



Copper Mountain Consolidated Metropolitan District WATER EFFICIENCY PLAN

January 2018





Table of Contents

1	Executive Summary.....	1
1.1	Where We Are Now.....	1
1.2	Where We Want to Go.....	2
1.3	How We Will Get There.....	2
1.4	How We Will Stay on Track.....	3
2	Acknowledgements.....	5
3	Introduction.....	6
3.1	Why a water efficiency plan?.....	6
3.2	The Planning Process.....	6
3.3	Our Water Vision.....	7
4	Service Area Characteristics.....	8
4.1	Boundaries.....	8
4.2	Population.....	8
4.3	Residential Sector.....	9
4.4	Commercial and Industrial Sector.....	9
5	Existing Water and Wastewater System.....	10
5.1	Raw Water Supplies.....	10
5.2	Treatment and Distribution.....	11
5.3	Water Distribution and Non-Revenue Water Uses.....	11
5.4	Wastewater Collection and Treatment.....	11
5.5	Water and Sanitation Rates.....	11
5.6	System Reliability, Limitations, and Future Needs.....	12
6	Historical Water Demands and Demand Management.....	14
6.1	Historical Water Demands.....	14
6.2	Past and Current Demand Management Activities.....	17
7	Water Efficiency Goals and Demand Forecasts.....	19
8	Selection of Water Efficiency Activities.....	21
8.1	Foundational Activities.....	21
8.2	Targeted Technical Assistance and Incentives.....	22
8.3	Ordinances and Regulations.....	23
8.4	Educational Activities.....	23
9	Implementation and Monitoring Plans.....	24



9.1	Implementation	24
9.2	Plan Review, Monitoring, and Updates.....	25
	References.....	26
	Appendix A: Plan Data.....	27
	Appendix B: Implementation Resources.....	28
	Appendix C: Implementation Action Plans.....	29
	Education and Outreach	29
	Indoor Water Use Efficiency.....	31
	Integrated Water and Land Use Planning	33
	Outdoor Water Use Efficiency	35
	Appendix D: Resolution to Adopt Plan.....	37

List of Tables

Table 1: Summary of Raw Groundwater Supplies.....	10
Table 2: 2017-2018 Combined Water and Sanitation Rates (District 2017).....	12
Table 3. Summary of Planned Water Efficiency Activities.....	21
Table 4. Annual Implementation Costs	25

List of Figures

Figure 1. State of Colorado Municipal Water Efficiency Plan Guidance Document	7
Figure 2: District Service Area (Map data © 2017 Google).....	8
Figure 3. Annual Treated Water Production (2011-2016).....	14
Figure 4: Average Monthly Water Production (2011-2016)	15
Figure 5. Annual Non-Revenue Water (2013-2016).....	16
Figure 6. System-wide Per Capita Water Demands (2011-2016).....	16
Figure 7: Projected Annual Water Production Volumes (through 2025).....	19

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1 EXECUTIVE SUMMARY

In 2017, High Country Conservation Center and five water providers in Summit County (Copper Mountain Consolidated Metropolitan District, Town of Breckenridge, Town of Dillon, Town of Frisco, and Town of Silverthorne) partnered together for the development of water efficiency plans. A diverse stakeholder group developed a vision statement to guide efforts in the Blue River Watershed towards regional water efficiency:

Our vision is for water providers to continue supplying reliable, high quality water to the residents and visitors of Summit County while also:

- *Protecting the natural environment upon which our economy and prosperity are based.*
- *Ensuring the sustainability of our mountain lifestyle for current and future generations.*
- *Fostering a culture of environmental and social responsibility through education and actions.*
- *Inspiring collaboration and responsible stewardship of water resources across the State of Colorado.*

This water efficiency plan is the first that has been developed for the District, and documents existing and planned actions to ensure system reliability and the efficient use of available water.

1.1 WHERE WE ARE NOW

The District receives its water supplies from three groundwater wells that pump from the West Ten Mile Aquifer. The District anticipates that buildout water demands will exceed current water rights. Water conservation efforts are one mechanism to help the District manage demands and minimize expenditures associated with additional water rights and infrastructure.

The District provides retail water to residential and commercial customers, and wholesale water to contractors that serve the Copper Mountain ski resort. Non-revenue water uses include hydrant flushing, system leaks, and water used for firefighting. Annual non-revenue water estimates, expressed as a percentage of production volumes, have varied widely from 6-28% since 2013. The District suspects that variability in non-revenue water estimates may be partially explained by gaps in historical water usage data records. The District is currently developing better methods for data management and analysis, including consolidating historical data.

The District experiences two periods of high water demands throughout the year: in winter (due to ski-related tourism) and in summer (due to tourism and outdoor water use). Outdoor water use represents a relatively small percentage (14%) of total annual demands.

Since 2011, the District has seen an average increase of 3.4% year-over-year in annual water production volumes, with 332 ac-ft in potable water production in 2016. When normalizing for fluctuations in population, including both the resident and visiting population, the District has seen variable, but slightly declining, system-wide per capita demands. In 2016, system-wide water use was 51 gallons per capita per day.



The District has implemented various demand management activities, including:

- Starting to implement advanced metering infrastructure in 2016
- Conducting annual system-wide leak inspections, starting in 2014
- Inclining block rates, adopted in 2015
- Structuring tap fees based on tap size and hydraulic capacity

1.2 WHERE WE WANT TO GO

This water efficiency plan was developed using a 2025 planning horizon, providing enough time to gain traction on new efficiency activities, and with an emphasis on successful implementation. Over the period 2018-2025, the District aims to implement additional efficiency activities to supplement existing activities to achieve the following goals:

- Annual water savings of 25 ac-ft/yr by the year 2025, compared to the business-as-usual forecast.
- Cumulative water savings of 160 ac-ft over the period 2018-2025 compared to the business-as-usual forecast.
- Reductions in peak demands during the summer associated with outdoor water use.
- Increased awareness by residents and visitors about the importance of water resources and water conservation.
- Reductions in water use to avoid drilling new water supply wells.

1.3 HOW WE WILL GET THERE

New efficiency activities were selected using multiple factors that included utility priorities, stakeholder input, opportunities for water savings, technical feasibility, and implementation capacity. When feasible, the efficiency activities were quantified in terms of their potential for water savings and implementation costs.

Water Efficiency Activity	Sectors Impacted	Implementation Period	Projected Water Savings in 2025
Foundational Activities			
Advanced Metering Infrastructure and Enhanced Water Loss Control	All Customers	2018-Ongoing	23 ac-ft/yr
Conservation-Oriented Rates	All Customers	2020-Ongoing	1.5 ac-ft/yr
Billing Upgrades	All Customers	2019-Ongoing	Not Quantified
Institutional Collaboration	Utility	2017-Ongoing	Not Quantified
Targeted Technical Assistance and Incentives			
Indoor Water Efficiency	Residential	2018-Ongoing	Not Quantified
Outdoor Water Efficiency	All Customers	2020-Ongoing	2 ac-ft/yr
Ordinances and Regulations			
Land Use Planning	All Customers	2017-Ongoing	Not Quantified
Education Activities			
Education and Outreach	All Customers	2018-Ongoing	Not Quantified
Total Annual Savings in 2025			26.5 ac-ft/year



The District will be responsible for the implementation of the foundational activities (billing upgrades, advanced metering infrastructure and enhanced water loss control, and conservation-oriented rates). The following table summarizes annual costs based on the implementation schedule presented in this plan. Implementation costs will be funded primarily through the District’s operating budget, although external funding sources will also be evaluated.

Year	Advanced Metering Infrastructure and Enhanced Water Loss Control	Conservation-Oriented Rates	Billing Upgrades	Total
2018	\$70,000	-	-	\$70,000
2019	\$70,000	-	\$2,500	\$72,500
2020	\$70,000	\$20,000	\$2,500	\$92,500
2021	\$70,000	-	\$2,500	\$72,500
2022	\$70,000	-	\$2,500	\$72,500
2023	-	-	\$2,500	\$2,500
2024	-	-	\$2,500	\$2,500
2025	-	-	\$2,500	\$2,500

1.4 HOW WE WILL STAY ON TRACK

This water efficiency plan includes implementation action plans for the planned water efficiency activities to help the District achieve its goals. The action plans specify goals, strategies, action items, timelines, and resources for each activity.





3 INTRODUCTION

The Copper Mountain Consolidated Metropolitan District (District) is a special district under Title 32 of the Colorado Revised Statutes and operates under the direction of a five-member Board of Directors. Formed in 1972, the District provides water, wastewater, and television services to Copper Mountain ski resort and associated areas. The District is also a member of Summit Fire and Emergency Services.

This water efficiency plan is the first that has been developed for the District. A related planning effort includes the District's long-range master plan, which was updated in 2013 and projects infrastructure needs out to system buildout.

3.1 WHY A WATER EFFICIENCY PLAN?

The Water Conservation Act of 2004 (HB04-1365) requires all covered entities, defined as retail water providers that sell more than 2,000 ac-ft/yr, to have a State-approved water efficiency plan. Although the District is well below this threshold, the District, along with neighboring water providers, looks to set an example for other mountain communities in preserving the natural environment and promoting conservation values. This water efficiency plan serves to describe the District's history of water saving activities and future plans. As a special district water provider with relatively limited staffing and financial resources, the District seeks to leverage regional partnerships to effect change and encourage all residents and visitors to reduce water use.

Additionally, in developing and adopting this water efficiency plan, the District will qualify for grant funding from the State of Colorado to support implementation of water efficiency programs. Regional partnerships developed through this process are already leading to increased opportunities for technical guidance through professional associations and training and education programs.

3.2 THE PLANNING PROCESS

In 2017, High Country Conservation Center, Middle Park Conservation District, and five water providers in Summit County (Copper Mountain Consolidated Metropolitan District, Town of Breckenridge, Town of Dillon, Town of Frisco, and Town of Silverthorne) convened a project for the development of a regional water efficiency plan. Water efficiency plans were also developed for four of the individual water providers (excluding Town of Silverthorne) to represent the unique needs and opportunities for each service area. The regional water efficiency plan, developed for the Blue River Watershed within Summit County, elevates common themes and water saving opportunities outside of the participating service areas, and provides opportunities for partnership and collaboration amongst the participating utilities. Plan development was supported through a combination of grant funding from the Colorado Water Conservation Board (CWCB) under the Water Conservation Planning grant program, and cash and in-kind contributions from the participating providers.



The water efficiency plans were developed in accordance with the State of Colorado's *Municipal Water Efficiency Plan Guidance Document* (CWCB 2012). The plans were drafted using information and guidance provided by utility and planning staff in each community. Additionally, a diverse stakeholder group was formed to provide input on water savings goals, water efficiency activities, and implementation actions. In 2017, more than 30 stakeholders participated in a series of four planning workshops (baseline review, draft goals and efficiency activities, revised goals and efficiency activities, and implementation). Upon completion, the plans underwent a series of reviews by utility staff, the stakeholder group, the public, and CWCB staff. Finally, plans were submitted to the appropriate governing entity (town council or District board, as appropriate) for adoption.

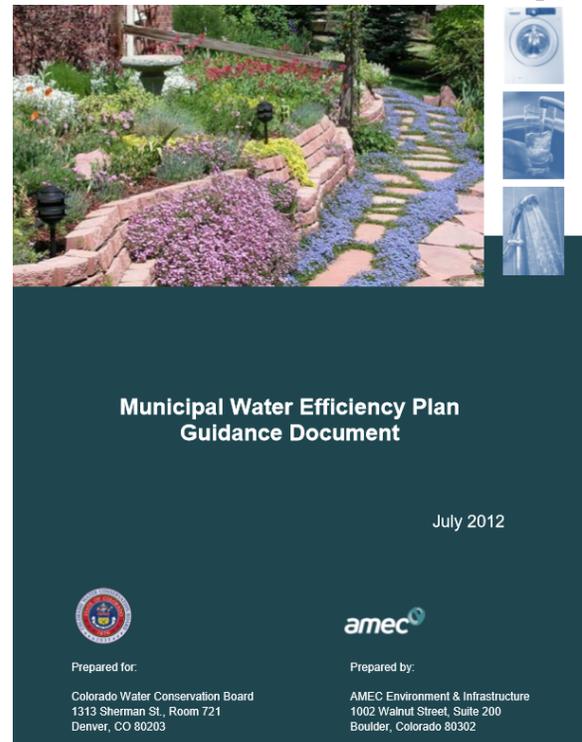


Figure 1. State of Colorado Municipal Water Efficiency Plan Guidance Document

3.3 OUR WATER VISION

The stakeholder group developed a vision statement to guide efforts in the Blue River Watershed towards regional water efficiency.

VISION STATEMENT

Our vision is for water providers to continue supplying reliable, high quality water to the residents and visitors of Summit County while also:

- Protecting the natural environment upon which our economy and prosperity are based.
- Ensuring the sustainability of our mountain lifestyle for current and future generations.
- Fostering a culture of environmental and social responsibility through education and actions.
- Inspiring collaboration and responsible stewardship of water resources across the State of Colorado.



4 SERVICE AREA CHARACTERISTICS

4.1 BOUNDARIES

The District provides water and wastewater services to an area that encompasses 1.8 sq mi at the base of Copper Mountain (**Figure 2**). Copper Mountain is a resort community in Summit County located 75 miles west of Denver, near the intersection of Interstate 70 and Colorado Highway 91. The area was once known as Wheeler Junction, a settlement founded in the 1880's as a home for miners. As with other areas in Summit County, when the mining claims dried up most of the settlements associated with them did as well. In 1971, Chuck Lewis decided to build a ski area. In 1972, the District was formed to address the needs of the citizens.

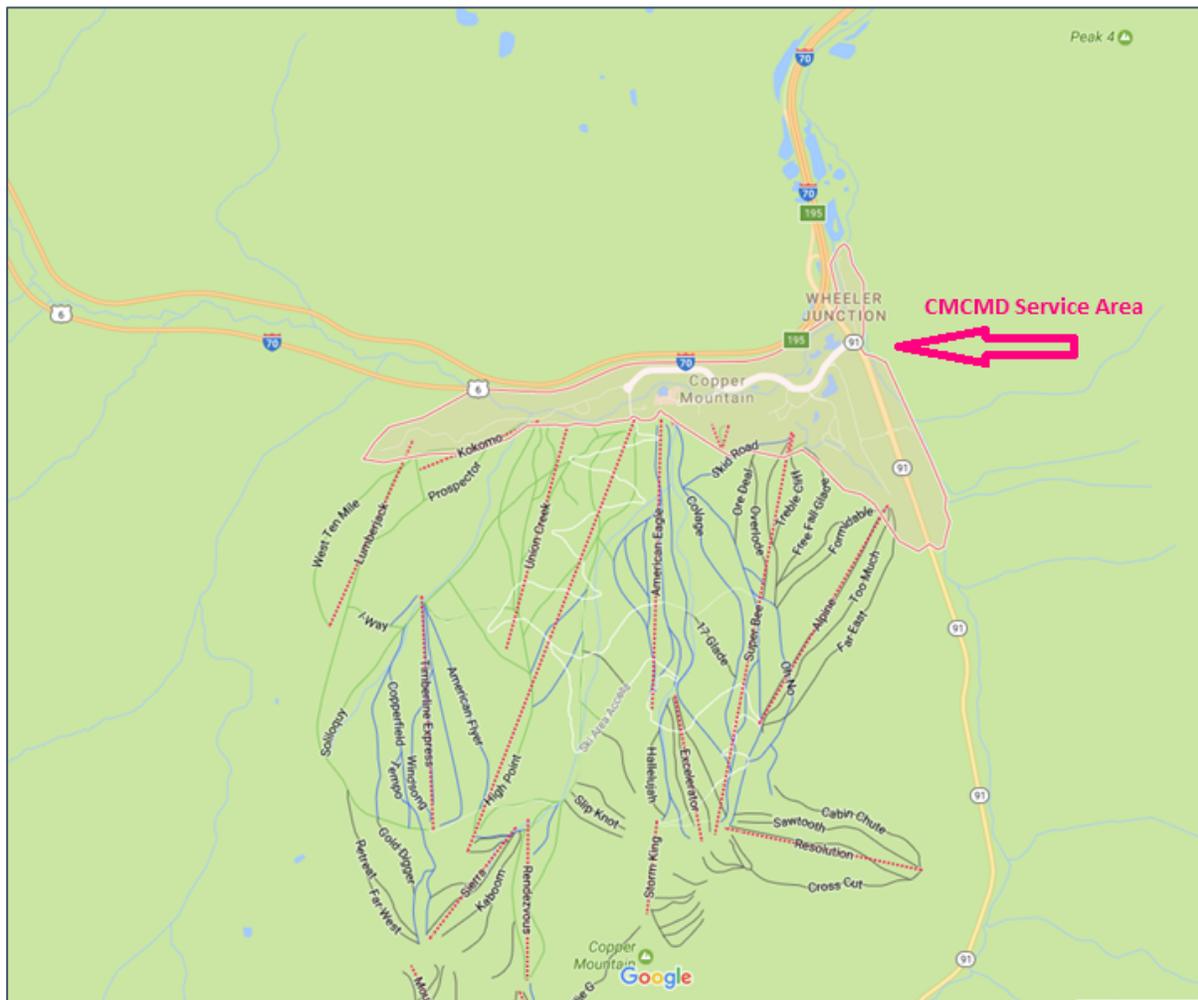


Figure 2: District Service Area (Map data © 2017 Google)

4.2 POPULATION

Copper Mountain is comprised almost entirely of the ski resort and associated amenities. Tourism introduces a high degree of seasonality and variability into the service population. In 2015, Copper Mountain had a population of 268 permanent residents (ACS 2015). However, the



District estimates that the annual average service population was 5,785, and that the daily peak service population was more than 14,000.

From 2011 to 2015, Copper Mountain experienced an 8% decline on average year-over-year in permanent resident population (from 385 to 268 residents; ACS 2015), but an increase of 5% year-over-year in average annual population served. Moving forward, based on the State of Colorado's projections for Summit County, the District is planning for a 2% growth rate in the permanent population (CSDO 2015) as well as the annual average service population.

4.3 RESIDENTIAL SECTOR

Housing in Copper Mountain reflects the characteristics of a ski town. Approximately 93% of the available housing units are designated as multifamily housing (ACS 2015). The remaining housing units are single-family detached and single-family attached homes. The average building age dates to the mid-1980s (ACS 2015). Older buildings often represent opportunities for indoor water savings through the replacement of fixtures and appliances. However, the District does not have jurisdiction over plumbing and building codes in the service area; development is subject to the codes adopted by Summit County. The high proportion of multifamily units and transient population represents a challenge for water education and outreach efforts.

The median household income in Copper Mountain is \$26,595, well below the State median income of \$60,629 (ACS 2015). While lower incomes can indicate that financial savings from reductions in water use can be motivational, that income profile does not apply to the visiting population. The District needs to engage and influence the larger transient population to effect long-lasting water savings.

In terms of residential expansion, there are several projects being considered, including an approximately 80-unit workforce housing development and a hotel and neighborhood development on the east side of the ski area that has a residential component. Copper Mountain Resort is currently working with the Summit County Building Department on both of these projects. It is also important to note that while much of the residential property in the area has been developed, there are still a number of properties available for single-family and multifamily structures.

4.4 COMMERCIAL AND INDUSTRIAL SECTOR

Copper Mountain ski resort employs approximately 1,600 people in the winter and 700 people in the summer. It is also important to note that Copper Mountain ski resort owns water rights for snowmaking and golf course irrigation that are independent of the District's operations.

Since Copper Mountain is surrounded by national forest, the opportunity for boundary expansion is limited. Growth potential is driven by infill projects, including the hotel and neighborhood development previously described, and a standalone hotel that is also in the planning phase. If these projects are developed, along with the residential development projects, they will represent a substantial increase in water demands that may require additional water rights and supply infrastructure.



5 EXISTING WATER AND WASTEWATER SYSTEM

5.1 RAW WATER SUPPLIES

The District has historically been supplied by three groundwater wells (Wells 1A, 2, and 3) that pump from the West Ten Mile Aquifer. The District owns a portfolio of water rights to pump up to a combined 1 cfs (715 ac-ft/yr) from these wells.

In 2017, Well 3 was reclassified as groundwater under direct influence (GWUDI) of surface water. The District was required to shut down the well and lost approximately 500 gpm in production capacity. Under the same action by the Colorado Department of Public Health and Environment, Well 1A was reclassified as a conditional groundwater source resulting in its production capacity being reduced from 500 gpm to 250 gpm. The combined reduction in production capacity of 750 gpm required the District to evaluate whether to develop new groundwater sources or to provide more advanced water treatment for the existing wells. The District chose to develop new groundwater sources.

To replace production from Wells 1A and 3, the District constructed a new groundwater well (Well 4), that has a production capacity of approximately 750 gpm. The District is currently in the process of transferring water rights from Well 3 to Well 4.

Looking into the future, the District has estimated water demands at buildout to be 1,840 ac-ft/yr (1,140 gpm), which exceeds the District's current water rights. In addition to transferring existing water rights from Well 3 to Well 4, the District is attempting to secure additional water rights to meet future demands. The current demand estimates at buildout do not account for all additional demands from the residential and commercial projects being developed or conceptualized, in which case the District is considering whether an additional well (Well 5) and water rights are needed.

Table 1 presents a summary of the District's historical, current, and future anticipated water supplies.

Table 1: Summary of Raw Groundwater Supplies

Time Period	Groundwater Sources	Water Rights		Fixed Capacity		Firm Capacity	
		gpm	cfs	gpm	cfs	gpm	cfs
Before August 1, 2017	Wells 1A – 2 – 3	443	1	1,725	3.8	1,000	2.2
After August 1, 2017	Wells 1A – 2 – 4	443	1	1,725	3.8	975	2.2
Buildout in 2040 (incl. 2 new hotels)	Wells 1A – 2 – 4 – 5	642	1.43	2,225	5.0	1,475	3.3



5.2 TREATMENT AND DISTRIBUTION

The District does not have a water treatment plant. The raw groundwater is good quality and requires only disinfection using sodium hypochlorite to meet drinking water standards. All water is treated to drinking water quality standards – the District does not distribute raw, non-potable, or reclaimed water supplies.

The distribution system includes about four miles of ductile iron piping, one pumping station, and two storage tanks with a combined capacity of 1 MG. The pumping station houses four pumps which operate in a lead/lag/standby control sequence to provide adequate supply and system redundancy. The system also includes a 2,500 gpm fire pump that provides emergency fire flows.

The District struggles with high pressures created by the steep terrain and the fact that the distribution system includes only one pressure zone. At the lowest point in the system, the water pressure can be around 150 psi. The District requires all customers to have pressure-reducing valves installed, but customers still occasionally report water hammer problems.

5.3 WATER DISTRIBUTION AND NON-REVENUE WATER USES

The District provides retail water to residential and commercial customers, and wholesale water to contractors that serve the Copper Mountain ski resort. Non-revenue water uses include hydrant flushing, system leaks, and water used for firefighting. More information on non-revenue water is included in **Section 6.1.3** as part of the discussion of historical system demands.

5.4 WASTEWATER COLLECTION AND TREATMENT

The District provides wastewater collection and treatment services in addition to water services. The 1.1 MGD wastewater treatment plant (WWTP) includes trash and grit removal, activated sludge, filtration, and ultraviolet disinfection treatment. The treated effluent is discharged to Ten Mile Creek. Biosolids from the plant's aerated digesters are recycled at the CLIMAX mine.

5.5 WATER AND SANITATION RATES

In 2015, the District adopted an inclining block rate structure to discourage excessive water use and to establish a fair and equitable assessment of water consumption (**Table 2**). The rates are revised annually based on budget projections. The pricing structure is based on Copper Equivalent Units (CEUs), which are calculated as actual water consumption (in gallons) divided by 10,000 gallons. Because most of the buildings in the service area contain a mix of residential and commercial customers, the rates do not differentiate between these two sectors. All irrigation use is separately metered and subject to an irrigation pricing rate that is slightly lower than the Tier 2 water consumption rate. This lower pricing reflects the fact that irrigation return flows are not treated by the wastewater treatment plant. The irrigation pricing rate is also applied to wholesale water provided to contractors and for special events.



Table 2: 2017-2018 Combined Water and Sanitation Rates (District 2017)

Pricing Tier	Pricing Rate (per CEU per quarter)
Water Base (Flat) Rate	\$37.95
Sanitation Base (Flat) Rate	\$139.43
Tier 1: Use within CEU	\$7.70/1,000 gallons consumed
Tier 2: Use over CEU	\$11.55/1,000 gallons consumed
Irrigation Rate	\$10.51/1,000 gallons consumed

The District revises the CEU calculations and corresponding base allotments for customers every two years. The rate structure is designed to impose a higher base rate on customers that use more water while allowing them a higher Tier 1 volume based on historical consumption. Similarly, consumers that use less water will have a smaller base rate and smaller Tier 1 allotment. This pricing structure inherently allows customers with higher CEU allotments to use more water before triggering Tier 2 rates than customers with lower CEU allotments, but the corresponding increase in base rates provides a strong incentive for conservation.

Because the tax base in Copper Mountain is relatively small, the District relies heavily on water and sanitation fees for operating revenues. The District operates as an enterprise fund, and as such does not rely on taxes or other forms of revenue to subsidize water and sewer expenses. Customers are billed quarterly.

5.6 SYSTEM RELIABILITY, LIMITATIONS, AND FUTURE NEEDS

5.6.1 Reliability

The District's water system is highly reliable. The District has never suffered from a loss of water supply, a failure to meet system demands, or a decline in groundwater levels in the supply aquifer, even during the significant droughts that occurred in 2002 and 2012.

5.6.2 Vulnerabilities

5.6.2.1 Natural Hazards

Because the District's water supply originates from groundwater sources, it is less susceptible to natural hazards than other systems. For example, in the case of wildfire, the District's risk would come from infrastructure exposure rather than water source contamination. The District has constructed fire breaks around most of its facilities, including the water storage tanks. The District has not historically experienced any issues with flooding, as there are large flood channels and good drainage characteristics in the watershed.

5.6.2.2 Infrastructure

Distribution system leaks can be significant, but the implementation of an annual leak detection program has minimized the number and severity of leaks that occur. Although the distribution system does have multiple looped segments, leaks and main breaks can be difficult to isolate due to aging infrastructure. The number of valves in the system is not adequate and some of the valves do not fully close, while others are completely inoperable. Beginning in 2017, the District



has begun to identify system deficiencies and to replace valves and other aging system components.

5.6.3 Future Needs

As stated previously, the District is working to procure additional water rights (at an estimated cost of \$30,000-\$50,000) and is considering developing a new well to support growth in commercial sector demands (at an estimated cost of \$600,000-\$800,000). Water conservation efforts are one mechanism to help the District manage demands and minimize expenditures associated with additional water rights and infrastructure.



6 HISTORICAL WATER DEMANDS AND DEMAND MANAGEMENT

6.1 HISTORICAL WATER DEMANDS

The District tracks several measures of system production, system efficiency, and water use patterns. The following sections present information that describes historical systemwide demands. All readily available information is presented; it should be noted that the period of available data varies among metrics. **Appendix A** contains a summary of all data presented in this plan.

6.1.1 Annual Treated Water

Annual treated water production volumes for the period 2011-2016 are shown in **Figure 3**. These data have not been normalized for weather or other factors that affect water demands from year to year. Production volumes increased through 2013 but have remained relatively consistent since then.

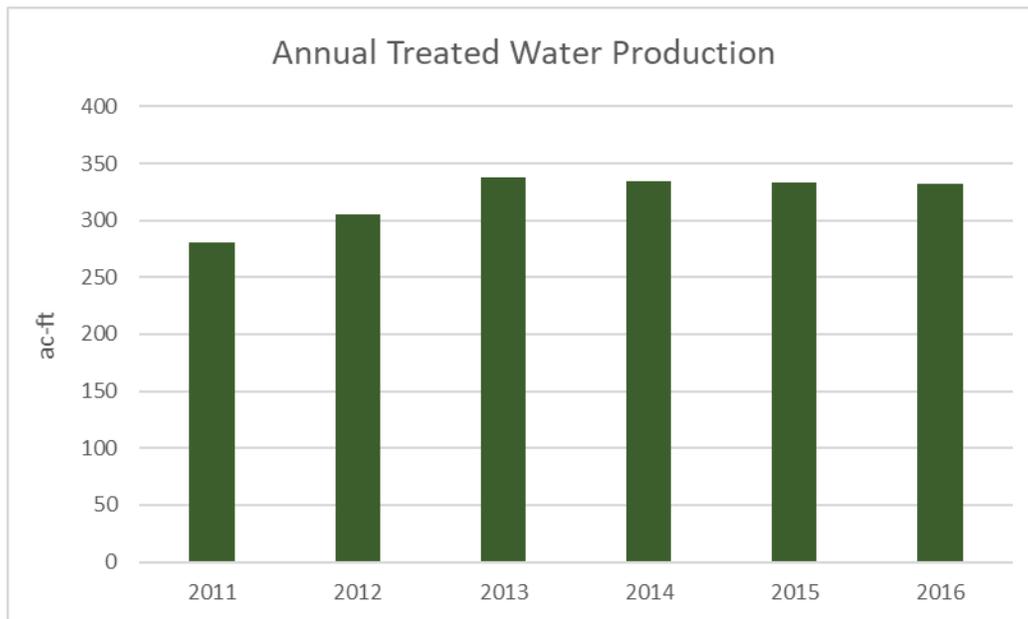


Figure 3. Annual Treated Water Production (2011-2016)

6.1.2 Monthly Treated Water

The District experiences two periods of high water demands throughout the year: in winter (due to ski-related tourism) and in summer (due to tourism and outdoor water use). **Figure 4** presents average monthly water production volumes for the period 2011-2016 that demonstrate the fluctuation in demands throughout the year.

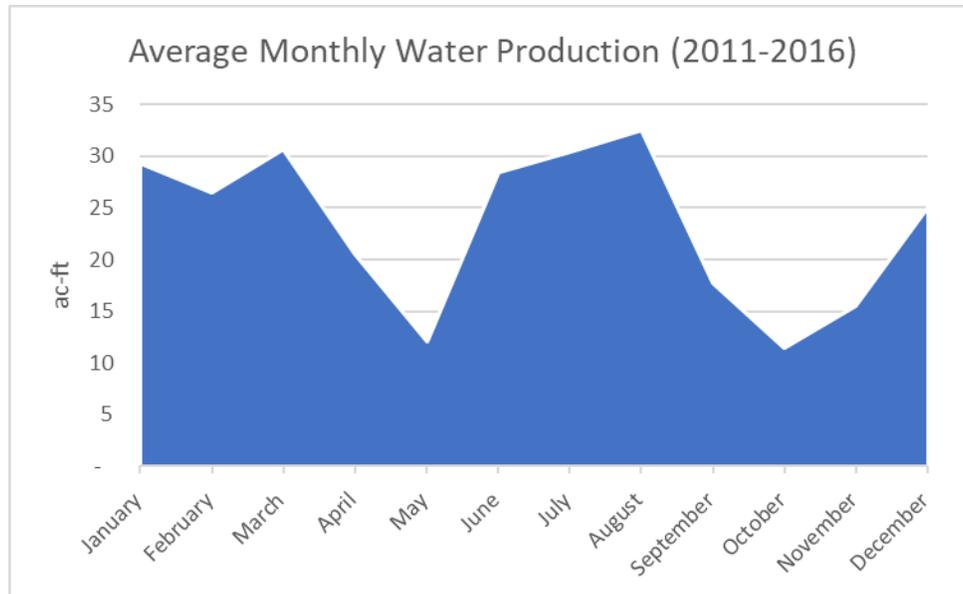


Figure 4: Average Monthly Water Production (2011-2016)

The volume of water used for irrigation and other outdoor uses within the District’s service area is relatively low. In 2016, only 14% of annual sales represented outdoor water use.

6.1.3 Non-Revenue Water

The volumetric difference between water production and metered water consumption is referred to as non-revenue water. Non-revenue water uses in the District’s system include hydrant flushing, system leaks, and water used for firefighting. Annual non-revenue water estimates, expressed as a percentage of production volumes, are shown in **Figure 5** for the period 2013-2016. The District manages non-revenue water volumes primarily through a leak detection and repair program. The District suspects that variability in non-revenue water estimates may be partially explained by gaps in historical water usage data records. The District is currently developing better methods for data management and analysis, including consolidating historical data.

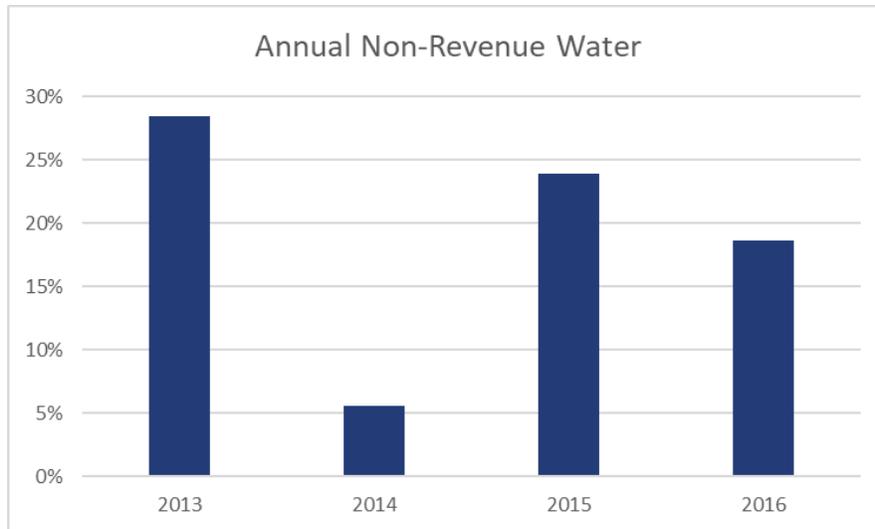


Figure 5. Annual Non-Revenue Water (2013-2016)

6.1.4 System-wide Per Capita Water Demands

The District calculates system-wide per capita water demands using water production volumes and the average annual population served, which includes both the resident and visiting population. Over the past few years, the District has experienced variable, but slightly declining, system-wide per capita demands (**Figure 6**).

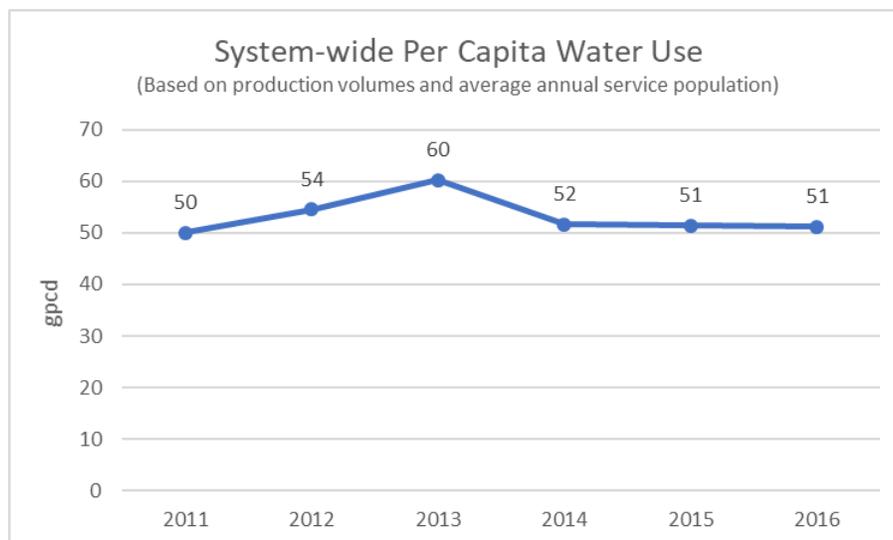


Figure 6. System-wide Per Capita Water Demands (2011-2016)

The District uses system-wide per capita values as one measure of water use that accounts for development and growth in the system. As the metric is currently calculated, the values include non-revenue water volumes. It's worth noting that per capita metrics are most useful for assessing trends internal to a system rather than comparing across water providers. As noted in the Municipal Water Efficiency Plan Guidance document (CWCB 2012):



[Per capita water use metrics] should not be used as a means to compare water usage between other providers. This is partially attributed to [...] the fact that there are many other factors that can skew the data, negating an “apples-to-apples” comparison. Such factors include large commercial and industrial sectors that can significantly influence system-wide per capita water demands. Additionally, resort communities can experience difficulties in developing representative annual per capita water demands. The numbers of visitors often vary seasonally (e.g. ski season) and are also impacted by economic conditions and weather.

6.2 PAST AND CURRENT DEMAND MANAGEMENT ACTIVITIES

The District began taking foundational steps towards demand management beginning in 2015.

6.2.1 Metering and Data Collection

In 2016, the District began implementing Advanced Metering Infrastructure (AMI) that allows customer meters to be read remotely every five minutes. The AMI system helps the District identify and repair customer leaks more quickly. This is very important for the Copper Mountain area because many residential units are unoccupied most of the year, which can result in leaks going undetected for long periods of time.

The District runs a program to replace failed meters with the new advanced meters. Approximately 40 of 260 meters have been replaced to date. The District estimates that it will take 15 years for all meters to be replaced under current budget projections, unless outside support can be procured from grant funding or through cost-sharing with property managers. The District has begun outreach efforts with homeowner’s associations (HOAs) about the meter replacement program.

The District has not estimated water savings associated with the AMI system, but has realized additional revenues by replacing antiquated meters that were not properly recording water use.

As mentioned previously, the District is also developing better processes for data management and analysis. These efforts have already highlighted system inefficiencies that the District has worked to improve through equipment repairs.

6.2.2 System Water Loss Management and Control

Beginning in 2014, the District has contracted out an annual system-wide leak inspection and valve exercises. In the 2016 inspection, no leaks were found. Leaks identified in 2017 were immediately located and repaired.

6.2.3 Efficiency-Oriented Rates and Tap Fees

As described previously in Section 5.5, the District adopted an inclining block rate structure in 2015 to encourage water efficiency and to establish a fair and equitable assessment of water consumption. The water rates are updated annually based on budget projections. Rates were last increased by 10% effective October 1, 2017.

The District’s tap fees are also structured to encourage water efficiency by using potential consumption based on tap size to determine the total tap fee. As of October 1, 2016, the water tap fee is set at \$4,100 per CEU and the sewer tap fee is set at \$5,600 per CEU. The District does



not have additional funding sources that can be used to subsidize tap fees, so new infrastructure and development must pay for actual costs to add the new services. At this time, the tap fees are established to recover infrastructure and other fixed costs, but do not include recovery of costs associated with acquiring additional water rights.

6.2.4 Water Use Regulations

Summit County has jurisdiction over building and plumbing codes in the service area. In 2016, the State of Colorado passed SB14-103, also known as Colorado's Indoor WaterSense Fixture Requirement, requiring that only certified WaterSense fixtures be sold in the State of Colorado.

6.2.5 Historical Water Savings

Since 2013, the District has seen relatively stable production volumes and systemwide per capita water use values. Although the District has achieved some water savings through meter replacements and system-wide leak inspections, the water savings have not been quantified.



7 WATER EFFICIENCY GOALS AND DEMAND FORECASTS

The District is currently using two planning horizons: through 2025 (for the purposes of this water efficiency plan), and through the year 2040, when buildout is expected to occur.

As part of the preparation of this water efficiency plan, three demand forecasts were prepared (Figure 7):

- **High growth.** This is a high growth forecast that assumes demands will grow at a rate of 3.4% year-over-year based on historical trends over the past five years.
- **Business-as-usual.** This forecast accounts for growth in demands as well as water savings from recently implemented efficiency activities.
- **Active efficiency measures.** This forecast includes projected water savings from additional efficiency activities implemented in the future.

The demand forecasts diverge in 2018, when implementation of new efficiency activities is assumed to begin.

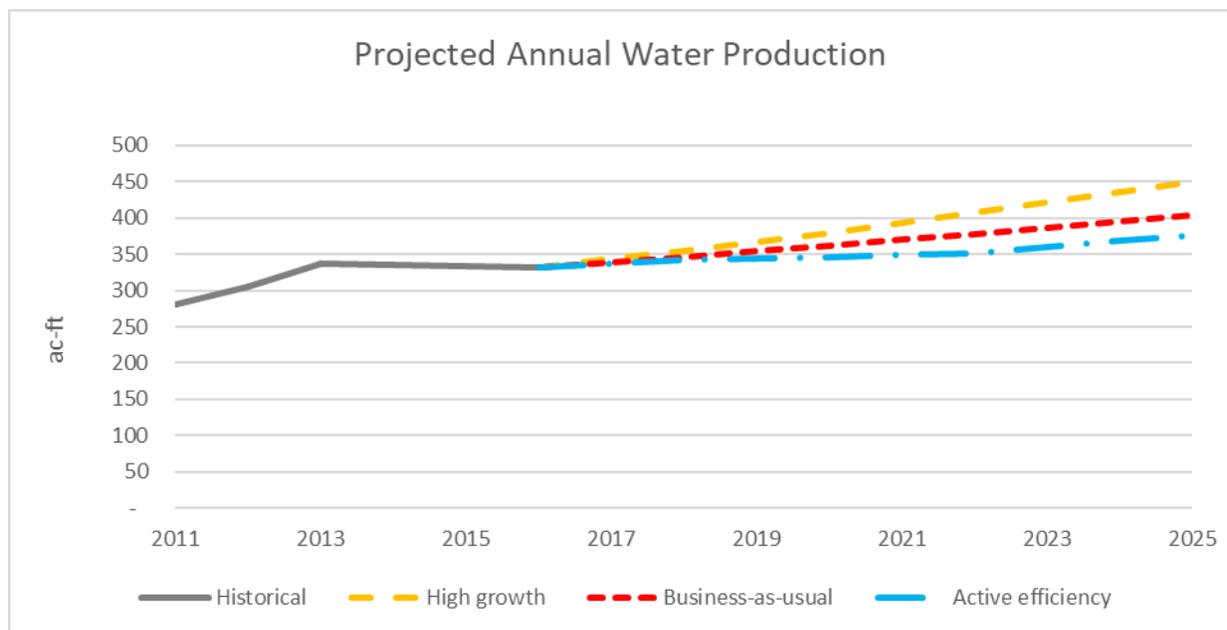


Figure 7: Projected Annual Water Production Volumes (through 2025)



COPPER MOUNTAIN CONSOLIDATED METROPOLITAN DISTRICT WATER EFFICIENCY GOALS

Over the period 2018-2025, the District aims to implement additional efficiency activities to achieve:

- Annual water savings of 25 ac-ft/yr by the year 2025, compared to the business-as-usual forecast.
- Cumulative water savings of 160 ac-ft over the period 2018-2025 compared to the business-as-usual forecast.
- Reductions in peak demands during the summer associated with outdoor water use.
- Increased awareness by residents and visitors about the importance of water resources and water conservation.
- Reductions in water use to avoid drilling new water supply wells.



8 SELECTION OF WATER EFFICIENCY ACTIVITIES

The District plans to implement additional water conservation measures to supplement current activities and achieve the water efficiency goals presented in **Section 7**. Future activities were identified using multiple factors that included utility priorities, stakeholder input, opportunities for water savings, technical feasibility, and implementation capacity. When feasible, the efficiency activities were quantified in terms of their potential for water savings, customer sectors and end-uses impacted by the measure, and implementation costs. A summary of activities that the District aims to implement over the next seven years is shown in **Table 3**.

Table 3. Summary of Planned Water Efficiency Activities

Water Efficiency Activity	Sectors Impacted	Implementation Period	Projected Water Savings in 2025
Foundational Activities			
Advanced Metering Infrastructure and Enhanced Water Loss Control	All Customers	2018-Ongoing	23 ac-ft/yr
Conservation-Oriented Rates	All Customers	2020-Ongoing	1.5 ac-ft/yr
Billing Upgrades	All Customers	2019-Ongoing	Not Quantified
Institutional Collaboration	Utility	2017-Ongoing	Not Quantified
Targeted Technical Assistance and Incentives			
Indoor Water Efficiency	Residential	2018-Ongoing	Not Quantified
Outdoor Water Efficiency	All Customers	2020-Ongoing	2 ac-ft/yr
Ordinances and Regulations			
Land Use Planning	All Customers	2017-Ongoing	Not Quantified
Education Activities			
Education and Outreach	All Customers	2018-Ongoing	Not Quantified
Total Annual Savings in 2025			26.5 ac-ft/year

8.1 FOUNDATIONAL ACTIVITIES

8.1.1 Advanced Metering Infrastructure and Enhanced Water Loss Control

As discussed previously, the District has upgraded approximately 15% of meters to AMI. Completing the remaining 85% will enable the District to realize additional income from improved meter functioning and to identify customer leaks more effectively. When the infrastructure is fully in place, the District expects to save 7% of total water use annually (23 ac-ft/yr). The costs to complete the meter upgrades are estimated to be \$350,000, including capital expenditures and staff costs associated with the new program. Given the high cost of this activity, implementation is expected to occur over five years.



8.1.2 Conservation-Oriented Water Rates

As part of the next rate study, the District intends to reevaluate the pricing structure, rates, and tier thresholds to determine whether changes to any of these items could better incentivize conservation while preserving the District's revenues. The next rate study is expected to occur in 2020 and cost \$20,000 as an upfront cost with no ongoing costs. Updates to the pricing structure are expected to help the District conserve approximately 1.5 ac-ft/yr of water. These water savings estimates assume that customers will reduce consumption by an average of 7.5% per year (Green and Maddaus, 2010). The estimate also takes into account that some water savings are already being realized through the District's current pricing structure.

8.1.3 Billing Upgrades

The District intends to partner with a contractor to provide customers with the WaterSmart Report Card. The report card will give customers more detailed information about their water usage, how their usage compares to similar customers, and suggestions for improving their efficiency. The program is expected to be implemented in 2019. Costs associated with this program are expected to be encapsulated in an estimated contracted amount of \$2,000 per year. Water savings from this activity were not quantified and are not relied upon to meet the District's water conservation goals. In addition to potential water savings, the public engagement associated with the report card will be extremely valuable.

8.1.4 Institutional Collaboration

The water efficiency planning process offered an opportunity for District staff to align around water supply and water conservation planning. In the future, the District seeks to continue interdepartmental communications and will continue to participate in a regional water conservation committee convened by High Country Conservation Center.

8.2 TARGETED TECHNICAL ASSISTANCE AND INCENTIVES

8.2.1 Indoor Water Efficiency

The District intends to promote a regional indoor water efficiency program being developed by a working group and led by High Country Conservation Center. The program will provide residential indoor water audits and will include direct installation of some water saving fixtures (e.g., aerators, showerheads, toilet bricks) during the home visit. Additionally, businesses that participate in the Resource Wise sustainable business program will be provided with water savings recommendations and limited direct installations of high-efficiency water fixtures.

The indoor efficiency program is only now being designed, and grant and foundation funding sources are being evaluated. The District does not intend to fund the program directly but will promote the program to its customers and support High Country Conservation Center in seeking funding. The water savings from this program were not quantified and are not relied upon to meet the District's water savings goals.

8.2.2 Outdoor Water Efficiency

During the planning process, stakeholders began to design an outdoor water efficiency program that will include two related components:



- An outdoor water audit program to evaluate irrigation systems for efficiency improvements.
- An irrigation optimization program to implement efficiency improvements.

Customers that complete the irrigation optimization program will be eligible for rebates based on the expected annual savings from the upgrades. These programs are targeted at both residential and commercial customers.

As a conservative estimate of potential water savings, the District assumed that 5% of all customers will participate each year in the audit program, and that 25% of audit participants will complete the optimization program. Participants are expected to reduce their outdoor water use by 15% at each step of the program. Using these assumptions, the District would expect to conserve 2 ac-ft/yr of water.

Although the District does not have the financial resources to develop an outdoor water efficiency program, they intend to work with High Country Conservation Center and other water providers to develop and implement a program. The audit program would cost approximately \$6,500 per year while the optimization program would cost approximately \$8,000 per year to cover rebates, staff costs, and post-optimization audits for participants. The participant cost would be \$125 for residential audits, \$500 for commercial audits, and an average of \$700 dollars per installation for the optimization program. The District and partners aim to implement the regional audit program in 2020, and the regional optimization program in 2021.

8.3 ORDINANCES AND REGULATIONS

The District does not have regulatory authority over plumbing and building codes in the service area. All changes to ordinances and regulations must come at the County level. To this end, additional regulations regarding water use and efficiency requirements are the topic of a regional working group. As the working group is only now being convened, specific opportunities for water savings have not yet been identified or quantified.

8.4 EDUCATIONAL ACTIVITIES

Educational efforts are being led regionally by High Country Conservation Center. The top priorities for 2018 that have been identified include:

- Developing or assembling water conservation materials that are targeted to priority sectors in support of implementation efforts under this plan.
- Developing strategies for engaging the visiting and second homeowner population in Summit County.
- Promoting awareness around joint energy-water savings opportunities.
- Identifying key events and outreach channels for education and awareness efforts.

Water savings from planned educational programs have not been quantified and are not relied upon to meet the District's water conservation goals.



9 IMPLEMENTATION AND MONITORING PLANS

9.1 IMPLEMENTATION

The District's approach to implementing the new water efficiency activities described in **Section 8** includes the following steps:

- Determine the organization responsible for leading the activity.
 - In general, the District will be responsible for the implementation of the foundational activities (billing upgrades, AMI and enhanced water loss control, and conservation-oriented rates).
 - High Country Conservation Center will lead institutional collaboration, the development of a residential indoor water efficiency program, and education and outreach efforts.
 - The lead organization for the outdoor water efficiency program is yet to be determined.
- When needed, work with other organizations and partners to develop implementation action plans, define funding needs, and exchange information about best practices and lessons learned. The District has already begun this collaboration in working with the High Country Conservation Center's executive committee during this water efficiency planning process and by participating on several implementation working groups that formed near the end of the planning process.
- Determine funding needs and sources for the activity.
 - For activities to be funded entirely or in part by the District's operating budget, work within the annual budgeting cycle. This approach will require identifying budget priorities and estimates a year before the activity is to be implemented.
 - For activities to be funded by external sources, look for grant and other funding opportunities. **Appendix B** includes a summary of the implementation resources that were identified during the planning process.

Table 4 summarizes the estimated annual costs for the District-led activities based on the implementation schedule presented in this plan. Implementation costs will be funded primarily through the District's operating budget, although external funding sources will also be evaluated.



Table 4. Annual Implementation Costs

Year	Advanced Metering Infrastructure and Enhanced Water Loss Control	Conservation-Oriented Rates	Billing Upgrades	Total
2018	\$70,000	-	-	\$70,000
2019	\$70,000	-	\$2,500	\$72,500
2020	\$70,000	\$20,000	\$2,500	\$92,500
2021	\$70,000	-	\$2,500	\$72,500
2022	\$70,000	-	\$2,500	\$72,500
2023	-	-	\$2,500	\$2,500
2024	-	-	\$2,500	\$2,500
2025	-	-	\$2,500	\$2,500

At the end of the water efficiency planning process, four working groups were formed to guide implementation of the regional activities:

- Education and outreach
- Indoor water efficiency
- Integrated water and land use planning
- Outdoor water efficiency

Appendix C includes implementation action plans that were developed for each working group to help transition from planning to implementation. The action plans were included as appendices so that they can evolve as the working groups meet and make progress.

9.2 PLAN REVIEW, MONITORING, AND UPDATES

The Water Conservation Act of 2004 (HB04-1365) requires that the water efficiency plan be made publicly available for review and comment for a period of 60 days, and that the plan be locally adopted by the District’s Board. The District will comply with these requirements by placing the draft plan on the Board’s meeting agenda, providing public notice of the plan, allowing time for public review and comment, and adopting the plan after it is reviewed by the Colorado Water Conservation Board. After the plan has been adopted by resolution by the Board, **Appendix D** will contain a copy of the resolution.

The District intends to monitor the success of the water efficiency programs using the metrics presented in **Section 6.1 (Historical Water Demands)**. The District will use **Appendix A** to track the metrics annually. If the District finds that any of the water efficiency programs are not effective in achieving water savings, or are not cost effective, the programs may be discontinued.

At a minimum, the District will update this plan every seven years, in accordance with the Water Conservation Act of 2004. The District will aim to update the plan more frequently, perhaps every five years, when financially feasible. Plan updates will incorporate the new data accumulated from the annual monitoring process and may include revisions to the District’s water efficiency goals and planned activities, as appropriate.



REFERENCES

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- Colorado Water Conservation Board (CWCB). 2012. *Municipal Water Efficiency Plan Guidance Document*. Accessed April 2017 at <http://cwcb.state.co.us/technical-resources/water-conservation-plan-development-guide/Documents/FinalWaterEfficiencyGuidanceDocument.pdf>.
- Copper Mountain Consolidated Metropolitan District (District). 2017. *2017-2018 Rate Structure*. Effective October 1. Accessed October 2017 at http://coppermtnmetro.org/images/2017-2018_WAS_Rates.pdf.
- Green, Deborah and William Maddaus. 2010. *Water Conservation for Small and Medium-Sized Utilities*. American Water Works Association. <https://www.awwa.org/store/productdetail.aspx?productid=6629>.



APPENDIX A: PLAN DATA

Provided in a separate document.



APPENDIX B: IMPLEMENTATION RESOURCES

Organization / Individual	Implementation Resource	Resource Type	Additional Information
Aaron Clay	Water Law in a Nutshell Workshop	Education and Training	Contact High Country Conservation Center or Middle Park Conservation District
American Water Works Association	Topics area: water conservation programs, water loss control	Technical guidance	Website
American Water Works Association Rocky Mountain Section	Topics: water conservation, tap fees	Training	Website
Colorado Water Conservation Board	Water Conservation Implementation Grants	Grant Funding Source	Website
Colorado Water Conservation Board	Water Resource Conservation Public Education and Outreach Grants	Grant Funding Source	Website
Colorado Water Conservation Board	Water Plan Grants	Grant Funding Source	Website
Colorado WaterWise	Live Like You Love It	Education and outreach materials	Website
Irrigation Association	Topics: landscape water management	Training	Contact Northern Water (2018 training host)
Rural Communities Assistance Program	Topic areas: Water loss control, managerial, financial	Training and technical assistance	Website Contact Jeff Oxenford (720-353-4242)
Sonoran Institute	Land Use and Water Planning Workshop	Education and Training	Website
WaterNow	Project Accelerator Program	Technical and program assistance	Website



APPENDIX C: IMPLEMENTATION ACTION PLANS

EDUCATION AND OUTREACH

Last Updated: January 14, 2018

Next Meeting Scheduled: March 15, 2018

Working Group Role	Name and Organization
Group coordinator <i>(responsible for scheduling meetings and communications)</i>	Jessie Burley, High Country Conservation Center
Team members <i>(responsible for helping with action items)</i>	<p>Joyce Allgaier, Town of Frisco</p> <p>Abbey Browne, Woodwinds Property Management</p> <p>Robert Buras, Town of Dillon</p> <p>Shellie Duplan, Buffalo Mountain Metro District</p> <p>Jeff Goble, Town of Frisco</p> <p>Greg Hardy, Trout Unlimited</p> <p>Hallie Jaeger, High Country Conservation Center</p> <p>Laura Lynch, Town of Breckenridge</p> <p>Zach Margolis, Town of Silverthorne</p> <p>Katlin Miller, Middle Park Conservation District</p> <p>Mike Nathan, A-Basin</p> <p>Deborah Polich, ?</p> <p>Jen Schenk, High Country Conservation Center</p> <p>Dan Schroder, CSU Extension</p> <p>Karn Stiegelmeier, Board of County Commissioners</p> <p>Troy Wineland, Division of Water Resources</p>

Key
 Black = confirmed
 Red = needs confirmation

SUMMARY OF 2018 GOALS

- Develop a coordinated education and outreach program for water conservation

STRATEGIES TO ACHIEVE GOALS

Strategy 1: Develop targeted materials by sector

- Identify top priorities for education and outreach
 - Landscaper
 - Indoor
 - Outdoor
 - Commercial
 - Residential
- Inventory existing materials and resources
 - Water utility websites (Denver Water, Town of Breckenridge, etc.)
 - Colorado WaterWise (Live Like You Love It)
 - EPA Water Sense
 - Water audit and related service providers
- Adapt existing materials and develop new materials



- Identify outreach channels
 - Bill enclosures
 - Social media
 - Websites
 - Events
 - Summit Daily
 - Water Warriors program
- Disseminate materials

Strategy 2: Engage the visiting population and second homeowners

- Come up with a message and then keep delivering the message because it's a changing population
- Compile list of HOAs and contact information

Strategy 3: Leverage High Country Conservation Center's Energy Programs

- Anytime talk about water, talk about energy and vice versa

Strategy 4: Aggregate and push out related information and events from other organizations

- Fix-a-leak week

SUMMARY OF ASSIGNED ACTION ITEMS

Action Item	Responsible Team Member	Due Date
Create marketing plan strategy		
Connect with organizations that can help with information dissemination		



INDOOR WATER USE EFFICIENCY

Last Updated: January 13, 2018

Working Group Role	Name and Organization
Group coordinator <i>(responsible for scheduling meetings and communications)</i>	Laura Lynch, Town of Breckenridge
Team members <i>(responsible for helping with action items)</i>	Robert Buras, Town of Dillon Jeff Goble, Town of Frisco Jess Hoover, HC3 Cody Jensen, HC3 Mike Nathan, A-Basin Deborah Polich, ? ?, Summit County Building/Planning Dept
Key Black = confirmed Red = needs confirmation	

SUMMARY OF 2018 GOALS

- Pilot a residential program
- Develop a commercial outreach channel

STRATEGIES TO ACHIEVE 2018 GOALS

Goal 1: Pilot a residential program that includes educational materials, audits, direct installs, and/or rebates/incentives.

- Leverage HC3’s Energy Smart Colorado program for indoor energy efficiency.
 - At a minimum, assess energy program for best practices and lessons learned to inform water program design.
 - Also consider leveraging energy program as an education and outreach channel (e.g., leave materials on water efficiency with residents when conducting an energy assessment).
- Research existing information and programs
 - Evaluate existing residential programs, with an emphasis on comparable mountain communities.
 - For example, Resource Central has a “Slow the Flow” program that includes a residential indoor audit program.
 - Identify rebate structures/incentives.
 - Evaluate types of direct installs needed.
 - Find biggest water savings potential for each rebate measure.
 - Compile effective educational materials.
- Design the pilot program
 - Identify water providers interested in participating in the pilot program.
 - Determine funding needs and sources for pilot program.
- Execute the pilot program.
- Assess performance of the pilot program to inform larger-scale implementation.



Goal 2: Develop a commercial outreach channel

- Research existing information.
 - Compile effective educational materials relevant for various commercial sectors.
- Leverage HC3's Resource Wise green business program to connect with businesses and find water savings opportunities.
 - Use the program as an education and outreach channel
 - Leave sector-specific materials on water efficiency with businesses as part of engagement.
 - Hold a Business Lunch n' Learn workshop on water in 2018.
 - Evaluate the potential to expand the program in offering and implementing recommendations for improving water efficiency based on the results from the sustainability and energy assessment.
 - Add information about the energy-water nexus on summary reports
 - Provide water efficiency recommendations to businesses with low water scores
 - Use available funding (\$400/business) towards upgrades and projects
 - Direct installs of toilet bricks and pre-spray rinse valves
 - Determine whether water savings from these activities can be modeled

SUMMARY OF ASSIGNED ACTION ITEMS

Action Item	Responsible Team Member	Due Date
<i>Identify fixtures/appliances to target for incentives based on water savings potential</i>	Mike	March 2018
<i>Research existing residential water efficiency programs</i>	Laura	March 2018
<i>Flesh out potential to leverage existing HC3 programs, resource needs, etc.</i>	Jen	March 2018
<i>Evaluate opportunities for leveraging Resource Wise</i>	Jess and Jessie	March 2018



INTEGRATED WATER AND LAND USE PLANNING

Last Updated: January 14, 2018

Working Group Role	Name and Organization
Group coordinator <i>(responsible for scheduling meetings and communications)</i>	Joyce Allgaier, Town of Frisco
Team members <i>(responsible for helping with action items)</i>	<p>Graeme Bilenduke, Copper Mountain ski resort</p> <p>Robert Buras, Town of Dillon</p> <p>Mark Cassalia, Denver Water</p> <p>Allison Fulton, Copper Mountain Metro</p> <p>Jeff Goble, Town of Frisco</p> <p>Peter Grosshuesch, Town of Breckenridge</p> <p>Katie Kent, Town of Frisco</p> <p>Susan Lee, Town of Silverthorne</p> <p>Zach Margolis, Town of Silverthorne</p> <p>Mike Nathan, A-Basin</p> <p>Pete Oltman, North Line GIS</p> <p>Ed Pankevicius, Copper Mountain Metro</p> <p>Don Reimer, Summit County</p> <p>Elena Scott, Norris Design</p> <p>Ned West, Town of Dillon</p> <p>Lane Wyatt, NWCCOG</p>
<i>Key</i>	
<i>Black = confirmed</i>	
<i>Red = needs confirmation</i>	

SUMMARY OF 2018 GOALS

- Conserve water through collaboration and actions that support all agencies in our region

STRATEGIES TO ACHIEVE GOALS

Strategy 1: Code Amendments

- Audit codes and additional regulations to identify existing barriers and incentives to water conservation (Joyce and regional planners)
- Amend water standards, codes (require certain irrigation materials and systems) - Jeff
- Look at tap fees and tying to/paying more for landscaping (Mark)
 - See Castle Rock and Aurora programs
 - Schedule an educational workshop
 - Share literature
- Look at stormwater management regulations (bioswales, tree gardens)
- Land use typology
 - Apply budgets to different types of land uses (e.g. – ballfields vs. aesthetic landscape areas) – for example, Denver Water

Strategy 2: Collaboration and Engagement

- Engage all special and metro districts to implement plan
- Set common goals among towns, districts, others to coalesce efforts (even if done at different times)



- Tap informational and regulation resources to raise the bar, give guidance, help share information and information about grants and capacity building (NWCCOG)
- Engage large water users

Strategy 3: Advance water reuse programs, especially for golf courses and snowmaking parks (Lane Wyatt and Torie Jarvis from NWCCOG QQ)

SUMMARY OF ASSIGNED ACTION ITEMS

Action Item	Responsible Team Member	Due Date	Action Item
Convene planners to initiate code audits	Joyce	Jan 2018	
Schedule an educational session on tap fees	Mark	Jan 2018	Scheduled for June 2018 through AWWA RMS



OUTDOOR WATER USE EFFICIENCY

Last Updated: January 14, 2018

Working Group Role	Name and Organization
Group coordinator <i>(responsible for scheduling meetings and communications)</i>	Troy Wineland, Colorado Division of Water Resources
Team members <i>(responsible for helping with action items)</i>	<p>Abbey Browne, Woodwinds Property Management</p> <p>Robert Buras, Town of Dillon</p> <p>Jeff Goble, Town of Frisco</p> <p>Torie Jarvis, NWCCOG</p> <p>Laura Lynch, Town of Breckenridge</p> <p>Zach Margolis, Town of Silverthorne</p> <p>Mike Nathan, A-Basin</p> <p>Ed Pankevicius, Copper Mountain Metro District</p> <p>Deborah Polich, ?</p> <p>Karn Stiegelmeier, Board of County Commissioners</p> <p>Scott Winter, Colorado Springs Utilities</p> <p>Lane Wyatt, NWCCOG</p>
<i>Key</i>	
<i>Black = confirmed</i>	
<i>Red = needs confirmation</i>	

SUMMARY OF GOALS

- **Overarching:** Reduce outdoor water use while maintaining aesthetics for visitor and resident appeal
- **2018:** Focus on low-cost/no-cost water savings opportunities and customer education and outreach
- **2019-2021:** Design and implement regional programs aimed at outdoor water efficiency, including outdoor water audits, irrigation system optimization, and landscaper certification

STRATEGIES TO ACHIEVE GOALS

Strategy 1: Customer outreach and education

- Identify largest users (for example, HOAs)
 - Work with customers to better schedule their water use
- Work with landscape companies
 - Create a list of water-efficiency minded landscapers
 - Educate additional landscape companies
- Identify educational events, for example one county-wide meeting
 - Annual State of the River
 - NWCCOG QQ meetings
- Educate about joint energy-water savings opportunities
- Develop water budgets using GIS and irrigated lands analysis for customer outreach about the amount of water customers should be using
- Work with City Parks staff on water savings opportunities
- Send out a mailer to contract holders about metering and plantings



Strategy 2: Develop an outdoor water efficiency audit program

- Evaluate existing programs for best practices and lessons learned (for example, Denver Water)
- Identify potential service providers (for example, Resource Central Slow the Flow program)
- Design and implement a pilot program
- Implement a regional program

Strategy 3: Develop an outdoor water efficiency system optimization program

- Evaluate existing programs for best practices and lessons learned
- Identify potential service providers (for example, irrigation companies)
- Design and implement a pilot program
- Implement a regional program

Strategy 4: Develop a landscaper certification program

- Evaluate existing programs for best practices and lessons learned
- Evaluate working with the Irrigation Association
- Design and implement a pilot program
- Implement a regional program

Strategy 5: Evaluate municipal code for updates regarding vegetation requirements

- Coordinate efforts with the land use planning working group

SUMMARY OF ASSIGNED ACTION ITEMS

Action Item	Responsible Team Member	Due Date



APPENDIX D: RESOLUTION TO ADOPT PLAN
