and evaluate each of these activities.

4.1 Summary of Selection Process

This subsection focuses on the process used to determine the activities selected for implementation. The following is discussed, evaluation criteria, activities re-selected, activities eliminated, new activities and modified activities. Program costs and projected water savings are also outlined.

Evaluation Criteria

The District evaluated the existing water efficiency activities. In addition to the District's existing water efficiency measures a variety of potential new activities were evaluated in this Water Efficiency Plan. Several qualitative and quantitative criteria were used in evaluating existing and potential conservation activities for selection. These include:

Feasibility of implementation

Technical, legal, political, institutional and other concerns can serve as impediments to certain conservation measures and programs. Because NTM is a special district it is more limited in the types of regulations it can enforce as compared to a municipal water provider. Over time such constraints may change.

Costs and water savings potential

NTM was strategic in selecting conservation activities for implementation that are likely to achieve the highest water savings within a realistic financial and staff time constraints.

Educational benefits

Education can provide customers with the resources and training they need to use water more efficiently. It is also important in instilling a value of water conservation. NTM has considered all customer types in developing its educational water conservation programs.

Best practice

To provide a positive example for its customers, some water conservation measures and programs were adopted due to their nature as best practices and ability to demonstrate NTM's commitment to promoting efficient water use.

Several of the conservation activities which were removed from further consideration in this Plan may be reevaluated in the future. These activities are described under "New Programs Removed from Further Consideration at the Present Time."

Potential Conservation Measures and Programs

Table 13 provides a complete list of the conservation activities considered in this Plan. The table specifies whether an activity is "Existing" (currently or previously implemented) or "New". The table also lists weather the program was selected for implementation. Narrative descriptions of existing conservation activities are provided in Section 2. New activities selected for implementation are described under "Summary Descriptions of 2016 -2022 Conservation Programs".

TABLE 13 - CONSERVATION MEASURES AND PROGRAMS IDENTIFIED IN THE PLANNING PROCESS

Water Conservation Program or Measure	Status	New or Continued Implementation Planned?	Notes
Water-efficient fixtures and appliances, including toilets, urinals, showerheads and faucets			
Free Water Conservation Kits	Existing	Yes	Increase promotion of kits
Toilet Leak Detection Kits	New	Yes	
Low water-use landscapes, drought-resistant vegetation, removal of phreatophytes and efficient irrigation			
Outdoor Watering Schedule	Existing	Yes	
Raw Water Irrigation	Existing	Yes	Ditch water
New Development Soil Amendment Regulation	Existing	Yes	
New Development Common Area Landscape Regulations	Existing	Yes	

Water Conservation Program or Measure	Status	New or Continued Implementation Planned?	Notes
Irrigation Audit Program	Existing	Yes	Offer audit to customers at a discount; pending Board approval of funds
Water Efficient Landscaping and Irrigation Educational Materials	Existing	Yes	
Annual Landscape and Irrigation System Seminar	New	Yes	May partner with the City of Golden
New Build Residential Soil Amendment Regulations	Existing	Yes	
Water-efficient industrial and commercial water-using processes			
Existing Customer Efforts	Existing	Yes	Not an NTM Project
Water reuse systems			
Water Treatment Plant Backwash and Incidental Water and Reuse	Existing	Yes	
Distribution system leak identification and repair			
Meter Testing Program	Existing	Yes	
System Maintenance, Leak Detection and Repair	Existing	Yes	
Individual Account Leak Detection Program	Existing	Yes	
Sonic Leak Detection Program (Pilot)	Existing	No	Performed a pilot study; program will not be continued. A new program "Fire Hydrant Replacement" was developed as a result.
Fire Hydrant Replacement Program	Existing	Yes	Implemented in 2011 as a result of the Sonic Leak Detection Pilot Study
Dissemination of information regarding water use efficiency measures, including by public education, customer water audits and water-saving demonstrations			
High Water Use Customer Assistance	Existing	Yes	
Increased Water Conservation and Water Use Education	Existing	Yes	
Educational Water Bills	Existing	Yes	
Water Meter Monitor Loan Program	Existing	Yes	
Landscape and Irrigation Seminar	New	Yes	May Partner with the City of Golden

Water Conservation Program or Measure	Status	New or Continued Implementation Planned?	Notes
Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner			
Tiered Rate Structure Modifications and Annual Evaluation	Existing	Yes	
Monthly Billing for Park and HOA Accounts	Existing	Yes	
Regulatory measures designed to encourage water conservation			
Waste of Water Regulations	Existing	Yes	
Landscape, Irrigation and Soil Amendment Regulations	Existing	Yes	

Summary Descriptions of 2016 -2022 Conservation Programs

Through the District's comprehensive 2009 Water Conservation Plan the District expanded conservation efforts from very limited measures to a wide range of activities. NTM is satisfied with the results of the efforts in that plan and will continue almost all of its existing conservation measures and programs in the 2016-2022 Plan. Below describes additional activities, current programs that will be modified or eliminated. Information on new conservation activities which were considered for this plan but which will not be implemented is provided in this section under "New Programs Removed from Further Consideration at the Present Time". All water conservation programs which are geared towards NTM's customers will continue to be promoted in the NTM Report and on the District's website.

Additional Activities

Annual Landscape and Irrigation System Seminar

NTM examined providing a free half-day landscaping and irrigation system class for its customers. NTM does not have the resources to accomplish this task. However, the District has considered partnering with the City of Golden. The City of Golden has an established annual seminar. NTM borders Golden; the seminars are currently held at the Golden Recreation Center which is a convenient location for District residents. The District met with the City of Golden to discuss a partnership. If the program is implemented NTM residents would be eligible to participate in The City of Golden's seminar. The class will be offered once a year in the spring. This would benefit District residents saving them water and money. It would also be beneficial to NTM to develop a conservation partner with the City of Golden.

Monthly Data for Analysis

Currently the District collects monthly data for customer use. The monthly data is not in a format that allows for conservation analysis. The District will develop a method to extract monthly data for system-wide water use analysis. This will allow staff to examine outdoor water use more closely; this would be a valuable tool.

Pressure Zone Metering

The District will install water meters at each pressure zone. This will allow staff to study water usage and water loss by pressure zone.

Fire Hydrant Replacement Program

The District performed a Pilot Sonic Leak Detection program in 2011. As a result of that effort it was discovered that 13 leaks were found to be coming from Pacific States fire hydrants. The Pacific States hydrants are antiquated and prone to leaking. The District decided to implement a program to replace all Pacific States fire hydrants – not just the leaking ones – with more efficient, better quality hydrants that have been proven not to leak. The District estimates that there are 75 Pacific States hydrants throughout their system and the District plans to replace 100% of them. To date thirteen hydrants have been replaced. This program will continue until all of the Pacific States hydrants have been replaced.

Modify Existing Programs

Individual and HOA/Park Irrigation Audit Program

NTM performed a pilot program to provide free irrigation audits to customers. The District does not have the budget to offer no–cost audits. This program may be modified to offer customer audits at a reduced rate by cost-sharing with the District. NTM can contract with the Center for Resource Conservation (CRC); the District pays a portion of each audit and CRC will offer the audits to customers at a reduced rate. This will make audits more affordable for NTM customers. For each audit, the irrigation system efficiency will be evaluated and a set of customer-specific recommendations will be developed, including watering schedule modifications and system maintenance.

AWWA Water Loss Audit

NTM used the AWWA Water Loss Control Committee (WLCC) Water Audit Software v5.0, 2014 to complete an abbreviated water loss audit of for 2015. NTM plans to expand this program and use the software to complete an annual water audit of its entire system, from source to metered water user. This process will provide NTM with a better understanding of its system and Non-Revenue Water (including both real and apparent losses). The audit will determine how much losses may be costing NTM and identify improvement areas. It

will also allow NTM to assess its water losses in comparison with other water utilities and to set performance targets.

Eliminated Existing Programs

Sonic Leak Detection

The District performed a Sonic Leak detection Pilot study to determine if sonic leak detection would be a beneficial and cost effective method of finding leaks and preventing water loss. The primary finding of the leak detection survey was that the District's existing maintenance and repair program is working well. Many utilities loose significant volumes of water through system leaks. Prior to this survey, the District did not have sufficient data to determine if unidentified problems existed within its system. Thanks to the "pilot" leak detection survey the District now knows that system water loss is minimal and their ongoing maintenance and repair operations are successfully identifying and addressing system leaks. Therefore, the District has determined the Sonic Leak Detection will not be continued as a conservation effort.

New Programs Removed from Further Consideration at the Present Time

This section describes new conservation measures and programs that have never been implemented but were considered for the 2016-2020 Water Efficiency Plan. NTM has decided to remove the following concepts from this Plan. Some activities may be reconsidered in the future.

Toilet Rebate Program

NTM considered implementing a toilet rebate program that would give rebates for low flow (1.6 gallons per flush) and high efficiency toilets (HET). The District would provide customers with a list of approved low flow and high efficiency toilets. Rebate of $25 for low flow toilets and $100 for HET toilets would be made up to a total of approximately $3,000 per year. Rebates would be on a first come first served basis and only to customers who are replacing older high water use toilets. Participants would be required to provide NTM with their account information so that NTM can monitor changes in water use. NTM does not currently have the funding or staff required to implement this project.

New Build Residential Irrigation Regulations

NTM considered developing irrigation regulations applicable to all new residences. This would require significant staff time and expertise beyond what is currently feasible for the District to review and enforce plans. The District instead decided to develop regulations for new development common area landscaping which is more reasonable to manage.

Low Flow Pre-Rinse Restaurant Sprayers

NTM considered promoting low flow pre-rinse sprayers, which can be an easy and effective way to save water in commercial and institutional settings. However, after looking at our

customer base, it was determined that there are very few restaurants and cafeterias in their service area. As a result this program is unlikely to have a significant impact and was removed from further consideration.

4.2 Demand Management Activities

For many programs, annual savings increase over time as water savings accumulate over the years. By 2022 total conservation savings, which include existing industrial customer efforts, are estimated at 2.04 billion gallons (or 6291 af). Assuming that total per person water use in the District is 208 gallons per capita per day (gpcd). Water saved between now and 2022 through conservation has the potential to serve an additional 4,370 people.

The conservation activities and savings that are planned for 2016-2022 are shown in ***Table 14***. This table is based on Worksheet B from the Municipal Water efficiency Plan Guidance Document, Calculations in ***Appendix C***, The Guidebook of Best Practices for Municipal Water Conservation in Colorado (2010 Colorado Water Wise) and the 2009 NTM Conservation Report (Prepared by Headwaters Corporation) were used to determine savings estimates. This data is preliminary and will be adjusted as better data is collected during program implementation.

4.2.1 Foundational Activities

TABLE 14 - ANNUAL AND TOTAL 2016-2022 ESTIMATED WATER SAVINGS BY PROGRAM

(Based on Worksheet B; CWCB Guidance Document)

Water Effeciency Activities	Period of Implementaion	Estimated Water Savings (gallons)							
		2016	2017	2018	2019	2020	2021	2022	Total 2016-2022
Water-Efficient Fixtures and Appliances									
Free Water Conservation Kits	On-Going	1,101,798	2,203,596	3,305,394	4,407,192	5,508,990	6,610,788	7,712,586	30,850,344
Regulations									
New Development Soil Amendment Regulations	2010 - Present	5,001,717	10,003,434	15,005,151	20,006,868	25,008,585	30,010,302	35,012,019	140,048,076
New Development Common Area Landscape Regulations	2010 - Present	920,376	1,840,752	2,761,128	3,681,504	4,601,880	5,522,256	6,442,632	25,770,528
Waste of Water Regulations	On-Going								
Summer Water Restrictions	On-Going	19,189,248	19,764,925	20,357,873	20,968,609	21,597,668	22,245,598	22,912,966	147,036,887
Water-Efficient Industrial and Commercial Water-Using Processes									
Existing Customer Efforts	On-Going	111,630,333	111,630,333	111,630,333	111,630,333	111,630,333	111,630,333	111,630,333	781,412,331
Water re-use systems									
Water Treatment Plant Backwash and Wastewater Reuse	On-Going	81,308,571	81,308,571	81,308,571	81,308,571	81,308,571	81,308,571	81,308,571	569,159,997
Distribution System Leak Detection and Repair									
Meter replacement Program	On-Going								0
System Maintenance, Leak Detection and Repair	On-Going								0
Individual Account Leak Dection	On-Going								0
Fire Hydrant Replacement Program	2012	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	21,000,000
Education									
Increased Conservation and Water Use Education - NTM Report	2009 - Present								0
Annual Landscape and Irrigation Sytem Seminar	2016 -2020	83,086	83,086	83,086	83,086	83,086	83,086	83,086	581,602
Customer Water Use History available Web Site	2009 - Present								0
Irrigation Audit	On-Going	41,534	83,077	124,620	166,163	207,706	249,249	290,792	1,163,141
Provide Historic Use Data on Water Bill	2011								0
High Water Use Customer Assitance	On-Going								0
Water Meter Loan Program	On-Going	41,480	82,960	124,440	165,920	207,400	248,880	290,360	1,161,440
Water Rate Structures and Billing Systems Designed to Encourage Water Use Effeciency in a Fiscally Responsible Manner									
Tiered Rate Structure	On-Going								0
Billing System Software Upgrade	On-Going								0
High Volume (Monthly) Customer Criteria	On-Going								0
Other Water Management Activities									
Association Memberships	On-Going								0
Drought Mitigation Measures	On-Going								0
Collaborative Water Conservartion Relationships	On-Going								0
Additional Savings									
Reflects Savings for Programs that are Difficult to Quantify	On-Going	43,614,126	44,829,674	46,295,428	47,832,473	49,738,042	49,738,042	49,738,042	331,785,827
TOTAL WATER SAVINGS		265,932,269	274,830,408	283,996,024	293,250,719	302,892,261	310,649,126	318,421,387	2,049,970,173

Metering, Billing and Demand Data Colleciton

100% of the taps in NTM's service area are metered, enabling the water utility to charge customers based on their actual water use. Multi-unit dwellings, which include apartments, condos, townhomes and some commercial accounts, typically have only one tap so charges are based upon building totals. The number of multi-dwelling units in the District is very small. The number of meters is outlined in Section 2.2; ***Table 3*** Approximate Number of Accounts by Account Type.

NTM's customers are broken into four metering, or billing cycle, areas (***Appendix A***). Cycles 1, 2 and 3 are geographically based. Cycle 4 is comprised of industrial and commercial accounts that are billed monthly. NTM bills most customers on a quarterly basis with a limited number of high water use industrial and commercial businesses being billed monthly. Bills are sent out on the 15th of the last month in their quarter. The following is the schedule for meter reading by cycle:

- Cycle 1 March, June, September and December
- Cycle 2 January, April, July and October
- Cycle 3 February, May, August and November
- Cycle 4 Monthly

NTM classifies its customers into the following account types: residential (owner and tenant), commercial, industrial, greenhouse and irrigation.

NTM is excited to report that in 2013 we completed an upgrade of water meters to a wireless technology (AMR) that is capable of transmitting individual customer meters to a special meter reading computer. The new equipment is efficient; in the past meters were only read on a quarterly basis. This new technology allows our staff to collect data for the entire residential District once a month. This monthly usage data is a valuable tool and has also proven to be a great benefit for our customers. Customers can now track usage on their account page on the NTM website. Another feature of the meters is that they capture hourly readings. This is a benefit to NTM's customers and helps educate them on how much water they are using. The new water usage metering has been a great water conservation tool for our customers. The data from the monthly tracking is not available to use for demand studies. Water use analysis still needs to be accomplished by using quarterly cycle billing data. A result of the Water Efficiency Plan it was discovered that there is a need to be able to have data that can be used for analytics. As the District advances this technology the monthly data will become available to track monthly water use on a more technical level. This enables seasonal changes to be identified. The goal is to have the monthly data available for water use analysis in the 2023 Conservation Plan.

Meter Testing

As meters age, they typically become less reliable and often slow down. This may result in low readings compared to actual water use. Properly maintained meters improve accuracy and allow NTM to more quickly detect leaks. In recent years NTM has initiated a meter accuracy investigation. Meters of varying size and age were tested. Only 4% of the meters tested were outside of the AWWA recommended operating range. NTM will continue the meter accuracy investigation indefinitely.

Water Efficiency Oriented Rates

NTM's rates and fees are structured to ensure the financial stability of the utility. Typically revenue streams are sufficient to cover overhead and system improvement capital costs without outside financing. North Table Mountain Water and Sanitation District has been debt free since December 2001. In 2015 NTM billed $4.49 million in water and sewer charges.

NTM utilizes a tiered rate structure where costs increase with increasing water use. In 2008, while developing the initial Water Conservation Plan, NTM completed a rate study which resulted in a rate increase and more rapidly inclining rate tiers. The new rate structure was designed to encourage water conservation while covering the costs associated with maintaining the District's water distribution and sewer collection system. The District feels like the new rate structure was effective in promoting water conservation. While rates increased by 30% to 80% depending on the volume of water used, they remain lower than many other Front Range communities. NTM reviews the rate structure on a routine basis. The District also lowered its minimum water use range from a minimum of 15,000 gallons/quarter to a minimum of 5,000 gallons/quarter. For NTM's lowest water use customers this results in lower water bills even though rates increased. NTM had another water rate increase for second tier users (5,000 to 60,000 gallons) in 2013. The minimum account fees were also raised to keep up with increasing administrative cost.

Rates for quarterly customers are charged per thousand gallon block as shown in ***Table 15***. In addition to charges for actual water used, NTM assesses a minimum charge for each account based upon meter (or tap) size (***Table 16***). Most residential accounts are 5/8" or 3/4" meters (taps). This fee was increased in 2013. This is not a charge on top of water use fees, but rather is a minimum charge which covers the District's costs of providing and maintaining services for accounts using minimal volumes of water.

TABLE 15 - NTM WATER RATES
(per 1,000 gallons)

QUARTERLY ACCOUNTS		
Gallons per quarter	**Average gallons per month**	**Cost per 1,000 gallons**
0 to 5,000	0 to 1,667	$3.19
5,000 to 60,000	1,667 to 20,000	$3.35
60,000 to 125,000	20,000 to 41,667	$4.98
Over 125,000	Over 41,667	$6.39
MONTHLY ACCOUNTS		
Gallons per month		**Cost per 1,000 gallons**
0 – 20,000		$2.67
Over 20,000		$2.96

TABLE 16 - NTM MINIMUM ACCOUNT FEES

Meter size	Minimum charge[1]	Quarterly allowance (gallons)
5/8" or 3/4"	$15.95	5,000
1"	$131.45	35,000
1 1/4"	$282.60	65,000
1 1/2"	$426.90	100,000
2"	$711.15	150,000
3"	$1,669.65	300,000
4"	$2,947.65	500,000
6"	$6,142.65	1,000,000

[1] Customers who are billed quarterly pay the minimum fee with each quarterly bill. High volume customers who are billed monthly pay 1/3rd of the charge with each bill.

Sewer Charges

Water use is typically higher in the summer as a result of outdoor irrigation (which does not return to customers' sewer lines). NTM bases sewer charges on individual accounts' winter quarter use when outdoor use is expected to be minimal. Each year, NTM sets each account's sewer charges for the next year as 130% of the previous winter quarter charge. These fees are used to maintain sewer infrastructure within the District and to pay Metro Wastewater for treatment.

System Water Loss Management and Control

NTM has a low amount of water loss, it experiences about 5.2% of Non-Revenue Water. System maintenance, Leak detection and efficient repair of main breaks is a priority and promotes management of system water loss. Below are current and planned programs to manage system water loss.

Meter Replacement Program

As mentioned in the metering section - when meters age, they typically become less reliable and often slow down. This may result in low readings compared to actual water use. Properly maintained meters improve accuracy and allow NTM to more quickly detect leaks. In recent years NTM has initiated a meter accuracy investigation. Meters of varying size and age were tested. Only 4% of the meters tested were outside of the AWWA recommended operating range. NTM will continue the meter accuracy investigation indefinitely.

Sonic Leak Detection (pilot)

As discussed in Section 2.3, the District performed a pilot program funded by a grant from the CWCB to determine if it would be cost effective to implement a permanent sonic leak detection program to be completed on a routine basis. In 2011, the District hired Advanced Leak Analysis & Solutions, Inc. (Advanced Leak Analysis) to provide a detailed leak survey of the water distribution system. The only system-problem that was discovered was a particular fire hydrant that is prone to leaking. 13 leaks were found to be coming from one specific brand of fire hydrant. In response to the survey findings, the District decided to implement an aggressive fire hydrant replacement program. The primary finding of the leak detection survey is that the District's existing maintenance and repair program is working well. Many utilities loose significant volumes of water through system leaks. Prior to this survey, the District did not have sufficient data to determine if unidentified problems existed within its system. Thanks to the "pilot" leak detection survey the District now knows that system water loss is minimal and their ongoing maintenance and repair operations are successfully identifying and addressing system leaks. The pilot project proved to be valuable because the District learned sonic leak detection is not a program that is worth continuing however, a new fire replacement project was born as a result of the findings; the project and is discussed below.

Fire Hydrant Replacement Program

As discussed in Section 2.3, the District performed a Pilot Sonic Leak Detection program in 2011. As a result of that effort it was discovered that 13 leaks were found to be coming from Pacific States fire hydrants. The Pacific States hydrants are antiquated and prone to leaking. The District decided to implement a program to replace all Pacific States fire hydrants – not just the leaking ones – with more efficient, better quality hydrants that have been proven not to leak. The District estimates that there are 75 Pacific States hydrants throughout their system and the District plans to replace 100% of them. To date thirteen

hydrants have been replaced. This program will continue until all of the Pacific States hydrants have been replaced.

System Maintenance, Leak Detection and Repair

As discussed in Section 2.3, system segments that have had multiple breaks or a break that indicates poor conditions are identified and scheduled for evaluation, repair, or replacement. In addition point repairs to the system are promptly made as needed. NTM tracks leaks in their GIS database. Leaks are mapped and labeled by type so that visual analyses can be made of the break patterns. If it is determined that a specific area is prone to breaks it is designated for replacement. In the recent past, the District typically completed anywhere from 1 to 3 significant main replacement projects each year. Due to the amount of pipe that has been replaced and the decrease in main breaks the District has slowed down the main replacement projects and concentrated its efforts in other areas that could potentially save water.

Pilot Individual and HOA/Park Irrigation Audit Program

As discussed in Section 2.3, to decrease water use among customers with high outdoor water use rates, NTM contracted with the Center for Resource Conservation (CRC) to provide irrigation audits through the Slow the Flow Colorado program. NTM was able to fund this project from monies obtained from the CWCB Water Efficiency Grant. 21 residential and 5 large area (HOA and parks) audits were performed. For each audit, the irrigation system efficiency was evaluated and a set of customer-specific recommendations was developed, including watering schedule modifications and system maintenance. The District does not have the budget to continue to provide free audits to customers; however the District will subsidize audits in the future.

Individual Account Leak Detection Program

As discussed in Section 2.3, in 2013 water meters were upgraded to a wireless technology that is capable of transmitting individual customer meters to a meter reading computer. Prior to this new technology, staff was only able to read meters on a quarterly basis. This new metering system allows our staff to collect data for the entire residential District once a month. Readings are flagged if it is outside of the normal use pattern. Customers can also now track monthly usage on their account page on the NTM website. Another feature of the meters is that they capture hourly readings. This is a benefit to NTM's customers and helps educate them on how much water they are using. The new water usage metering has been a great tool to promote water conservation.

AWWA Water Loss Audit

As discussed in Section 2.3, NTM staff attended training to understand how to utilize the American Water Works Association (AWWA) Water Audit Software v5.0. Staff completed an abbreviated Water Loss Audit of for 2015 to better understand water loss in the District's system.

4.2.2 Targeted Technical Assistance and Incentives

1992 Energy Efficiency Law

As discussed in Section 2.3, though not NTM specific, the passage of the Federal 1992 Energy Efficiency Law set maximum water use standards for fixtures and appliances. This has led to indoor water use savings as new developments are built with more water efficient fixtures and appliances and older buildings are gradually retrofitted.

Free Water Conservation Kits

As discussed in Section 2.3, NTM began providing free water conservation kits to customers in 2002. Kits can be picked up at NTM's offices. Each includes a water saving toilet displacement bag (easily installed in the toilet tank), non-toxic dye tablets to test for leaky toilets, a shower restrictor and a sink faucet restrictor. NTM informs customers that the kits are available by notification in bill inserts and postings on the website.

Landscape and Irrigation Regulations

As discussed in Section 2.3, the District received funds from the CWCB to hire a Consultant to help develop the Landscape and Irrigation Regulations. The regulations help ensure that new developments use water efficiently, two new regulations were developed, a Soil Amendment Regulation and a New Development Common Area Landscape Regulation. The new regulations require that Landscape Plans be completed by certified professionals and include a water budget.

Existing Industrial Customer Efforts (Not an NTM Program)

As discussed in Section 2.3, a few industrial customers in NTM's service area have, at their own initiative, made modifications that have resulted in significant decreases in water use. NTM is aware of, and would like to recognize, the following customers' conservation efforts:

Ball Metal Beverage Container Corp

The Ball Metal Beverage Container Corp has received numerous awards for its pollution prevention and waste minimization efforts. They have decreased their water use by approximately 60% in recent decades by:

- Upgrading their wastewater treatment system;
- Installing closed loop cooling towers;
- Switching to a variety of more water efficient, water free, and recycling processes;

- Decreasing irrigation water use; and
- Employee training and education.

International Paper

International Paper's Golden branch manufactures corrugated and solid fiber boxes. This company has decreased its water use by nearly 80% in the last 10 years. Activities related to these savings include:

- Throttled open loop cooling system used only when plant is in production (closed loop system could not provide necessary cooling);
- Decreased irrigation water use;
- Switching to more water efficient and water free processes; and
- Employee training and education.

Water Treatment Plant Backwash and Wastewater Reuse

NTM's water treatment plant produces wastewater (from clarifiers) and backwash water (from filters). NTM's treatment plant infrastructure and processes are designed to recycle nearly all of this water. In 2015, a total of 78.5 million gallons (240 af) of waste and backwash water was recycled.

High Water Use Customer Assistance

The District flags accounts using water volumes much higher than would be expected for that type of account. If a leak is suspected, the District contacts the customer and sends a crew out to check for a leak. New technology allows staff to track water use on an hourly basis, this helps to determine if there is a leak and the source of that leak. If it is not a leak but water use is very high, NTM will attempt to work with the customer to help them decrease their water use to a more reasonable level.

Upgrade NTM Office and Treatment Plant Fixtures and Appliances

In 2008 the District began replacing old appliances and fixtures in their office and water treatment plant with more efficient models. The District completed this project in 2009. The District will continue to evaluate and seek opportunities to make its facilities more water efficient.

4.2.3 Ordinances and Regulations

Summer Water Use Restrictions

As discussed in Section 2.3, each year NTM reevaluates its Summer Water Use Regulations which typically mirror Denver Water's policies. 2015 regulations specified the following:

- No lawn watering between 10 a.m. and 6 p.m.
- Do not waste water by allowing it to pool in gutters, streets and alleys.
- Do not waste water by letting it spray on concrete and asphalt.
- Repair leaking sprinkler systems within 10 days.
- Do not use spray irrigation while it is raining or during high winds.
- There are no assigned watering days, but watering more than three days per week is prohibited.

Customers found breaking the watering rules receive a conservation card informing them of the regulations after the first violation. After a second violation they are contacted in person and provided information to remedy the situation and a warning of the fine for failing to do so. In the rare case that a customer continues to violate the regulations, fines are imposed.

Soil Amendment Regulation

As discussed in Section 2.3, the District developed a soil amendment regulation applicable to all new commercial, industrial, park, HOA and residential developments. A consultant was hired to review the regulations and NTM was able to fund this project from monies obtained from the CWCB Water Efficiency Grant. Incorporating sufficient organic matter into soil can significantly decrease supplemental irrigation demands, as properly amended soil results in healthier plants and better retains moisture in the root zone where it can be utilized by plants. This greatly decreases irrigation needs.

New Development Common Area Landscape Regulation

As discussed in Section 2.3, the District developed landscaping requirements for HOA (common area landscaping) and parks, which it has found are often very high water use areas. A consultant was hired to review the regulations and NTM was able to fund this project from monies obtained from the CWCB Water Efficiency Grant. NTM's new regulations require that landscape and irrigation systems for common areas and parks are designed by certified, licensed or similarly qualified landscaping and irrigation professionals. The regulation establishes that annual supplemental irrigation (in excess of natural precipitation) not exceed 15 gallons per square-foot. This provides developers and others with the flexibility to include higher water use turf areas by offsetting them with more water wise landscaping in

other areas. Irrigation systems must be hydrozoned and have smart controllers. Water for irrigation must be metered separately from other uses.

4.2.4 Educational Activities

Water Conservation Communications

NTM regularly communicates with residents regarding efficient water use and conservation. Each billing period, a "North Table Mountain Report" insert is included with customer's bills. The report frequently contains conservation related articles, watering restriction information, and other information designed to educate and inform customers about their utility and water use. NTM's website provides similar information as well as links to outside sites to help customers better understand and make decisions regarding their water use.

High Water Use Customer Assistance

The District flags accounts of customers using water volumes much higher than would be expected for that type of account. If a leak is suspected, the District contacts the customer and sends a crew out to check for a leak. New technology allows staff to track water use on an hourly basis, this helps to determine if there is a leak and the source of that leak. If it is not a leak but water use is very high, NTM will attempt to work with the customer to help them decrease their water use to a more reasonable level.

Pilot Individual and HOA/Park Irrigation Audit Program

NTM performed a pilot program to provide free irrigation audits to customers. To decrease water use among customers with high outdoor water use rates, NTM contracted with the Center for Resource Conservation (CRC) to provide irrigation audits through the Slow the Flow Colorado program. NTM was able to fund this project from monies obtained from the CWCB Water Efficiency Grant. 21 residential and 5 large area (HOA and parks) audits were performed. For each audit, the irrigation system efficiency was evaluated and a set of customer-specific recommendations was developed, including watering schedule modifications and system maintenance. The District does not have the funds to continue to provide free audits to customers but NTM will subsidize customer water audits.

Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner

Tiered Rate Structure

The District has long had a tiered rate structure in place, with rates increasing with increasing water use. Historically differences between tiers have been small and increased occurred only with large increases in the volume of water used.

5.0 Implementation and Monitoring Plan

The State requires that Water Efficiency Plans be accompanied by a schedule for their implementation and that plans are reviewed and updated at least every seven years. This Plan is designed to cover the 2016 – 2022 timeframe. The Water Conservation Plan is not meant to be a static document, but rather a guidance document which enables NTM to meet its water savings goals.

Table 18 lists each Plan component with a schedule for implementation and data that will be collected to assist with Program monitoring and evaluation. Begin dates are when initial actions toward implementing each program are scheduled to be initiated. Programs may not be available to District customers until the following year if program start up requires significant time. Additionally, the implementation schedule may be adjusted in response to the availability of staff and financial resources. District staff will be responsible for implementing programs and collecting and evaluating data, with assistance from other organizations and/or consultants as appropriate and necessary.

Water conservation activities will be monitored and evaluated on an ongoing basis. Costs and water savings data will be collected, along with customer feedback where possible. The District may make modifications to programs as a result of data collected. Changes in technology, State and Federal laws, public perceptions, climatic conditions, and financial considerations, among others, may also impact NTM's water conservation programs. In addition to ongoing program management and evaluation, NTM staff will review the Plan and progress made towards its goals on a quarterly basis during one of their monthly staff meetings. Results will also be presented to the Board of Directors.

Impact on Revenue

The District collects the revenue it needs to operate through treated water and sewer charges and tap fees. Decreased water demands result in decreased revenue. Because the District's service area population is increasing at the same time that it is decreasing demands through conservation, it does not anticipate revenue impacts to be significant. NTM's Board of Directors reviews the District's tiered rate system annually. This provides the District with the ability to quickly adjust rates and fees if revenue issues emerge.

In addition to the individual conservation measures and programs schedule provided in ***Table 17***, the District has developed the following overall program schedule:

TABLE 17 - WATER CONSERVATION PROGRAM SCHEDULE

Year	Action
2016-2017	Develop and continue conservation programs and measures
2016–2022	Ongoing program management, data collection, and modification (if appropriate)
2021-2022	Develop Updated Water Conservation Plan for 2022 – 2029 period

TABLE 18 - WATER EFFICIENCY PLAN IMPLEMENTATION SCHEDULE AND MONITORING REQUIREMENTS

Water Conservation Measure/Program	Begin Date	End Date	Required Actions	Data to be Collected
Meter Testing Program	Existing	Ongoing	Continue existing program	• Meter replacement and recalibration data
System Maintenance, Leak Detection and Repair	Existing	Ongoing	Continue existing program	• Problem, location and maintenance/repair work completed • Water savings estimates
Individual Account Leak Detection Program	Existing	Ongoing	Continue existing program	• Issues and how addressed • Water savings estimates
Water-Loss Audit	2017	Ongoing	Annually: Complete AWWA Water-Loss Audit Software	• Audit findings and recommendations • Maintenance/repairs/modifications made as a result • Water savings estimates
High Water Use Customer Assistance	Existing	Ongoing	Continue existing program	• Issues and how addressed • Water savings estimates • Customer feedback
Increased Water Conservation and Water Use Education	Existing	Ongoing	2017-2018: Improve upon existing program Ongoing: Increase promotion of materials	• Copies of all materials sent out Customer feedback
Water Meter Monitor Loan Program	Existing	Ongoing	Ongoing: Promote Water Meter Monitor Loan program among high water users	• List of customers meters loaned to • Customer feedback • Water use and savings estimates
Tiered Rate Structure Modifications and Annual Evaluation	Existing	Ongoing	Ongoing: Review rates annually	• Water use data • Annual Revenue • Rates and fee information
Billing System Software Upgrade	Existing	Ongoing	Continue to update and upgrade software Ongoing: utilize to track and educate customers about their water use	• Track customer use

Water Conservation Measure/Program	Begin Date	End Date	Required Actions	Data to be Collected
Waste of Water Regulations	Existing	Ongoing	Ongoing: Enforce regulations	• Violations and enforcement activities • Collect water usage from entities that were required to comply with new regulations for creating a water budget and compare it to the water budget.
Association Memberships	Existing	Ongoing	Ongoing: Maintain memberships	• List of memberships
Collaborative Water Conservation Relationships	2009	Ongoing	Ongoing: Maintain and develop relationships	• Document assistance provided and collaborative projects

Cost and Water Savings Estimates

Estimated program costs, water savings, and assumptions are provided in ***Table 19***. They are presented in terms of 2016 dollars and no adjustments were made for the time value of money. The costs presented only include additional costs specific to the District's water efficiency program. Existing staff time and other costs that are covered under the District's annual operating and maintenance (O&M) budgets were not included. Due to the seven year timeframe of these calculations product lifespan was not considered in the cost analysis. It was not possible to quantify costs and/or water savings for all programs. Many of the values provided in ***Table 19*** are preliminary and will be adjusted as better data is collected during program implementation.

Total program costs are estimated to be $79,870. Ongoing annual costs are much lower at $9,750 which is about 0.3% of the District's annual budget. Ongoing costs could increase if the District decides to expand programs as they are currently designed. Additional costs to NTM (excluding existing staff time and costs covered by the O&M budgets) for water saved range from $0 to around $1,000 per acre-foot of water. Even the high end of costs per acre-foot is significantly lower than current costs of securing new water supplies along the Front Range which can easily range upwards of $15,000 per acre-foot. Decreasing demands slows the need for new water supplies as well as new and expanded infrastructure, resulting in additional savings.

TABLE 19 – WATER CONSERVATION PROGRAM COSTS AND WATER SAVINGS ESTIMATES

Water Effeciency Activities	Start Date	Estimated NTM Program Costs (Excluding Staff Time)			Estimated Water Savings (1000 gallons)			Total 2016-2022 Cost per 1,000 Gallons Saved
		Start-Up Cost	Annual Cost	Total 2016-2022	One Year	Annual in 2022	Total 2016-2022	
Water-Efficient Fixtures and Appliances								
Free Water Conservation Kits	On-Going	$0	$160	$1,120	1,102	7,713	30,850	$ 0.04
Regulations								
New Development Soil Amendment Regulations	2010 - Present	$0	$0	$0	5,002	35,012	140,048	
New Development Common Area Landscape Regulations	2010 - Present	$0	$0	$0	920	6,443	25,771	
Waste of Water Regulations	On-Going	$0	$0	$0	0	0	0	
Summer Water Restrictions	On-Going	$0	$0	$0	19,189	22,913	147,037	
Water-Efficient Industrial and Commercial Water-Using Processes								
Existing Customer Efforts	On-Going	$0	$0	$0	111,630	111,630	781,412	
Water re-use systems								
Water Treatment Plant Backwash and Wastewater Reuse	On-Going	$0	$0	$0	81,309	81,309	569,160	
Distribution System Leak Detection and Repair								
Meter replacement Program	On-Going	$0	$0	$0				
System Maintenance, Leak Detection and Repair	On-Going	$0	$0	$0				
Individual Account Leak Dection	On-Going	$0	$0	$0				
Fire Hydrant Replacement Program	2012	$0	$1,500	$10,500	3,000	3,000	21,000	$ 0.50
Education								
Increased Conservation and Water Use Education - NTM Report	2009 - Present	$0	$4,000	$28,000				
Annual Landscape and Irrigation Sytem Seminar	2016 -2020	$0	$2,500	$17,500	83	83	582	$ 30.09
Customer Water Use History available Web Site	2009 - Present	`	$0	$0				
Irrigation Audit	On-Going	$0	$250	$1,750	42	291	1,163	$ 1.50
Provide Historic Use Data on Water Bill	2011	$0	$0	$0				
High Water Use Customer Assitance	On-Going	$0	$0	$0				
Water Meter Loan Program	On-Going	$0	$0	$0	41	290	1,161	
Water Rate Structures and Billing Systems Designed to Encourage Water Use Effeciency in a Fiscally Responsible Manner								
Tiered Rate Structure	On-Going	$0	$0	$0				
Billing System Software Upgrades	On-Going	$0	$0	$0				
High Volume (Monthly) Customer Criteria	On-Going	$0	$0	$0				
Other Water Management Activities								
Association Memberships	On-Going	$0	$3,000	$21,000				
Drought Mitigation Measures	On-Going	$0	$0	$0	0	0	0	
Collaborative Water Conservartion Relationships	On-Going	$0	$0	$0	0	0	0	
Additional Savings								
Reflects Savings for Programs that are Difficult to Quantify	On-Going				43,614	49,738	331,786	
Total			$9,750	$79,870	265,932	318,421	2,049,970	

6.0 Adoption, Public Review and Formal Approval of Water Efficiency Plan

6.1 Public Review Process

The support and involvement of NTM's customers is critical to the success of this Water Efficiency Plan. To solicit their input on the Efficiency programs and measures that the District will implement over the next seven years, public input was solicited during a public comment period[1] which occurred from February 1 through March 2nd, 2017. A link to the draft plan was posted on NTM's website (www.ntmwater.org). Notices of the Plan's availability and the public comment period were included in the mailing of bills, on the main page of the District's website and in the Golden Transcript weekly newspaper. Copies of the notices, comments and NTM responses are included in Attachment E. Comments on the draft Water Efficiency Plan were requested to be received by March 3rd, 2017. Comments could be delivered by phone, mail e-mail or in person ((by March 3, 2017) to:

Wendy Weiman
Project Engineer
North Table Mountain Water and Sanitation District
14806 West 52nd Avenue
Golden, CO 80403
(303) 279-2854
conservation@ntmwater.org

6.2 Local Adoption and State Approval Processes

Draft and Final Plans were also submitted to NTM's Board of Directors for their input. The Board passed a resolution adopting the Final Plan on March 14th (Attchment F). Draft Plan was submitted to the State for comment. NTM addressed the comments and submitted the Final Plan for approval to the State on March 15th, 2017.

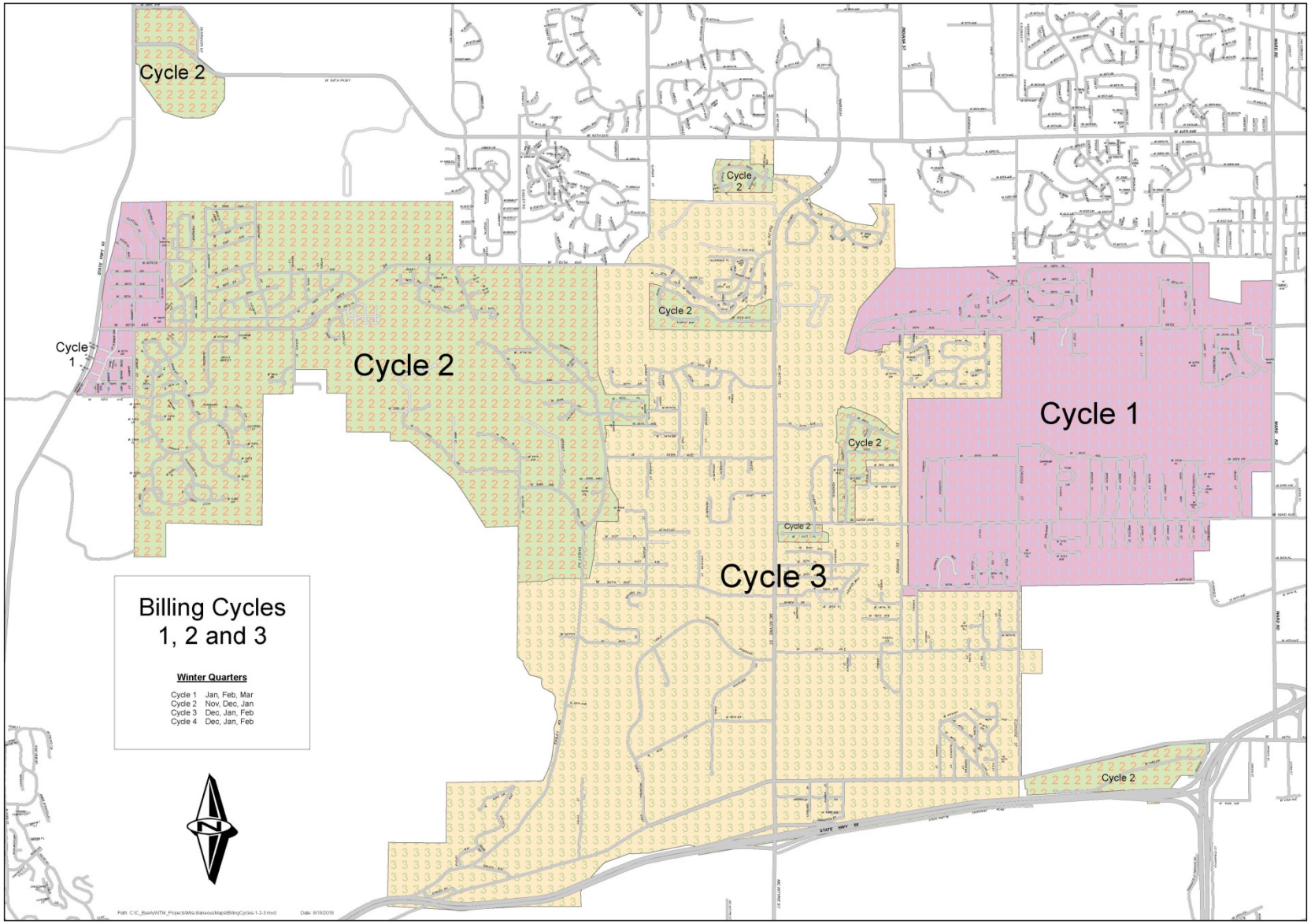
6.3 Periodic Review and Update

The District plans to review and update this conservation plan every seven years. The next update is scheduled to be completed in 2022.

[1]The District's Board of Directors passed a resolution (Attachment D) at their February 12, 2008 Board meeting authorizing a 30 day public review period for the Water Conservation Plan.

Appendix A Billing Cycle Map
Appendix B Water Savings Result Estimates for 2009-2015 Programs
Appendix C Water Savings Result Estimates for 2016-2022 Programs
Appendix D Resolution for 30 Day Comment Period
Appendix E Notice of Public Review Period
Comments Received
Responses
Appendix F Resolution to Adopt Water Efficiency Plan

APPENDIX A


Cycle 2
Cycle 2
Cycle 2
Cycle 1
Cycle 2
Cycle 1
Cycle 2
Cycle 2
Cycle 3
Cycle 2
Billing Cycles
1, 2 and 3
Winter Quarters
Cycle 1 Jan, Feb, Mar
Cycle 2 Nov, Dec, Jan
Cycle 3 Dec, Jan, Feb
Cycle 4 Dec, Jan, Feb
N

APPENDIX B

Water Savings Result Estimates for Implemented 2009-2015 Programs

Free Water Conservation Kits

- NTM's conservation kits include 1 toilet displacement bag, 1 shower and 1 faucet restrictor, and toilet leak detection dye tablets. This District assumes that 40 kits will used by customers annually.
- Each toilet bag displaces 0.5 gallons. Assuming an average of 5.1 flushes/person/day (Vickers, 2001) and 2.53 people/home, this results in a savings of 2,354 gal/home/yr. For 40 bags, the total annual savings will be 94,191 gallons.
- Shower restrictors decrease maximum flow to 2.5 gal/min. Assuming 4 gal/min was being used before restrictor was installed, for one 8 minute shower/person/day (Aquacraft, 2006) this saves 12 gallons. For 2.53 people per home, 40 kits would result in a total annual savings of 443,256 gallons.
- Sink restrictors decrease maximum flow to 1.5 gal/min. Assuming 2.5 gal/min was being used before restrictor was installed, for 8.1 min/person/day (Vickers, 2001), this results in a savings of 8.1 gal/person/day. For 2.53 people/home, 40 kits would result in a total annual savings of 299,197 gallons.
- Toilet dye tablets: Assuming 5% of toilets in U.S. homes leak and that the average leaks 180 gal/day (estimated based upon data provided in Vickers, 2001), two toilets can be checked with each kit so 4 of the 100 toilets tested are estimated to leak. Assuming these are fixed, this would result in an annual savings of 262,800 gallons.
- Total annual savings resulting from 40 kits (assuming only 5% of toilets tested need to be fixed for leaks) is 1,101,798 gallons.

Upgrade NTM Office and Treatment Plant Fixtures and Appliances

- Three 1.6 gal/flush toilets were recently installed in NTM's office for a savings of 20 gal/toilet per day (Vickers, 2001). Two 1.6 gal/flush toilets installed in treatment plant for a savings of 16 gal/toilet/day (Vickers, 2001). For 260 work days in a year, this will result in an annual savings of 24,440 gal/yr.
- A 1.0 gal/min bathroom aerator uses 1.5 gal/min less than an average bathroom faucet with a flow rate of 2.5 gal/min. For an average length of use of 8.1 min/person/work day (Vickers, 2001), an aerator saves 12.15 gal/person/day. For NTM's 4 sinks (assuming 5 people use each/workday on average), this would result in a total annual savings of 63,180 gallons.
- A 1.5 gal/min kitchen aerator uses 1.0 gal/min less than an average kitchen faucet with a flow rate of 2.5 gal/min. For an average length of use of 8.1 min/person/workday (Vickers, 2001) an Attachment B Water Conservation Savings Details North Table Mountain Water and Sanitation District 2009 – 2015 Water Conservation Plan Page B-3 aerator saves 8.1 gal/person/day. For NTM's 2 kitchen aerators (assuming 10 people use each/workday on average), this would result in a total annual savings of 42,120 gallons. The 2.0 gal/min showerhead uses 2.0 gal/min less than an average showerhead with a flow rate of 4.0 gal/min. For an average shower length of 8 minutes (Aquacraft, 2006) the low flow showerhead uses 16 gallons less. Assuming NTM's shower two showers are each used once a week, this would result in a total annual savings of 1,664 gallons.
- Total annual savings resulting from NTM's retrofit are 131,404 gallons.

APPENDICES

Outdoor Watering Schedule

This project is a component of the "Waste of Water Regulations". An evaluation of gallons used outdoors for each residence over the 2000 through 2007 period shows that outdoor use has decreased on average. 2006 through 2007 average outdoor use per residential account was 83,086 gal/yr while 2000 outdoor use was 87,923 gallons. The difference in outdoor residential water use between 2000 and the 2006/2007 average shows an annual savings in outdoor use of 4,836 gal/home. For 3,662 residential accounts (2009) this results in an annual savings of 17,709,432 gallons. While all of these savings in outdoor water use are attributed to NTM's outdoor watering schedule for accounting purposes in this Plan, the decrease is likely due to a variety of influences including public education. The following is the estimated savings during the 2009-2015 time period:

Year	Accounts	Gal/year
2009	3,662	17,709,432
2010	3,671	17,752,956
2011	3,683	17,810,988
2012	3,772	18,241,392
2013	3,813	18,439,668
2014	3,903	18,874,908
2015	3,968	19,189,248

Raw Water Irrigation

This program decreases demands on treated water but does not decrease overall water use.

Fire Hydrant replacement Program

The result of the 2011 sonic leak detection pilot project was 13 fire hydrants were found to be leaking. They were all one particular brand that are outdated. The District plans on replacing all 75 of them in the system. To date 13 Fire Hydrants have been replaced, saving 1 gpm = 500,000 gal per hydrant/year. Below is a table of the number of annual fire hydrant replacements:

Year	Number of Hydrants Replaced	Gallons Saved
2012	2	1,000,000
2013	3	1,500,000
2014	2	1,000,000
2015	5	2,500,000

New Development Soil Amendment Regulation

Properly amended soil is considered a key component to ensuring healthy landscapes and decreasing irrigation water needs. GreenCO's Executive Director has stated that soil amendments are key to outdoor water conservation (GreenCO, personal communication with Headwaters). However water savings resulting from soil amendments have not been well established. According to Denver Water (Denver Water, 2008), soil amendments applied in conjunction with applying low-water plants and trees and customer education, can decrease outdoor water use by 30 to 40 percent. According to the CSU Extension Service (CSU, 2007) "Proper irrigation practices can lead to a 30 to 80 percent water savings around the home grounds." This Plan estimates a 20% decrease in outdoor residential use for new developments resulting from the soil amendment regulation. This is an average savings of 16,617 gal/yr/residence. Applying this to the number of new residents for each year results in the total annual savings of the following:

Year	New Accounts	Gal/year
2010	9	149,553
2011	12	199,404
2012	89	1,478,913
2013	41	681,297
2014	90	1,495,530
2015	65	1,080,105

New development common area savings resulting from soil amendments are included under "New Development Public Area Landscape Regulations" so common areas are not included in the savings presented here. These calculations only consider residential lots. The savings estimates are conservative because additional savings occurred as a result of commercial and industrial customers' irrigated areas.

APPENDICES

New Development Public Area Landscape Regulations

The 2009 Plan showed that existing HOAs in NTM's service area found that average water use is 23.2 gal/ft2/yr for irrigated public areas. NTM developed and implemented landscape regulations for public area landscaping. The primary goal limited landscaping to 15 gal/ft2/yr. The savings resulted in a savings of 8.2 gal/ft2/year.

The following is a summary of the water savings for new development in the District:

Year	Acres	SF	Gal/year
2013	5	217800	1,785,960
2014	4	174240	1,428,768
2015	5	217800	1,785,960

Irrigation Audit Pilot Program (1 year pilot)

21 residential and 5 large (4 HOA and 1 park) audits were be completed. According to the CSU Extension Service (CSU, 2007) "Proper irrigation practices can lead to a 30 to 80 percent water savings around the home grounds." If each audited residence decreases their (2006 -2007 average) outdoor water use by just 10%, based upon average residential outdoor use, that will result in an annual savings of 8,309 gal/household. For 5 participants, this totals 41,543 gal/year water savings. Actual residential savings may be higher because customers using the most outdoor use will be targeted for audits. On average HOA irrigation accounts use 1,326,000 gallons/account/year (2006 – 2007 average). If audited accounts decrease their total water use by 10%, this would result in an annual savings of 132,572 gallons. For 5 audits, the total savings would be 662,858 gallons. NTM believes this is a reasonable estimate knowing that several HOAs have been concerned about their water use and are interested in improving their systems.

Water Efficient Landscaping and Irrigation Educational Materials

It is difficult to quantify water savings resulting from this educational program. Estimated savings from this program are included in "Additional Plan Savings".

Existing Industrial Customer Efforts

Existing industrial customer water conservation efforts save an estimated total of 111,630,333 gallons per year based upon historical metered water use data.

Water Treatment Plant Backwash and Wastewater Reuse

Backwash and reuse water is metered. Historically water recycled by the District has been around 11.4% of total water delivered. The total metered recycled wastewater was 569,160,000 gallons from 2009-2015.

Meter Replacement Program

It is difficult to quantify water savings resulting from this program at the present time. Estimated savings from this program are included in “Additional Plan Savings”.

System Maintenance, Leak Detection and Repair

It is difficult to quantify water savings resulting from this program at the present time. Estimated savings from this program are included in “Additional Plan Savings”.

Individual Account Leak Detection Program

It is difficult to quantify water savings resulting from this program at the present time. Estimated savings from this program are included in “Additional Plan Savings”.

Systemwide Water Audit

It is difficult to quantify water savings resulting from this program at this time. Additional data collection will help with this in the future. A portion of potential savings are included under the “Expanded Leak Detection Program”.

High Water Use Customer Assistance

It is difficult to quantify water savings resulting from this program at this time. Estimated savings from this program are included in “Additional Plan Savings”.

Increased Water Conservation and Water Use Education

It is difficult to quantify water savings resulting from this program. Estimated savings from this program are included in “Additional Plan Savings”.

Educational Water Bills

It is difficult to quantify water savings resulting from this program. Estimated savings from this program are included in “Additional Plan Savings”.

Water Meter Monitor Loan Program

Water meter monitors are used primarily by residential customers. Customers who borrow the monitor are likely to be somewhat interested in learning about and making modifications to their behavior and/or indoor fixtures and appliances and/or outdoor water use. Assuming total household water use is decreased by 3% by these customers, this will result in an annual savings of 4,148 gallons. They number of customers that borrowed a meter were recorded annually and the total use is summarized below:

Year	Borrowed Meters	Gal/year
2010	9	37,332
2011	8	33,184
2012	12	49,776
2013	14	58,072
2014	7	29,036
2015	10	41,480

2008 Tiered Rate Structure Modifications and Annual Evaluation

It is difficult to quantify water savings resulting from this program at this time. Estimated savings from this program are included in “Additional Plan Savings”.

Monthly Billing for Park and HOA Accounts

It is difficult to quantify water savings resulting from this program at this time. Estimated savings from this program are included in “Additional Plan Savings”.

Waste of Water Regulations

It is difficult to quantify water savings resulting from this program. A portion of savings is estimated in this section under “Outdoor Watering Schedule”. Additional estimated savings from this
program are included in “Additional Plan Savings”.

Association Memberships

It is difficult to quantify water savings resulting from this program. Estimated savings from this program are included in “Additional Plan Savings”.

Drought Mitigation Measures

Overall systemwide savings resulting from drought mitigation measures can be quantified. However these are invoked only during periods of drought and are not ongoing savings resulting from NTM's water conservation programs so are not included in this Plan.

Collaborative Water Conservation Relationships

It is difficult to quantify water savings resulting from this program. Estimated savings from this program are included in "Addition Savings"

APPENDIX C

Water Savings Result Estimates for Implemented 2016-2021 Programs

Free Water Conservation Kits

- NTM's conservation kits include 1 toilet displacement bag, 1 shower and 1 faucet restrictor, and toilet leak detection dye tablets. This District assumes that 40 kits will used by customers annually.
- Each toilet bag displaces 0.5 gallons. Assuming an average of 5.1 flushes/person/day (Vickers, 2001) and 2.53 people/home, this results in a savings of 2,354 gal/home/yr. For 40 bags, the total annual savings will be 94,191 gallons.
- Shower restrictors decrease maximum flow to 2.5 gal/min. Assuming 4 gal/min was being used before restrictor was installed, for one 8 minute shower/person/day (Aquacraft, 2006) this saves 12 gallons. For 2.53 people per home, 40 kits would result in a total annual savings of 443,256 gallons.
- Sink restrictors decrease maximum flow to 1.5 gal/min. Assuming 2.5 gal/min was being used before restrictor was installed, for 8.1 min/person/day (Vickers, 2001), this results in a savings of 8.1 gal/person/day. For 2.53 people/home, 40 kits would result in a total annual savings of 299,197 gallons.
- Toilet dye tablets: Assuming 5% of toilets in U.S. homes leak and that the average leaks 180 gal/day (estimated based upon data provided in Vickers, 2001), two toilets can be checked with each kit so 4 of the 100 toilets tested are estimated to leak. Assuming these are fixed, this would result in an annual savings of 262,800 gallons.
- Total annual savings resulting from 40 kits (assuming only 5% of toilets tested need to be fixed for leaks) is 1,101,798 gallons.

Outdoor Watering Schedule

As described under the "Outdoor Watering Schedule" section in ***Appendix B***; 4836 gallons per home can be assumed for Outdoor Watering Schedule water use savings. This project is a component of the "Waste of Water Regulations". For 4600 residential accounts (2020) this results in an annual savings of 22,245,600 gallons. While all of these savings in outdoor water use are attributed to NTM's outdoor watering schedule for accounting purposes in this Plan, the decrease is likely due to a variety of influences including public education.

Raw Water Irrigation

This program decreases demands on treated water but does not decrease overall water use.

Fire Hydrant replacement Program

The result of the 2011 sonic leak detection pilot project was 13 fire hydrants were found to be leaking. They were all one particular brand that are outdated. The District has began replacing all 75 of them in the system. A leaking fire hydrant is estimated to leak at 1 gpm = 500,000 gal per hydrant/year. Assuming 6 hydrants per year are replaced = 3 MG/ year water savings

APPENDICES

New Development Soil Amendment Regulation

Properly amended soil is considered a key component to ensuring healthy landscapes and decreasing irrigation water needs. GreenCO's Executive Director has stated that soil amendments are key to outdoor water conservation (GreenCO, personal communication with Headwaters, NTM Consultant).

However water savings resulting from soil amendments have not been well established. According to Denver Water (Denver Water, 2008), soil amendments applied in conjunction with applying low-water plants and trees and customer education, can decrease outdoor water use by 30 to 40 percent. According to the CSU Extension Service (CSU, 2007) "Proper irrigation practices can lead to a 30 to 80 percent water savings around the home grounds." This Plan estimates a 20% decrease in outdoor residential use for new development resulting from the soil amendment regulation. This is an average savings of 16,617 gal/yr/residence. Applying this to the 301 new residential accounts expected in 2016, this would result in a total annual savings of 5,001,717 gallons. New development common area savings resulting from soil amendments are included under "New Development Public Area Landscape Regulations" below so are not included in the savings presented here. These calculations only consider residential lots. Additional savings are likely to been as a result of commercial and industrial customers' New development common area savings resulting from soil amendments are included under "New Development Public Area Landscape Regulations" so common areas are not included in the savings presented here. These calculations only consider residential lots. The savings estimates are conservative because additional savings occurred as a result of commercial and industrial customers' irrigated areas.

New Development Public Area Landscape Regulations

Jefferson County Land Development Regulations require that 10.5 acres be set aside for parks – including HOA common areas - for every 1,000 people (Jeffco, 2005). If it is assumed that 60% of park areas are irrigated, this results in a requirement of 6.3 acres of irrigated park area for every 1,000 people. The 2009 Plan showed that existing HOAs in NTM's service area found that average water use is 23.2 gal/ft2/yr for irrigated public areas. NTM developed and implemented landscape regulations for public area landscaping. The primary goal limited landscaping to 15 gal/ft2/yr. The savings resulted in a savings of 8.2 gal/ft2/year. Assuming an increase this would result in an additional 4.3 acres of parks,2.6 acres (or 112,241 ft2) of which would be irrigated (assuming 60% of park area is irrigated).Applying a savings of 8.2 gal/ft2 to this area would result in an annual savings of 920,376 gallons

Irrigation Audit Pilot Program (1 year pilot)

According to the CSU Extension Service (CSU, 2007) "Proper irrigation practices can lead to a 30 to 80 percent water savings around the home grounds." If each audited residence decreases their (2006 -2007 average) outdoor water use by just 10%, based upon average residential outdoor use, that will result in an annual savings of 8,309 gal/household. For 5 participants, this totals 41,543 gal/year water savings. Actual residential savings may be higher because customers using the most outdoor use will be targeted for audits.

APPENDICES

Annual Landscape and Irrigation System Seminar

It is difficult to quantify water savings resulting from this program. If it is assumed that each participant decreases their outdoor water use by 10% as a result of attending the seminar (based upon 2006-2007 average outdoor use of 83,086 gal/home) that will result in an annual savings of 8,309 gal/household. For 10 participants annually, this totals 83,086 gal/year water savings. The 10% estimate is believed to be realistic in that participants who are interested enough to attend the seminar will make water savings modifications to their landscaping, irrigation systems and scheduling. Actual savings could be up to 30 – 80% according to the CSU Extension Service (CSU, 2007).

Water Efficient Landscaping and Irrigation Educational Materials

It is difficult to quantify water savings resulting from this educational program. Estimated savings from this program are included in "Additional Plan Savings".

Existing Industrial Customer Efforts

Existing industrial customer water conservation efforts save an estimated total of 111,630,333 gallons per year based upon historical metered water use data.

Water Treatment Plant Backwash and Wastewater Reuse

Backwash and reuse water is metered. Historically water recycled by the District has been around 11.4% of total water delivered. The total metered recycled wastewater was 569,160,000 gallons from 2009-2015 or 81,308,571 annually.

Meter Replacement Program

It is difficult to quantify water savings resulting from this program at the present time. Estimated savings from this program are included in "Additional Plan Savings".

System Maintenance, Leak Detection and Repair

It is difficult to quantify water savings resulting from this program at the present time. Estimated savings from this program are included in "Additional Plan Savings".

Individual Account Leak Detection Program

It is difficult to quantify water savings resulting from this program at the present time. Estimated savings from this program are included in "Additional Plan Savings".

APPENDICES

Water Loss Audit

It is difficult to quantify water savings resulting from this program at this time. Additional data collection will help with this in the future. A portion of potential savings are included under the "Expanded Leak Detection Program".

High Water Use Customer Assistance

It is difficult to quantify water savings resulting from this program at this time. Estimated savings from this program are included in "Additional Plan Savings".

Increased Water Conservation and Water Use Education

It is difficult to quantify water savings resulting from this program. Estimated savings from this program are included in "Additional Plan Savings".

Educational Water Bills

It is difficult to quantify water savings resulting from this program. Estimated savings from this program are included in "Additional Plan Savings".

Water Meter Monitor Loan Program

Water meter monitors are used primarily by residential customers. Customers who borrow the monitor are likely to be somewhat interested in learning about and making modifications to their behavior and/or indoor fixtures and appliances and/or outdoor water use. Assuming total household water use is decreased by 3% by these customers, this will result in an annual savings of 4,148 gallons. If 10 customers borrow the meter annually, this would equal a water savings of 41,480 gal/yr.

2008 Tiered Rate Structure Modifications and Annual Evaluation

It is difficult to quantify water savings resulting from this program at this time. Estimated savings from this program are included in "Additional Plan Savings".

Monthly Billing for Park and HOA Accounts

It is difficult to quantify water savings resulting from this program at this time. Estimated savings from this program are included in "Additional Plan Savings".

Waste of Water Regulations

It is difficult to quantify water savings resulting from this program. A portion of savings is estimated above under "Outdoor Watering Schedule". Additional estimated savings from this program are included in "Additional Plan Savings".

APPENDICES

Association Memberships

It is difficult to quantify water savings resulting from this program. Estimated savings from this program are included in “Additional Plan Savings”.

Drought Mitigation Measures

Overall systemwide savings resulting from drought mitigation measures can be quantified. However these are invoked only during periods of drought and are not ongoing savings resulting from NTM’s water conservation programs so are not included in this Plan.

Collaborative Water Conservation Relationships

It is difficult to quantify water savings resulting from this program. Estimated savings from this program are included in “Additional Plan Savings”

APPENDIX D

Board of Directors
30 Day Comment Period

RECORD OF PROCEEDINGS
February 12, 2008

The Board of Directors met at the District office, February 12, 2008, at 6:00 p.m. Present were Board Members Paula Corbin, Michael Ellis, Kathryn Jensen, William Karlin, Phil Wathier, District Engineer/Manager Rick Jeschke, Assistant Manager Bart Sperry, and Attorney Rick Fendel. Paula Corbin moved to approve the minutes of January 22, 2008, and the District Operations Report of February 8, 2008. Michael Ellis seconded, motion passed.

ANNEXATION PUBLIC HEARING - There was no public input to the annexation of CDOT property at 44th Avenue and Zang Street. Michael Ellis moved to approve the Inclusion of Property agreement as presented. Phil Wathier seconded, motion passed.

WATER CONSERVATION PLAN 30 DAY REVIEW - Phil Wathier moved to approve the resolution to abbreviate the 90-day public comment period for the water conservation plan to 30-days as presented. Paula Corbin seconded, motion passed.

ELECTION - The Board engaged in general discussion regarding the 2008 election for Board members.

OFFICE REMODEL - Michael Ellis moved to accept the bid of $42,738 from CG Construction Inc. for the office remodel. William Karlin seconded, motion passed. William Karlin moved to approve the expenditure of up to $30,000 for District staff to complete the office remodel for furniture, cabinets, shelves, HVAC, and other necessary items. Phil Wathier seconded, motion passed.

BILLS - The following bills were presented for approval:

Customer billing information has been removed for privacy reasons.

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE NORTH TABLE MOUNTAIN WATER AND SANITATION DISTRICT ESTABLISHING A PUBLIC HEARING PROCESS FOR MAITERS INVOLVING ADOPTION OF WATER CONSERVATION AND OTHER WATER
PLANS

WHEREAS, the Board of Directors of the North Table Mountain Water and Sanitation District desires to adopt a public hearing process which will appropriately consider the water conservation plan so that reasonable opportunities will be available for receipt and consideration of public comment.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE NORTH TABLE MOUNTAIN WATER AND SANITATION DISTRICT, AS FOLLOWS:

Section 1. In all matters involving the creation, adoption and/or implementation of a water conservation plan, the staff of the District is directed to post a copy, and to place a notice of any scheduled public hearing on such plan, on the Districts' website no less than 30 days prior to the date of such scheduled public hearing.

Section 2. During the 30 day notice period identified in Section 1 of this Resolution, the District shall maintain a copy of the proposed plan in the District office available for review by any member of the general public during regular District business hours.

Section 3. Any property owner or resident of the North Table Mountain Water and Sanitation District may submit written comments relating to the proposed plan during the 30 day review period. In addition, any such resident or owner may appear at the scheduled public hearing and provide verbal comments relating to such plan.

Section 4. Any written or verbal comments received either within the 30 day notice period or at the public hearing shall be considered by the Board of Directors in making its decision as to adoption of such proposed plan.

Customer billing information has been removed for privacy reasons.

Paula Corbin moved to approve the bills. Phil Wathier seconded, motion passed.

Meeting was adjourned at 6:38 p.m.

APPROVED

Paula Corbin

Kathryn Jensen

Michael D Ellis

Respectfully submitted,

APPENDIX E

Notice of Public Review Period
Comments Received
Responses

Proof of Publication
THE GOLDEN TRANSCRIPT

722 Washington Ave., Unit 210, Golden, CO 80401

1. I, Gerard J. Healey am the agent of The Golden Transcript, newspaper printed and published in the city of Golden, County of Jefferson and State of Colorado, and has personal knowledge of all the facts set forth in this affidavit;

2. That the said newspaper is printed and published once each week on Thursday, and that it has a general circulation in the City of Golden and in the County of Jefferson and elsewhere, delivered by carriers or transmitted by mail to each of the subscribers of said paper, according to the accustomed mode of business in this office;

3. That the said newspaper was established and has been printed and published in the said City of Golden and the County of Jefferson uninterrupted and continuously during a period of at least 52 consecutive weeks next prior to the first Issue there-of containing said publication, a copy of which is hereto attached;

4. That the said newspaper is a weekly newspaper of general circulation, and is printed and published in whole or in part in the City of Golden and the said County of Jefferson in which said publication is required by law to be published, a copy of which is hereunto attached;

5. That the said newspaper is a weekly newspaper qualified to publish legal notices, as defined by the Statutes of the State of Colorado;

6. That said newspaper had, prior to January 1, 1936, and has ever since that date, been admitted to the United States mail as second class matter under the provisions of the Act of March 3, 1979, or any amendments thereto;

7. That the said annexed publication was published in the regular and entire edition of the Golden Transcript, a duly qualified weekly newspaper for that purpose, within the terms and means of the Statutes of the State of Colorado;

8. That the said annexed publication is a full, true, and correct copy of the original which was regularly published in each of the regular and entire issues of the Golden Transcript, a legally qualified paper for that purpose, once each week, on the same day of each week, for **1** weeks, by **1** Insertions, and that the first publication thereof was in the **January 19, 2017**; and that the last publication was in the **January 19, 2017**.

Public Notice

North Table Mountain Water and Sanitation District has developed a draft 2016-2022 Water Conservation Plan. The Plan includes a variety of conservation programs for its customers and encourages public input. **Comments period open from January 30th to March 3rd.**

The plan can be found on the District website at www.ntmwater.org or can be viewed at 14806 w 52nd Avenue, Golden Colorado 80403.

Legal Notice No.: 46530
First Publication: January 19, 2017
Last Publication: January 19, 2017
Publisher: Golden Transcript

For the Golden Transcript

State of Colorado }
County of Douglas } ss

The above Affidavit and Certificate of Publication was subscribed and sworn to before by the above named Gerard Healey, publisher of said newspaper, who is personally known to me to be the identical person in the above certificate on the **19th** day of **January** A.D., 2017. Gerard Healey has verified to me that he has adopted an electronic signature to function as his signature on this document.

Heather L. Crompton
Notary Public
My commission ends December 18, 2019

HEATHER L. CROMPTON
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20154048391
Commission expiration date:
December 18, 2019

NORTH TABLE MOUNTAIN WATER AND SANITATION DISTRICT
14806 WEST 52ND AVENUE. GOLDEN. COLORADO 80403-1228

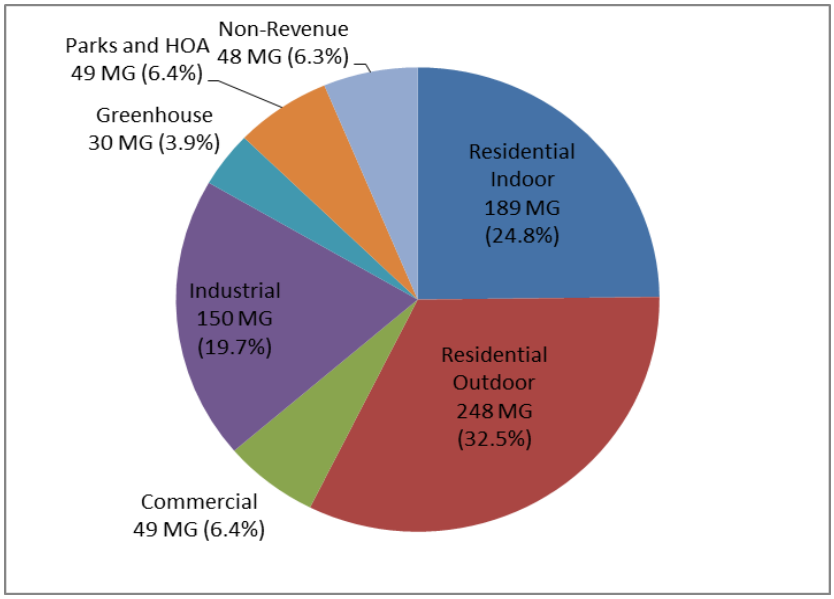
North Table Mountain Report – February 2017

www.NTMWater.org

Water Efficiency Plan

Water providers who annually supply over 650 million gallons of water to retail customers each year are required to submit a Water Efficiency Plan (Plan) to the State Office of Water Conservation. Colorado's population is expected to grow to 7.9 million by 2040, a 46% increase from the 2014 population estimate of 5.4 million. Most of the state's growth is expected to occur along the Front Range. This is leading to increased concerns about the availability of water supplies as well as costs. Water conservation is extremely important to preserve our water supply. NTM recognizes that a well-developed Plan will help manage current demands and ensure the long-term adequacy of our water supply.

2015 Water Use



Note: "Non-Revenue" water includes water lost to leaks, system flushing, sampling, new water main construction activities, evaporation at the treatment plant, etc. The national accepted average is about 12%.

We would like to hear from you regarding our Plan. A draft of the Plan will be available for review at NTM's office throughout the month of February and will be posted at www.ntmwater.org. Please share your ideas now, if you would like, by e-mailing us at conservation@ntmwater.org or leaving a message at 303-279-2854 ext. 333.

The Plan will evaluate the following programs:

- Water efficient fixtures and appliances (toilets, showerheads, faucets, etc.);
- Water efficient landscaping and irrigation systems;
- Distribution system leak identification and repair;
- Education materials;
- Rate structures and billing systems designed to encourage wise water use;
- Regulations designed to encourage water conservation.

NORTH TABLE MOUNTAIN WATER AND SANITATION DISTRICT
14806 WEST 52ND AVENUE. GOLDEN. COLORADO 80403-1228

North Table Mountain Report – March 2017

www.NTMWater.org

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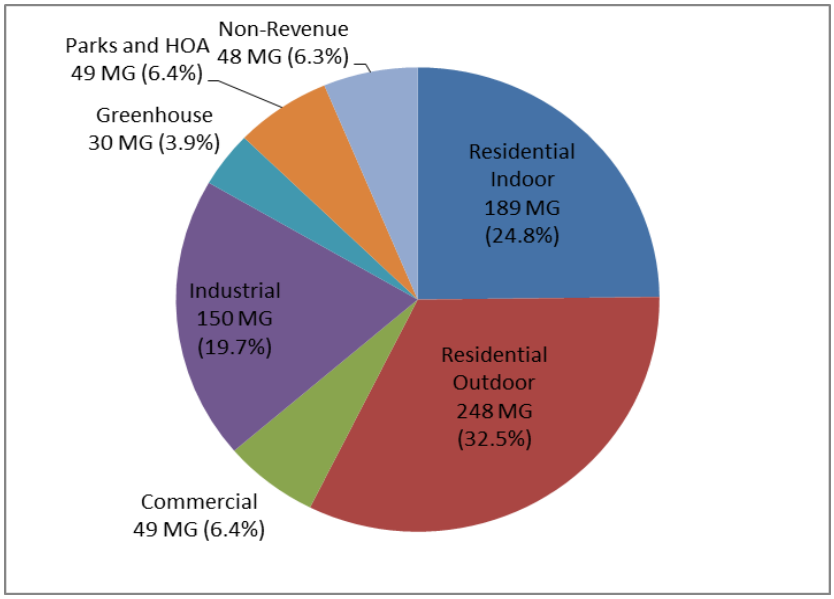

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- Regulations designed to encourage water conservation.

APPENDICES

THE FOLLOWING COMMENTS WERE RECEIVED DURING THE PUBLIC REVIEW PERIOD

From: Richard Case,
rkcase19158@gmail.com,
(303) 670-1345

I used to live in a retirement condo. Our water bill went up every year even though our water rates did not change. So, I started a program, with management approval, to check the toilets in all the condos. I found that over 1/3 of them were leaking water; a few at full stream. The residences did not know or, in some cases, care very much.
We replaced the faulty flappers, for free, as required.
We gave the residence little dye packets so that after the flapper valves were replaced they could check for toilet water leaks. It helped. As strangely as it might seem, some of the older residences thought that if the water in their toilet bowl turned blue the value was working.
Numerous times I have found leaky flapper valves when I use the restrooms in restaurants.
So maybe a program where NTMWater mails dye packets to all their water users with instructions as to how to use them. And maybe free replacement flapper valves? And maybe even free or a small fee to replace them??

NTM Response

Thank you very much for your response. The program that you started at the retirement condo sounds very successful and NTM appreciates you sharing the results of that program with us. Currently NTM offers free dye packets to customers that are available for pick-up in our office. Due to your e-mail and the positive results that you achieved; we will look at ways to accommodate more customers with the dye tablets and educate them on water savings by preventing leaking toilets.

Again we appreciate and value your input.

From: Mike Hanson
District Manager
Prospect Recreation & Park District

Wendy,

Thank you for the opportunity to comment on North Table Mountain Water and Sanitation District's (NTM) 2016-2022 Water Conservation (Efficiency) Plan. NTM is to be commended for being forward thinking and comprehensive in its approach to planning for future water needs in its service area.

Prospect Recreation & Park District (PRPD), as a customer of NTM, appreciates the working relationship between the two agencies that allows for collaboration and dialogue. PRPD's comments to the Plan are very general. Given that the population numbers in NTM's service area have been increasing and will continue to increase, NTM appears to be well positioned in regards to both current and future water supply capability, infrastructure, and organizational staffing. Further, NTM has outlined specific capital improvement projects that will allow for increased service capacity and efficiencies over time. The continued emphasis on methods to continue and increase water conservation is a strong component of the plan, and reflects NTM's commitment to this aspect of their provision of service.

Please let me know if you have any questions or if you need further information.

NTM Response

Good morning Mike,

North Table Mountain Water and Sanitation District's (NTM) thanks you and Prospect Recreation & Park District (PRPD) for your review of NTM's 2016-2022 Water Efficiency Plan. Your input is important and we appreciate your support of the plan and our attempt to ensure that customers in our service area use water efficiently and wisely.

NTM very much appreciates the collaborative relationship between NTM and PRPD. We look forward to working with you on water efficiency and other projects in the future.

APPENDIX F

Board of Directors Resolution Adopting Plan

RESOLUTION

RESOLUTION OF THE NORTH TABLE MOUNTAIN WATER AND SANITATION DISTRICT ADOPTING A WATER EFFICIENCY PLAN

WHEREAS, pursuant to the laws of the Colorado Revised Statue (CRS) 37-60-124, and CRS 37-60-126 the District has prepared a Water Efficiency Plan (Plan); and

WHEREAS, a notice was published announcing the availability of the Plan for public review and comment period in compliance with the above Colorado Revised Statues.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors of the North Table Mountain Water and Sanitation District hereby adopts the Plan as written and herein incorporated as Attachment "A"

Passed and adopted at a regular meeting of the Board of Directors of the North Table Mountain Water and Sanitation District this 14th day of March, 2017

By: Paula Corbin

Paula Corbin, President

Attest: Jamie Miller

Jamie Miller, Secretary

REFERENCES

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