



TOWN OF  
BRECKENRIDGE

# WATER EFFICIENCY PLAN

June 2018



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Developed in partnership with:



# 1 EXECUTIVE SUMMARY

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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 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.*

The Town of Breckenridge's water efficiency plan is an update to the Town's 2004 water conservation plan and documents the Town's existing and planned actions to ensure system reliability and the efficient use of available water supplies.

## 1.1 WHERE WE ARE NOW

The Town of Breckenridge receives its water supplies from the Blue River and its tributaries. The Town is committed to maintaining flows in the Blue River that are environmentally beneficial, while continuing to serve customers efficiently and effectively.

The Town sells potable water to residential and commercial customers and raw water to the ski resort. Non-revenue water uses include firefighting, municipal uses (golf course and park irrigation, Town projects, street sweeping), hydrant flushing, system leaks, construction water, and other bulk water that is metered but not billed.

Outdoor water use represents a relatively small percentage (15%) of total annual demands, but results in high demand peaks during summer months. The Town also experiences a slight increase in demands from November - March due to the influx of transient residents and day visitors during ski season.

Historically, the Town has had issues with system leaks, which, in combination with hydrant flushing, non-metered use, and malfunctioning meters, have led to relatively high amounts of non-revenue water. For example, in 2015-2016, estimates of non-revenue water ranged from 13-21% annually.

In 2016, the Town produced 1,815 ac-ft of potable water. Almost three-quarters of the annual potable water sales served the residential sector, while 20% served commercial customers and the remaining sales served government and irrigation accounts. Since 2000, the Town has experienced an average decline of 1.4% year-over-year in annual water production volumes. Normalizing for population growth, the Town has seen a 3.1% decline on average year-over-year, with systemwide water use of 146 gallons per single family equivalent in 2016. Non-potable sales for snowmaking are relatively constant at 400 ac-ft/yr.

The Town has achieved past reductions in water use through the implementation of various demand management activities, including:

- An automatic meter reading system installed in 2005
- A system water loss and management control program, including leak detection audits

- An inclining block rate structure that provides some incentive for conservation
- An outdoor water conservation ordinance
- Indoor efficiency through local plumbing codes and State fixture requirements
- Conservation efforts at Town facilities, including turf replacement at the recreation center
- A business recognition program that encourages sustainable actions by local businesses
- Public outreach and education efforts

## 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 Town aims to implement additional water efficiency activities to supplement existing activities to achieve the following goals:

- A 10% reduction in annual demands by 2025, compared to 2016 demands.
- A reduction in peak demands during the summer associated with outdoor water use.

## 1.3 HOW WE WILL GET THERE

New water 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, customer sectors and end-uses impacted by the measure, and implementation costs.

Water Efficiency Activity	Sectors Impacted	Implementation Period	Projected Water Savings in 2025
<b>Foundational Activities</b>			
Billing Upgrades	All Customers	2018-Ongoing	2 ac-ft/yr
Advanced Metering Infrastructure and Enhanced Water Loss Control	All Customers	2020-Ongoing	115 ac-ft/yr
Conservation-Oriented Rates	All Customers	2019-Ongoing	123 ac-ft/yr
Institutional Collaboration	Utility	2017-Ongoing	Not Quantified
<b>Targeted Technical Assistance and Incentives</b>			
Indoor Water Efficiency	Residential	2018-Ongoing	1 ac-ft/yr
Outdoor Water Efficiency	Residential & HOA	2019-Ongoing	10 ac-ft/yr
<b>Ordinances and Regulations</b>			
Land Use Planning	All Customers	2017-Ongoing	Not Quantified
<b>Education Activities</b>			
Education and Outreach	All Customers	2018-Ongoing	Not Quantified
<b>Total Savings in 2025</b>			<b>251 ac-ft/yr</b>

## 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 Town achieve its goals. The action plans specify goals, strategies, action items, timelines, and resources for each activity.



## 2 ACKNOWLEDGEMENTS

The Town of Breckenridge would like to thank the following staff members and stakeholders who contributed to this water efficiency plan:

### Town of Breckenridge

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### High Country Conservation Center

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### Middle Park Conservation District

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Zach Margolis  
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Julie Stennes

### Brendle Group

Becky Fedak  
Derek Hannon  
Becca Stock  
Amy Volckens

### Other Stakeholders

Alan Bacher – Summit Chamber of Commerce  
Woody Bates – Summit County School District  
Graeme Bilenduke - Copper Mountain Resort  
Alan Blado – Liquid Descent Rafting  
Abbey Browne – WoodWinds Property Management  
Kevin Byrne – Vail Resorts  
Mark Cassalia – Denver Water  
Shellie Duplan – Buffalo Mountain Metro District  
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Matt Willits – Water Solutions Inc.  
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## 3 INTRODUCTION

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Water has long been a vital resource to the economy and the culture of the Town of Breckenridge (Town) and surrounding areas:

- In 1859, gold was discovered along the Blue River, kicking off the gold rush in Summit County.
- In 1961, the Breckenridge Ski Area officially opened.
- In 2004, the Town developed its first water conservation plan (TOB 2004).
- In 2011, the Town adopted the SustainableBreck Plan to “further the goals of the Town’s Vision Plan through developing recommendations for environmental, economic, and social sustainability (TOB 2017a)”. For water, the Town seeks to conserve water, maintain high standards of water quality, and increase its ability to fully store available water rights to ensure an adequate water supply for future generations.
- In 2014, the Town Council identified water conservation as one of five top priorities for the year.

This water efficiency plan is an update to the previous water conservation plan in documenting the Town’s existing and planned actions to ensure system reliability and the efficient use of available water supplies. Related planning efforts for the Town include:

- A feasibility study for a new water treatment plant that included examination of the Town’s current and expected water demands compared to the capacity of the existing system. A second water treatment plant and distribution system upgrades were recommended for the Town from this study (HDR 2014).
- A five-year capital improvement plan that includes infrastructure improvements for the water system (TOB 2017b).
- A Water Master Plan that the Town’s Water Division updates each year to document water production and changes to the service population.

### 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 Town of Breckenridge has remained below that threshold in recent years, the Town, 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 Town’s history of water saving activities and future plans. The Town also seeks to leverage regional partnerships to effect change and encourage all residents and visitors to reduce water use.

### 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.

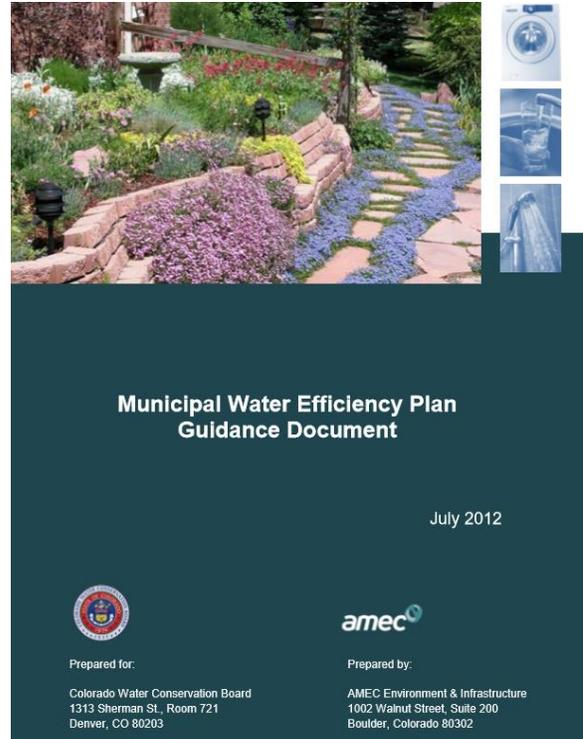


Figure 1. State of Colorado Municipal Water Efficiency Plan Guidance Document



### 3.3 OUR WATER VISION

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

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#### VISION STATEMENT

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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

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### 4.1 BOUNDARIES

The Town of Breckenridge was founded as a small mining camp in 1860 during the gold rush but has since evolved into a popular destination for skiers and summer recreationalists. The Town encompasses 5.3 sq mi in the Upper Blue River watershed on the west slope of the Continental Divide.

The Town provides water services to its incorporated area and adjacent unincorporated areas (including Summit County High School). In December 1995, the Blue River Water District was consolidated into the Town of Breckenridge. The District's water rights, facilities, and service area were transferred to the Town at that time (NWCCOG 2004). **Figure 2** shows a map of the current water service area.

Due to the proximity of federal lands, and the high degree of buildout on the surrounding unincorporated areas, there is limited potential for the Town to expand its borders. Projected growth is expected from infill and redevelopment more than expansion.

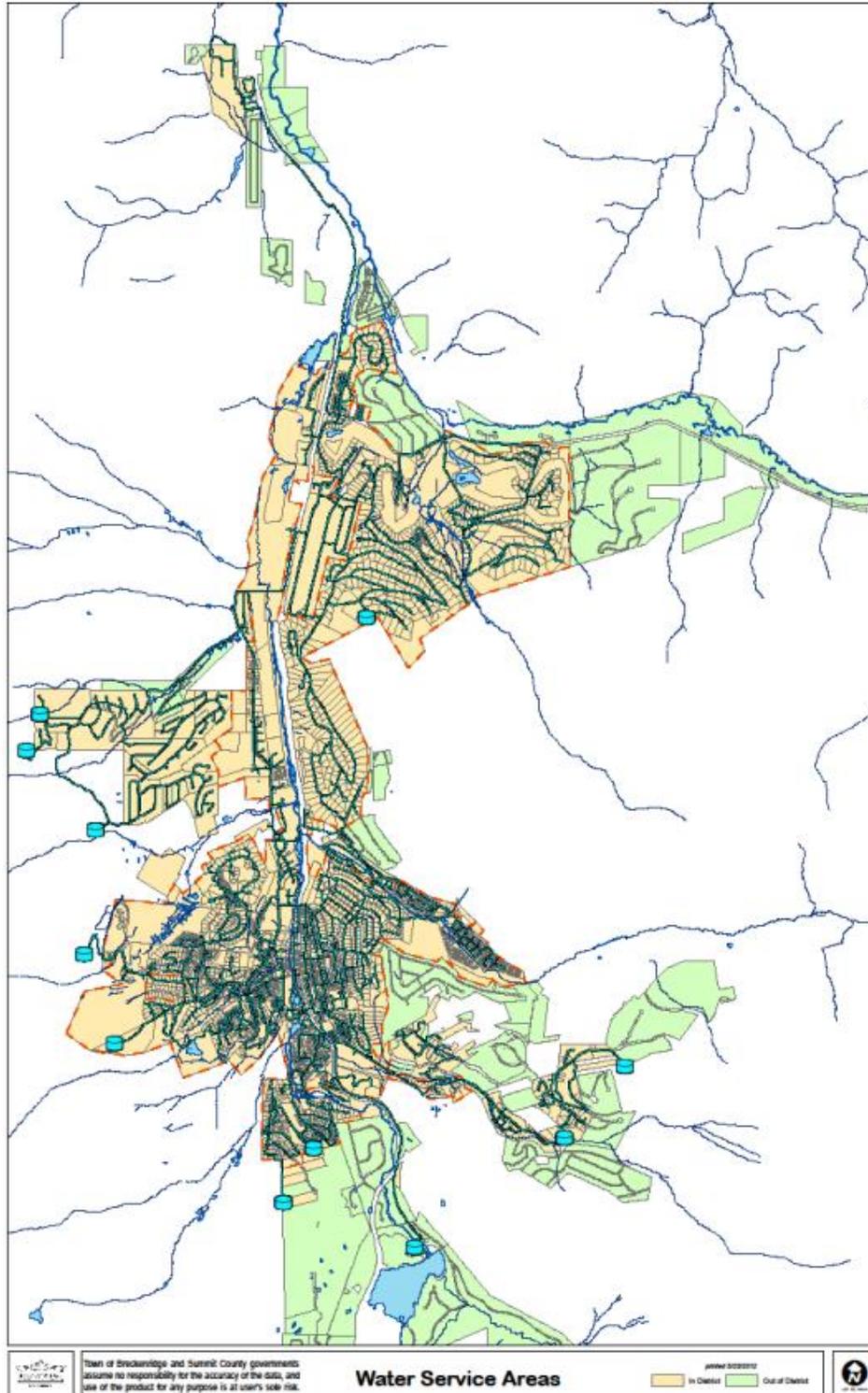


Figure 2: Town of Breckenridge Water Utility Service Area

## 4.2 POPULATION

Breckenridge is best known for the ski resort and attracts many visitors. As such, tourism in the area introduces a high degree of seasonality and variability into the service population. The Town estimates three service population pools:

- The permanent service population, which includes Town residents plus people living outside Town limits but served by the municipal water supply system.
- Day visitors, which are defined as visitors that do not stay overnight.
- The transient population, which is defined as visitors that stay overnight.

It is difficult for the Town to estimate the visiting population served. **Figure 3** presents a breakdown of the 2010 estimated service population of 42,547 into these three population pools. Looking forward, the Town anticipates that the permanent service population and transient population will grow on average by 2.2% each year (HDR 2014). The Town assumes 0.3% average annual growth in the day visitor population served.

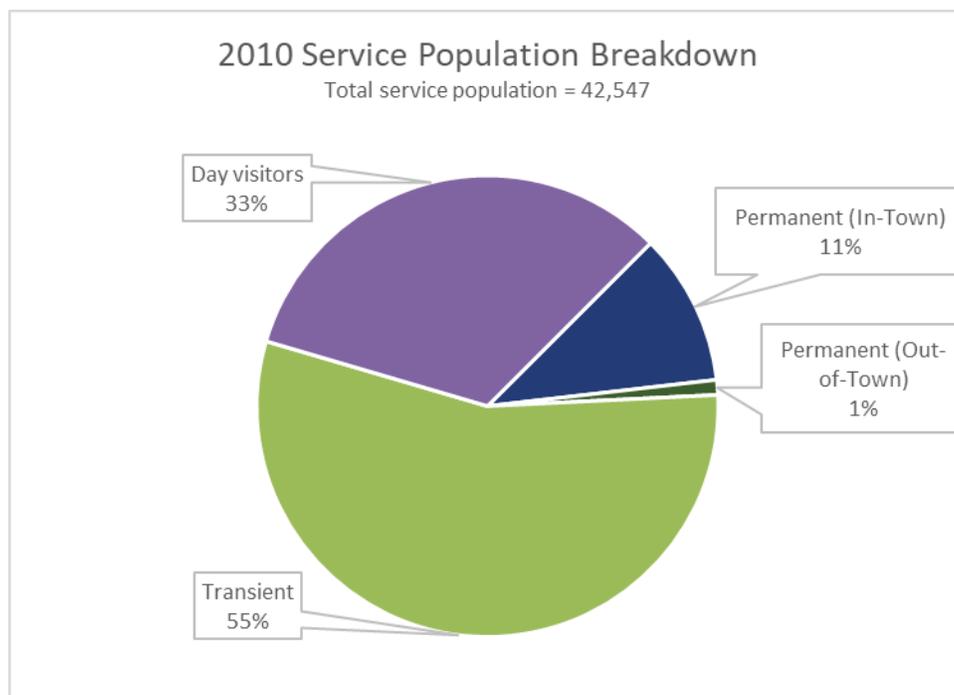


Figure 3. 2010 Service Population Breakdown

The Town also uses Single-Family Equivalents (SFE) as the basis for utility capacity planning efforts and as another measure of service area growth. For the residential sector (including single-family homes and duplexes), 1 SFE covers up to 2,000 sq ft. Each additional square foot adds 0.00016 SFE. In the residential sector, a good rule of thumb is 3 people/SFE to approximately convert between population and SFE. In the commercial sector, buildings are assigned SFE values based on a variety of factors depending on the business type (TOB 2017d). Since 2003, total SFE values in the Town have increased by 1.8% on average year-over-year (**Figure 4**).

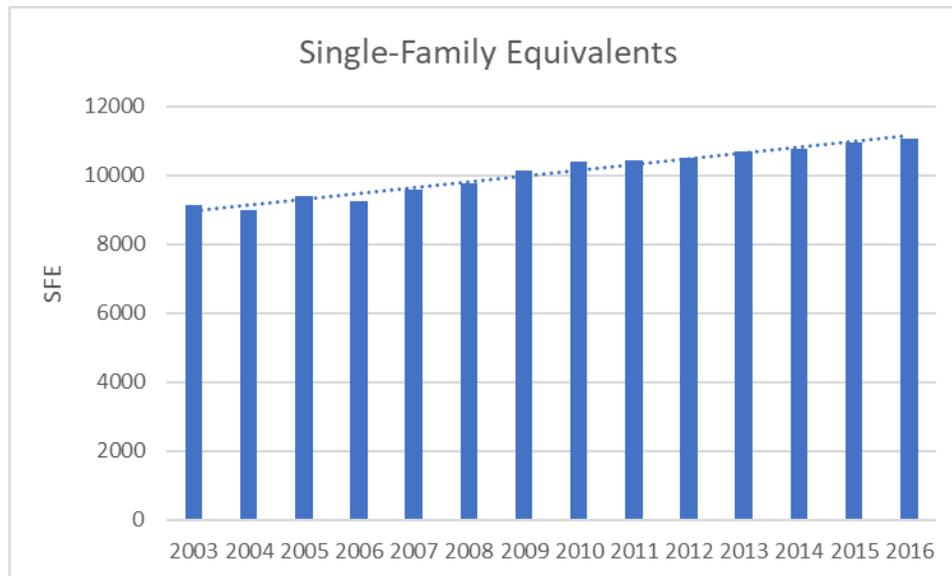


Figure 4. Total (Residential and Commercial) Single-Family Equivalents (2003-2016)

### 4.3 RESIDENTIAL SECTOR

Housing in the Town reflects the characteristics of a recreational destination. Approximately 69% of the available housing units are designated as multifamily housing (ACS 2015). The remaining housing units are single-family detached (22%) and single-family attached (9%) homes. The average home age is about 30 years old.

Older buildings in the Town represent an opportunity for indoor water savings through the replacement of indoor fixtures and appliances. The high proportion of multifamily units and the transient population represent challenges for water education and outreach efforts. The Town aims to engage and influence the visiting population to effect long-lasting water savings.

### 4.4 COMMERCIAL AND INDUSTRIAL SECTOR

The largest employment sectors in Breckenridge are the entertainment, food services, and accommodations associated with the ski resort, which provides about 40% of the 2,819 jobs in the Town (ACS 2015).

## 5 EXISTING WATER AND WASTEWATER SYSTEM

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### 5.1 RAW WATER SUPPLIES

The Town of Breckenridge has a diverse portfolio of water rights that includes direct streamflow rights, storage rights, and augmentation water. All water supplies come from the Blue River and its tributaries. The Town has three points of diversion:

- Water diverted from the Blue River at Goose Pasture Tarn (an 800 ac-ft reservoir located on the Blue River upstream of Town) is sent to the primary water treatment plant and serves most of the service area demands, including snowmaking deliveries to the ski area. The Town has senior water rights dating back to 1885 to divert 4.87 cfs at this location.
- The Town has junior rights to divert water from South Barton Gulch to the Peak Seven Water Treatment Plant, which was acquired from the Blue River Water District and serves the former District's service area. The plant has been inactive since 2004 but can be operated to provide water in an emergency if needed.
- Water diverted from the Swan River near its confluence with the Blue River is used for irrigation water for the Town's golf course.
- The Town will have an alternate point of diversion on the Blue River near Swan Mountain Road for the new water treatment plant that will be online in 2020.

For storage rights, the Town owns (NWCCOG 2004):

- 400 ac-ft of storage in the Goose Pasture Tarn
- 50 ac-ft of water in the Upper Blue River Reservoir, upstream of the Tarn, that is available for use between April and November
- 12 ac-ft in Sawmill Reservoir
- 800 ac-ft in Green Mountain Reservoir
- 130 ac-ft in Clinton Reservoir
- 100 ac-ft in Windy Gap Reservoir

Based on current development projections, the Town estimates that treated water demands at buildout will be 3,506 ac-ft/yr and that raw water demands will be continue at current levels of approximately 520 ac-ft/yr for snowmaking and golf course irrigation (NWCCOG 2004). The Town's current water rights portfolio is sufficient to meet demands through buildout.

The Town of Breckenridge is committed to maintaining flows in the Blue River that are environmentally beneficial and has signed an agreement with the CWCB to establish minimum instream flow levels. To help the Town meet the instream flow requirements, while still being able to maximize use of water rights during low flow periods, the Town obtained a conditional decree for 2 cfs that allows water to be diverted from the Miners Creek Ditch to the Blue River upstream of the instream flow gage.

## 5.2 TREATMENT AND DISTRIBUTION

### 5.2.1 Potable Water

The Town's primary water treatment plant (Gary Roberts WTP) was built in the 1970s and has the capacity to produce 5 MGD. Conventional treatment processes are used to produce water that meets drinking water standards. This plant is expected to meet the needs of the Town through at least 2026 (HDR 2014).

The Peak Seven WTP has historically been used to provide water to the Peak Seven neighborhood, but the water source is unreliable during low flows. As a result, the plant has been inactive since 2004 but can be operated to provide water in an emergency if needed. The plant's capacity is 0.5 MGD, although production is generally limited to 0.25 MGD from October-April based on streamflow availability (NWCCOG 2004).

The water system is gravity fed from the Goose Pasture Tarn Reservoir, with the option to pump into the Gary Roberts WTP from the reservoir spillway pool. The distribution system comprises 100 miles of pipeline in 16 pressure zones (**Figure 5**). The pressure zones are served by 10 pumping stations, eight of which are associated with storage tanks and two of which are used to augment system pressures. Each of the pumping stations has operational redundancy. Because of the elevation change, the system can have some issues with high pressures in the lower valley neighborhoods. The distribution mains are equipped with pressure-reducing valves. All customers in these areas are required to have pressure-reducing valves as well.

The Town has a total treated water storage capacity of 7.5 MG in eight storage tanks. The combined storage is sufficient to meet system needs for 24 hours on a peak day with fire demand and to meet peak hourly demands (TOB 2004).

### 5.2.2 Non-Potable Water

The Town distributes raw (non-potable) water for snowmaking and municipal golf course irrigation. Snowmaking is limited to 400 ac-ft/yr and by water rights can only be used between October 1st and January 31st of each year.

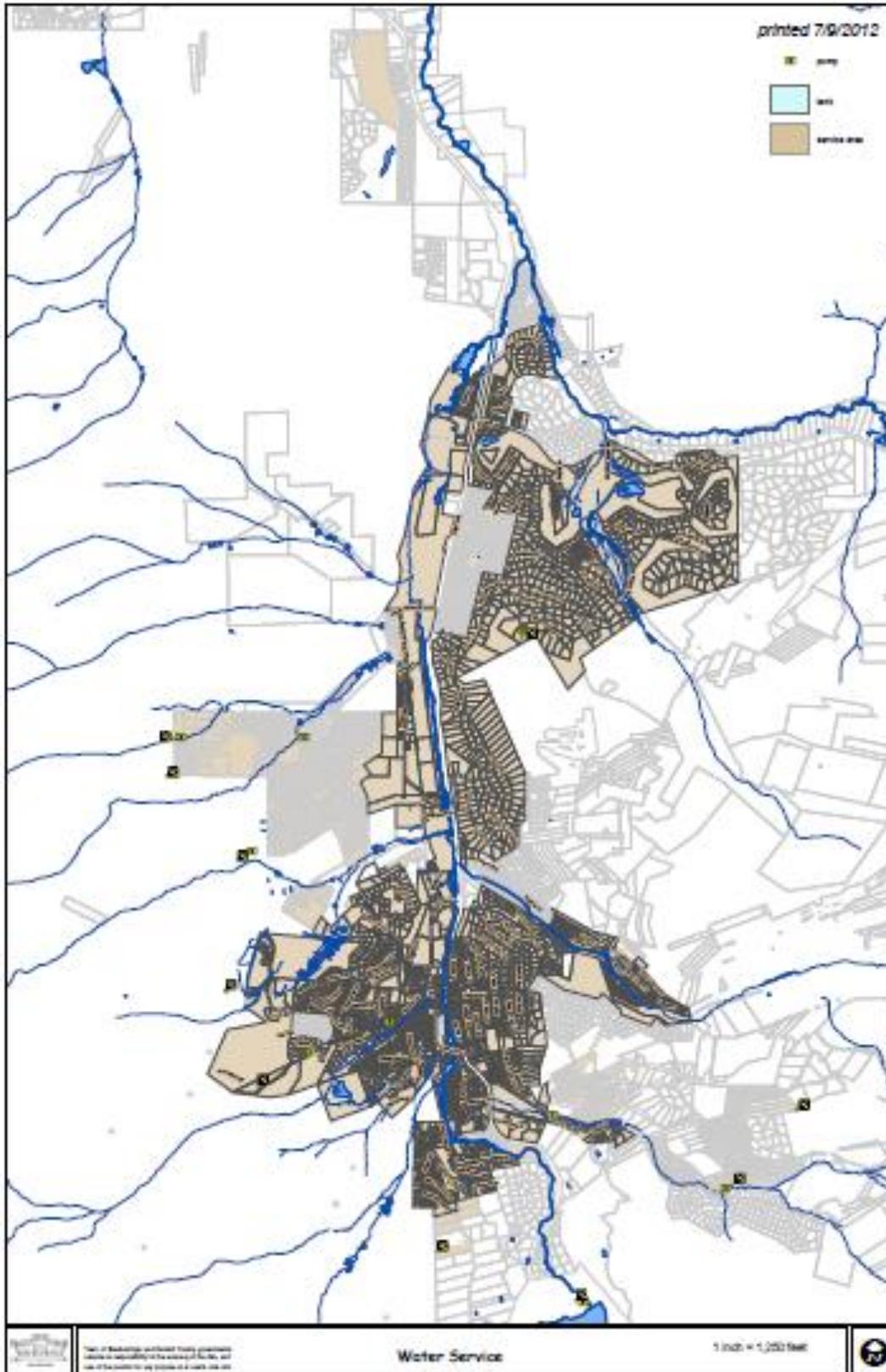


Figure 5: Water Distribution System

### 5.3 WATER SALES AND NON-REVENUE WATER USES

The Town of Breckenridge sells potable water to residential and commercial customers and raw water to the ski resort. Non-revenue water uses include firefighting, municipal uses (golf course and park irrigation, Town projects, street sweeping), hydrant flushing, system leaks, construction water, and other bulk water that is metered but not billed. More information on non-revenue water is included in **Section 0** as part of the discussion on historical system demands.

### 5.4 WATER RATES AND BILLING

In 2001, the Town adopted an inclining block rate structure to discourage excessive water use. The water pricing structure was last adjusted in 2014 to reduce the base usage allotment (from 12,000 gal to 10,000 gal) and to increase the price for use above the base allotment. Both changes were intended to encourage water conservation.

The price that customers pay for their water is a function of customer type (residential or non-residential), building size, and service location. The pricing structure is based on SFE values. Non-residential (commercial) rates and usage allowances are defined additionally by the water tap size. Customers outside of Town limits pay more than customers within Town limits. The 2017 water rates for residential and commercial customers are shown in **Table 1** and **Table 2**, respectively. Customers are billed every two months for their water use. Rates are adjusted each year based on debt, operations, and capital obligations.

Table 1: 2017 Residential Water Rates

Pricing Tier	Pricing Rate (per SFE per billing period)	
	In-Town	Out-of-Town
Base Rate (Use < 10 kgal)	\$36.17	\$54.26
Use > 10 kgal	\$5.51/kgal	\$8.27/kgal

Table 2: 2017 Non-Residential (Commercial) Water Rates

Pricing Tier	Tap Size	Usage allowance	Pricing Rate (per SFE per billing period)	
			In-Town	Out-of-Town
Base Rate (based on tap size)	<1"	13 kgal	\$41.43	\$62.15
	1"	20 kgal	\$62.15	\$93.23
	1.5"	35 kgal	\$108.45	\$162.68
	2"	54 kgal	\$170.77	\$256.16
	3"	105 kgal	\$328.36	\$492.54
	4"	162 kgal	\$507.60	\$761.40
	6"	318 kgal	\$997.33	\$1,493.00
Use over allowance			\$3.11/kgal	\$4.66/kgal

The Town has a contractual agreement with the Breckenridge ski area that sets the terms for storage of 100 ac-ft and delivery of an additional 300 ac-ft of snowmaking water, for a total of 400 ac-ft. The contract expires in 2025.

## 5.5 WASTEWATER COLLECTION AND TREATMENT

Most of the Town's wastewater flows are treated by the Upper Blue Sanitation District (formerly the Breckenridge Sanitation District), a special district that is independent of the Town of Breckenridge.

## 5.6 SYSTEM RELIABILITY, LIMITATIONS, AND FUTURE NEEDS

### 5.6.1 Reliability

The Town's water system is highly reliable. The Town has never suffered from a loss of water supply or a failure to meet system demands, even during the significant droughts that occurred in 2002 and 2012. The Town's water rights portfolio and current treatment and distribution system have the capacity to serve 104% of the projected system demands at buildout during a dry year in the winter at peak population (TOB 2004). The pumping stations and treatment plant have redundancy with the pumps and other mechanical equipment.

### 5.6.2 Vulnerabilities

#### 5.6.2.1 Wildfire

The Town's sole source of water is surface water, which is vulnerable to the effects of wildfires. When they do occur, wildfires create a triple threat to surface water quality:

- They increase the amount of rainfall during a storm event that is available for runoff. Wildfires burn vegetation whose canopy would normally intercept rainfall and whose roots would uptake water.
- They increase pollutant loads during subsequent storm events. Wildfires leave large amounts of debris and surface disturbances in their wake. In addition to the debris and sediment loads clogging intake infrastructure, source waters often experience spikes in turbidity, coliforms, total organic carbon, iron, manganese, and ammonia.
- They increase the surface runoff that occurs from subsequent storm events. Wildfires affect topsoil properties, making ground surfaces hydrophobic, so that water runs off rather than being infiltrated.

Wildfires can also affect the available quantity of water, if debris constricts water flow or alters the river channel.

The WTP feasibility study conducted for the Town recommended the development of a wildfire response plan (HDR 2014). A follow-up study found that two factors may help protect the Town's water supply system in the event of a wildfire (Tetra Tech 2015):

- There is generally enough time between wildfire season and spring runoff season to implement measures that mitigate runoff and erosion.
- The availability of a second WTP downstream of the current WTP may allow for additional sediment and debris settling in the river channel, reducing influent contamination.

In 2017, the Town entered into a memorandum of understanding with the US Forest Service for the development and implementation of a pre-fire vegetation management plan (TOB 2017e). The plan will identify forest health and restoration treatments aimed at reducing wildfire risks and protecting source water quality.

#### 5.6.2.2 Drought

Summit County has experienced significant periods of drought six times in the past 35 years, with the most recent occurring in 2002 and 2012 (AMEC 2013). While the Town has been able in the past to

provide sufficient water supplies to meet demands, droughts have highlighted the need for utility planning to avoid shortages in the future, particularly if a severe, multi-year drought were to occur.

The Town feels confident using Blue River as the sole source of water due to its reliability. Even in recent drought years, the flow rate in the Blue River has been sufficiently high to provide a reliable water source. If needed, the Town of Breckenridge does have raw water storage that serves as a drought mitigation measure. The Town has not had to draw upon these reserves since the WTP was built in the 1970s.

During the 2002 drought, the Town was concerned that low flows in the North Fork of the South Barton Creek would drop too low to continue operating the Peak Seven WTP. Due to this concern, the Town added a pumping station that allows the Peak Seven service area to be served by the Gary Roberts WTP. The Peak Seven WTP was shut down and has been designated as an emergency plant in case of a main break interrupting water delivery from the Roberts WTP.

### 5.6.3 Future Needs

The Town's capital improvement plan includes several projects to maintain and improve the water system. These projects include:

- **Repairing the Goose Pasture Tarn dam.** Concerns about the dam's safety have reduced the working capacity of the reservoir from 800 ac-ft to 567 ac-ft. Dam repairs are the highest priority for the Town and should be completed by 2022.
- **Repairing storage tanks.** In 2017-2021, the Town will work to rehabilitate several storage tanks.
- **Building a second water treatment plant.** The Town intends to build a second WTP to augment the Gary Roberts WTP to improve system redundancy. The new plant is expected to be completed by 2020. The treatment plant will be located downstream of the Gary Roberts WTP and also downstream of the confluences of several tributaries with the Blue River. This location is expected to provide additional resilience to the system in response to drought and climate change impacts. The new plant will have a capacity of 3 MGD, with the possibility of increasing to 4.5 MGD in the future and can serve the needs of the entire system if needed during certain times of the year. As the new treatment plant comes online, potential customers outside of the current service area who are near water mains will be able to apply to be on the Town's water service. Petitions will be considered by Town Council on a case-by-case basis.
- **Rehabilitating the existing water treatment plant.** The Gary Roberts WTP is currently being serviced to repair a leaking flocculation chamber. After the new WTP begins operating, the Town intends to shut down the plant for a full rehabilitation that will take approximately five years, estimated to take place from 2021-2025.
- **Replacing cast iron mains.** When the Town took over Blue River Water District, part of the acquisition included cast iron water mains that were installed without proper bedding. The Town typically experiences 3-5 leaks per year from these mains. The Town has already replaced or lined some of these mains and intends to continue replacing the mains over a five-year period starting in 2022.

## 6 HISTORICAL WATER DEMANDS AND DEMAND MANAGEMENT

### 6.1 HISTORICAL WATER DEMANDS

The Town 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 Water Use

Annual water production volumes for the period 2000-2016 are shown in **Figure 6** (TOB 2017c). The values have not been normalized for weather or other factors that affect water demands from year to year. The Town has experienced an average decline of 1.4% year-over-year in annual water production volumes over this period. Peak annual production occurred in 2008 at about 2,400 ac-ft and has been consistently lower since then.

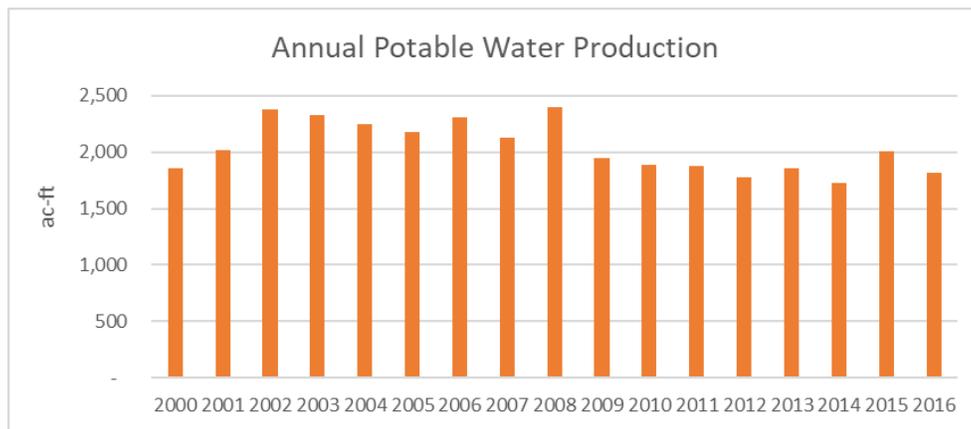


Figure 6. Annual Potable Water Production (2000-2016)

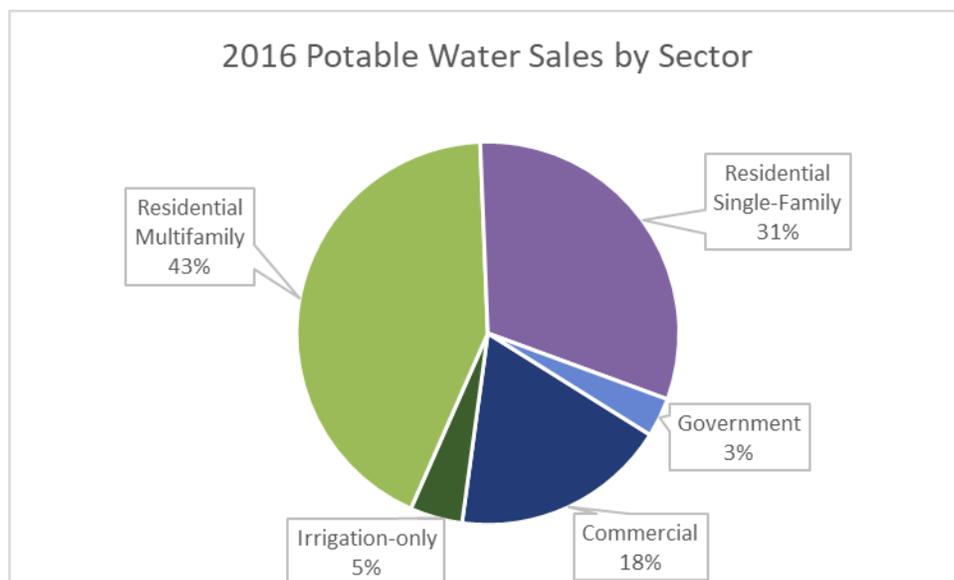


Figure 7: 2016 Potable Water Sales by Sector

**Figure 7** presents a breakdown of water production by customer type for 2016. The Town tracks water uses in six sectors:

- **Residential Single-Family:** Total residential use represents 74% of the total water use in Breckenridge. Water use in the single-family sector accounts for 31% of the total use.
- **Residential Multi-Family:** Water use in the multifamily sector accounts for 43% of the total use. Condominiums and the resorts at the base of the ski mountain are billed under the multi-family residential rates, even though there may be small commercial spaces included on the water meter. The largest water users in the residential sector tend to be multi-family buildings, especially if the buildings are mixed use and include restaurants.
- **Irrigation-only:** The irrigation-only sector (5% of total water use) represents outdoor use that is on a separate irrigation meter, including the Town’s irrigation and some irrigation demands from multifamily housing. While the Town encourages all developments to install separate irrigation meters, most irrigation use is captured in the residential and commercial sector values.
- **Commercial:** Commercial customers account for about 18% of the total water use. The largest water users in the commercial sector include multi-use or multi-tenant commercial buildings, especially those that include restaurants, laundry facilities, or public restrooms. Other top commercial users include stand-alone restaurants and laundry facilities.
- **Government:** The Town tracks government use separately (3% of total water use). This sector includes use by the Town of Breckenridge and Summit County.

Annual production volumes, potable water sales, and potable sales by sector for the period 2011-2016 are summarized in **Table 3**. Additional data are included in **Appendix A: Plan Data**.

*Table 3: Summary of Production, Total Potable Sales, and Potable Sales by Sector*

Year	Total Production (ac-ft)	Total Sales (ac-ft)	Residential Single-Family Sales (ac-ft)	Residential Multi-Family Sales (ac-ft)	Irrigation-only Sales (ac-ft)	Commercial Sales (ac-ft)	Government Sales (ac-ft)
2011	1,878	n/a	1,196		n/a	n/a	n/a
2012	1,779	n/a	1,226		n/a	n/a	n/a
2013	1,853	n/a	1,310		n/a	n/a	n/a
2014	1,731	1,596	747	478	63	308	0
2015	2,006	1,582	654	566	63	299	0
2016	1,815	1,640	512	701	73	300	54

\*n/a = data not available

\*\*only combined residential sales data are available for the period 2011-2013

\*\*\*The Town also provides 400 ac-ft/yr of raw water for snowmaking.

### 6.1.2 Seasonal Water Use Patterns

Since 2014, outdoor water use has represented a relatively small percentage (15%) of annual demands. This estimate includes billed use from dedicated irrigation meters plus a seasonal analysis of combined meters to estimate outdoor use (**Figure 8**). Small increases in water use that occur November-March (7% of annual demands) are driven by the influx of transient residents and day visitors during ski season. More than 77% of annual demands represent indoor water use by commercial and residential customers.

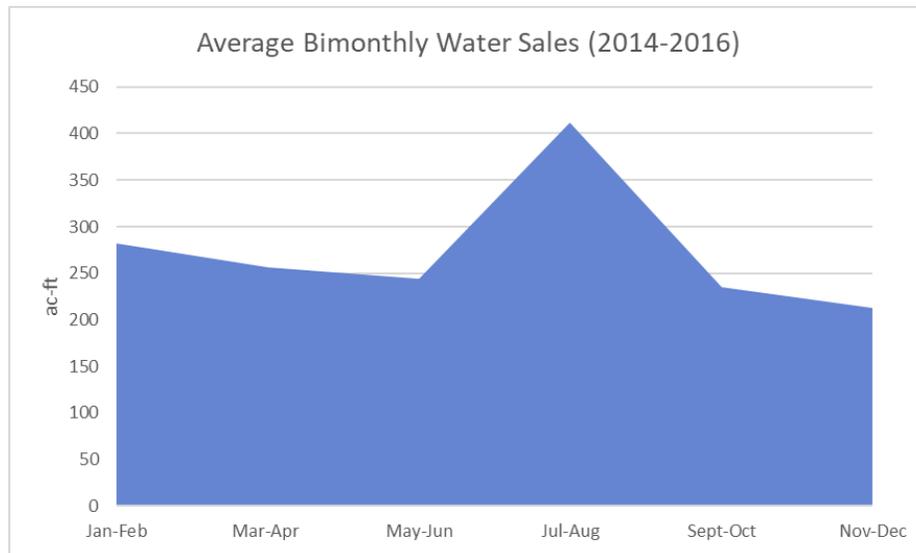


Figure 8: Average Bimonthly Water Sales (2014-2016) – Excluding Snowmaking

### 6.1.3 System Consumptive Uses and Return Flows

Consumptive use represents the portion of the water demands that are removed from available supplies without returning to the watershed. Examples of consumptive use include evapotranspiration from irrigated lands and evaporation from indoor appliances. **Table 4** presents a summary of monthly consumptive use estimates for the Town’s water supply (NWCCOG 2004).

Table 4. Monthly Consumptive Use (CU) and Return Flow (RF) Estimates (NWCCOG 2004)

Month:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
% CU	5%	5%	5%	5%	17%	21%	23%	22%	14%	5%	5%	5%
% RF	95%	95%	95%	95%	83%	79%	77%	78%	86%	95%	95%	95%

Consumptive uses and relative impacts to the watershed were considered during the planning process when selecting future efficiency activities.

### 6.1.4 Non-Revenue Water

Historically, the Town has had trouble with system leaks, including multiple main breaks each year and a long-running line leak under one of the pumping stations that was repaired in October 2017. These leaks, the Town’s hydrant flushing program, and other contributors have led to relatively high amounts of non-revenue water, which is the portion of the water produced but not sold to customers. In 2015-2016, monthly estimates of non-revenue water have ranged from 5-30% per billing period (**Figure 9**), with annual losses of 13-21%. Other contributors to non-revenue water include hydrant flushing, non-metered water use, and malfunctioning meters that don’t properly record water use.

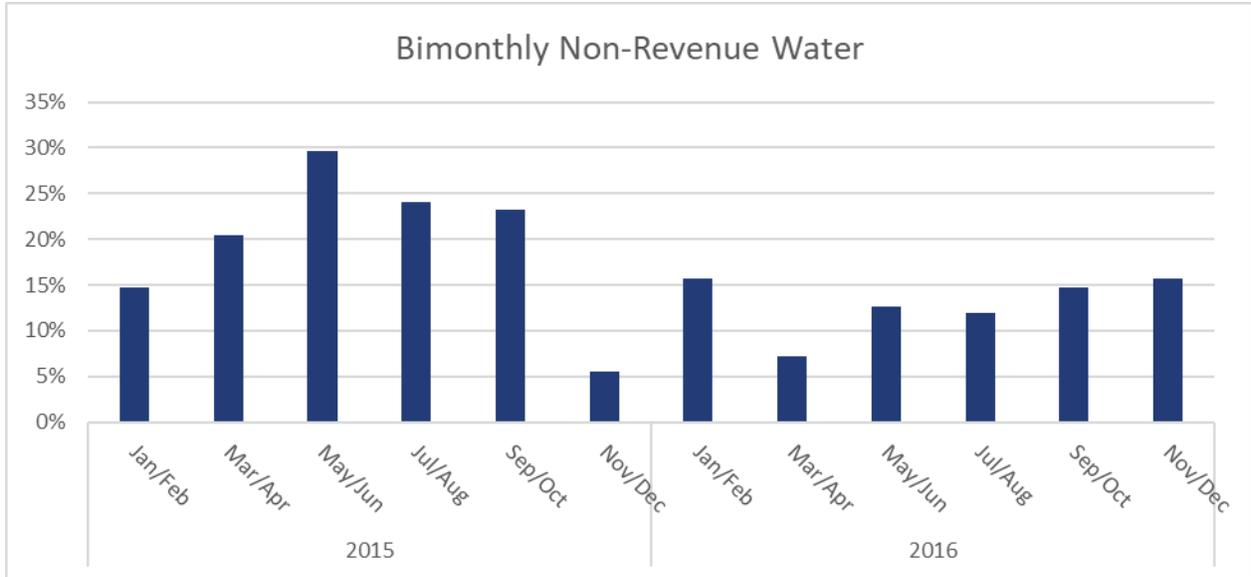


Figure 9: Bimonthly Non-Revenue Water (2015-2016)

### 6.1.5 System-Wide Water Use Metrics

The Town uses system-wide water use metrics to inform water savings estimates and demand forecasts. The Town’s primary metric for assessing system-wide water use is water produced per single-family equivalent per day. As the metric is currently calculated, it includes non-revenue water. Over the period 2003-2016, system-wide per SFE water use in the Town has declined by 3.1% on average year-over-year (Figure 10). The declines experienced in total production and system-wide per SFE water use, having occurred during a time of service population growth, indicate improved water efficiency trends.

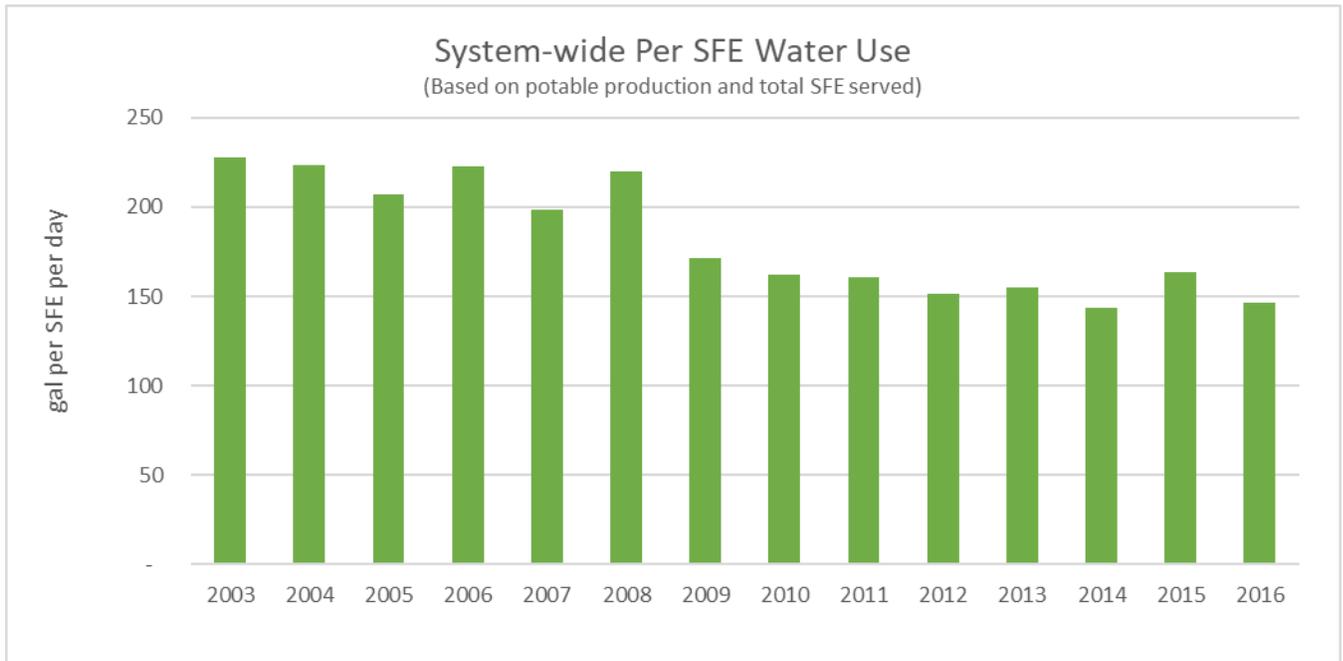


Figure 10: System-wide Per SFE Water Use (2003-2016)

It's worth noting that normalized water use 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):

*[Normalized 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.*

### 6.1.6 Residential Water Use Metrics

The Town's primary metric for assessing residential water use is per capita water use. The Town calculates per capita water use values using residential sales (including both the single-family and multifamily sectors) and the average residential population served, which is estimated at twice the permanent service population to account for the visiting population.

**Figure 11** presents the per capita water use values for the period 2011-2015, which have averaged 104 gpcd during this period.

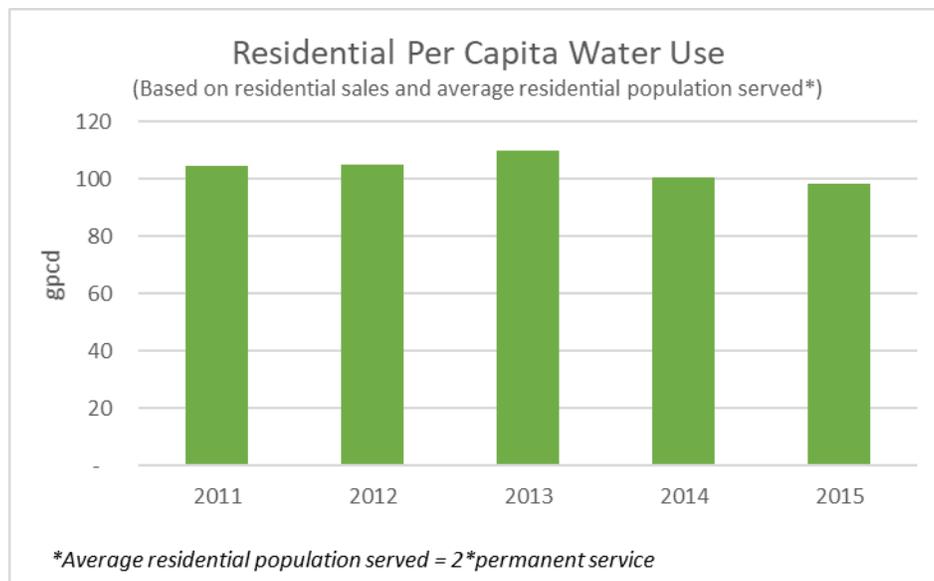


Figure 11: Residential Per Capita Water Use (2011-2015)

## 6.2 PAST AND CURRENT DEMAND MANAGEMENT ACTIVITIES

### 6.2.1 Metering and Data Collection

In 2005, the Town installed an automatic meter reading (AMR) system and replaced all water meters. The meters are read bimonthly to align with the billing cycle.

The Town encourages residential and commercial developments to install separate meters for indoor and outdoor water use to better monitor irrigation use, but only a small number of properties currently have a separate meter. Separate meters for separate uses are also encouraged for mixed-use buildings.

## 6.2.2 System Water Loss Management and Control

Since 1978, the Town has conducted annual system-wide leak detection audits (TOB 2004). Many of these leaks can be difficult to address. Depending on the time of year, ground heaters must be deployed before the pipe can be accessed and repaired. There are also smaller leaks in inaccessible areas (e.g., under pumping stations), that may take several months to access and repair. Because of the relatively high system losses from leaks, the Town invests significant resources in leak detection and upgrading the water mains through linings and replacements. This effort has resulted in fewer leaks – the Town used to get 5-7 leaks per year but now experiences about 3 leaks per year.

Since 2005 when the AMR system was installed, the Town has evaluated customer leaks every two months based on abnormally high bills. Leaking toilets are the most common source of customer leaks.

## 6.2.3 Efficiency-Oriented Rates and Fees

As discussed in Section 5.4, the Town has adopted an inclining block rate structure to encourage water efficiency.

The Town also charges a Plant Investment Fee (PIF) anytime a new structure is built, or an existing structure is substantially remodeled. This fee represents the cost to connect to the Town's water system. The PIF for 2017 is \$7,703 per SFE within Town limits, or \$9,629 per SFE outside of Town limits. The Town's PIF is structured to encourage water efficiency by using building size to determine the total fee. As an additional water-saving incentive, fees for self-service car washes that use recirculating systems are one-half the regular fee (TOB 2004).

## 6.2.4 Water Use Regulations

### 6.2.4.1 Outdoor Water Use

In 2014, the Town of Breckenridge adopted a water conservation ordinance governing outdoor water use (TOB 2014a):

- Outdoor watering for non-drip systems is limited to three days per week at night (during the hours of 5 pm-9 am).
- Car and pavement washing is permitted anytime as long as a hose with a shutoff nozzle is used.
- Exceptions include outdoor watering:
  - By drip irrigation, watering can, or hose with a shutoff nozzle.
  - Of new lawns and landscaping within two years of installation.
  - Of public school property, including athletic fields.
  - Within the Town's public parks.
  - At the Town's municipal golf course.
- Violations of these policies will result in the following fines:
  - 1st violation: Warning only (no fine)
  - 2nd violation: \$250 fine
  - 3rd violation: \$500 fine
  - 4th & each additional violation: \$750 fine

Additionally, the Town's landscape policy in the development code includes incentives for landscaping with native species that can tolerate high-altitude conditions and require little irrigation once established (TOB 2018a). Some of the policy guidelines include:

- Landscaping materials should consist of native species appropriate for the high altitude.

- Landscaping materials should consist of those species that need little additional water (beyond natural precipitation) to survive.
- Native species are the most drought tolerant after establishment. Xeriscaping with native species is encouraged.
- At least 50% of the site area not being used for buildings or other impervious surfaces should be kept in a natural/undisturbed state. Native grasses, wildflowers, and native shrubs are desirable features to maintain.

The Town discourages the use of large areas of sod or other nonnative grasses that require excessive irrigation and do not fit the character of the area, the use of excessive amounts of exotic landscape species, and the removal of specimen trees that could be avoided with an alternative design layout.

#### **6.2.4.2 Indoor Water Use**

The Town encourages indoor water use efficiency through local and State regulations:

- In March 2014, the Town adopted the 2012 Edition of the International Plumbing Code, International Building Code, and International Residential Code (TOB 2014b). The International Plumbing Code specifies maximum flow rate requirements for water fixtures installed during new construction or major redevelopment. The Town has adopted the plumbing codes to apply to any alternation, repair, or replacement of existing systems.
- Additionally, 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 Turf Replacement**

In 2013, the Town replaced the turf on the athletic fields at the Town's recreation center with artificial turf. While the motivation was to make the fields more resilient to heavy use, the replacement also reduced irrigation use at the recreation center.

#### **6.2.6 Business Recognition Program**

In 2013, as part of the SustainableBreck initiative, the Town started a voluntary business certification program to help local businesses become more sustainable while also saving money (TOB 2013). To participate, interested businesses conduct a self-assessment around water use (in addition to energy, waste, transportation, etc.) and then apply to the Town to become a Certified Green Business. In 2016, 38 businesses were actively participating in the program, and 24 businesses had been certified, with six achieving Gold Level certification (TOB 2017a).

#### **6.2.7 Public Outreach and Education Activities**

The Town's website provides water conservation tips including resource links to help customers understand and reduce their water footprint, check for water leaks, and reduce outdoor water use. The Town's Water Division staff also help educate customers about ways to reduce their water use when contacted, usually after receiving a high bill.

#### **6.2.8 Historical Water Savings**

In 2007, the Town conducted an extensive capacity analysis to establish baselines for a number of indicators, including water production. Since the 2007 baseline, the Town has experienced an average reduction of almost 2% on average each year in water production, for a total water savings of 15% over the period 2007-2016 (TOB 2017a).

## 7 WATER EFFICIENCY GOALS AND DEMAND FORECASTS

The Town of Breckenridge is currently using two planning horizons: through 2025 (for the purposes of this water efficiency plan), and through the period 2019-2040, when buildout is expected to occur (HDR 2014).

As part of the preparation of this water efficiency plan, three demand forecasts were developed (**Figure 12**):

- **High growth.** This is a high growth forecast developed using the following assumptions:
  - System-wide per SFE water use of 160 gal/SFE/day.
  - Growth in the service population by 159 SFE/year.
- **Business-as-usual.** This forecast accounts for population growth as well as the trend of historically declining water demands.
- **Active efficiency measures.** With additional efficiency activities implemented in the future, the Town anticipates that a reduction in demands could be achieved, on the order of -2% on average year-over-year.

The demand forecasts diverge in 2018, when implementation of new efficiency activities is assumed to begin. **Appendix A: Plan Data** includes tabular summaries of the demand forecasts.

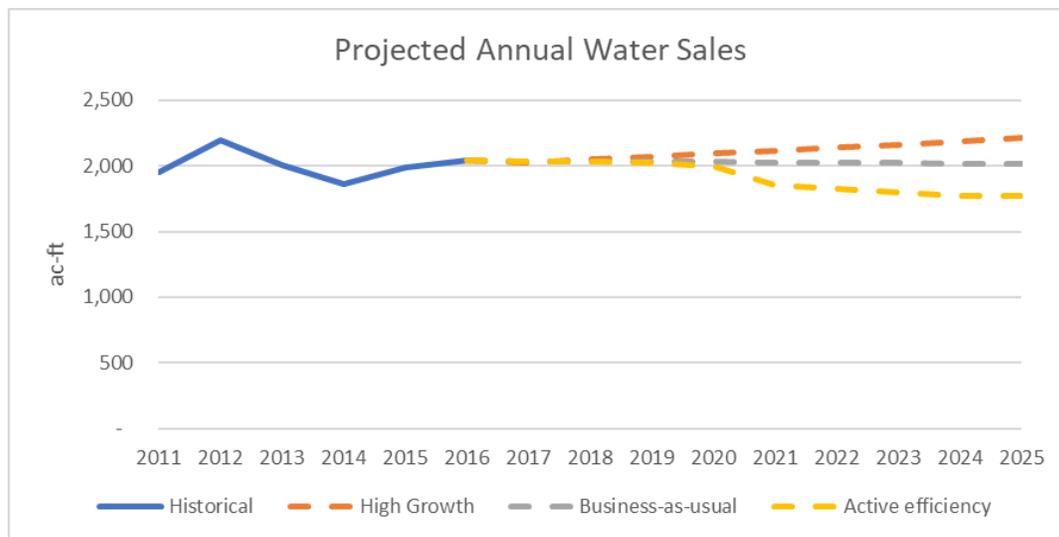


Figure 12: Projected Annual Water Sales (through 2025)

### TOWN OF BRECKENRIDGE WATER EFFICIENCY GOALS

Over the period 2018-2025, the Town aims to implement additional efficiency activities that will build on the downward trend in water use to achieve:

- A 10% reduction in annual demands by 2025, compared to 2016 demands.
- A reduction in peak demands during the summer associated with outdoor water use.

While explicit water quality goals have not been set in relation to these water conservation goals, the Town aims to maintain or enhance existing water quality.

## 8 SELECTION OF ADDITIONAL WATER EFFICIENCY ACTIVITIES

The Town 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 Town aims to implement over the next seven years is shown in **Table 5**.

*Table 5. Summary of Planned Water Efficiency Activities*

Water Efficiency Activity	Sectors Impacted	Implementation Period	Projected Water Savings in 2025
<b>Foundational Activities</b>			
Billing Upgrades	All Customers	2018-Ongoing	2 ac-ft/yr
Advanced Metering Infrastructure and Enhanced Water Loss Control	All Customers	2020-Ongoing	115 ac-ft/yr
Conservation-Oriented Rates	All Customers	2019-Ongoing	123 ac-ft/yr
Institutional Collaboration	Utility	2017-Ongoing	Not Quantified
<b>Targeted Technical Assistance and Incentives</b>			
Indoor Water Efficiency	Residential	2018-Ongoing	1 ac-ft/yr
Outdoor Water Efficiency	Residential & HOA	2019-Ongoing	10 ac-ft/yr
<b>Ordinances and Regulations</b>			
Land Use Planning	All Customers	2017-Ongoing	Not Quantified
<b>Education Activities</b>			
Education and Outreach	All Customers	2018-Ongoing	Not Quantified
<b>Total Savings in 2025</b>			<b>251 ac-ft/yr</b>

### 8.1 FOUNDATIONAL ACTIVITIES

#### 8.1.1 Billing Upgrades

The Town 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 Town assumes that the top 5% of customers (in terms of annual water use) will reduce consumption by 1%. The program is expected to start in 2018 with an estimated cost of \$12,000 per year. Once fully implemented, it is expected to help the Town conserve 2 ac-ft/yr of water. In addition to the quantified water savings, public engagement associated with the report card will be extremely valuable.

#### 8.1.2 Advanced Metering Infrastructure and Enhanced Water Loss Control

Upgrades from AMR to AMI meters are included in the Town’s list of capital improvement projects. Once all meters have been upgraded, the Town should be able to realize additional revenues and to identify customer leaks more effectively. The Town assumes that the program will lead to annual water savings representing 7% of residential and commercial use (115 ac-ft/yr). Most of these savings will be realized

through improved leak detection, while the remainder will be through enhanced customer engagement. The program is expected to cost approximately \$365,000 per year from 2020 to 2025. These costs include capital expenditures as well as increased staff costs associated with customer engagement.

### 8.1.3 Conservation-Oriented Rates

In 2019, the Town will evaluate potential changes to the pricing structure to better incentivize water conservation. The rate study is estimated to cost \$20,000 as an upfront cost with no ongoing costs. Updates to the pricing structure are expected to have the potential to help the Town conserve 123 ac-ft/yr of water. These water savings estimates assume that customers will reduce consumption by an average of 7.5% per year. The Town will only adjust the pricing structure if the changes won't jeopardize revenues or affect financing for the new water treatment plant. Changes to the pricing structure, if made, would take effect in 2020.

### 8.1.4 Institutional Collaboration

This planning process offered an opportunity for Town departments to align around water supply and water conservation planning. In the future, the Town seeks to continue interdepartmental communications and will continue to participate in a regional water conservation committee convened by High Country Conservation Center. Additionally, the Town will work with the Water Task Force to evaluate the impact of water conservation activities.

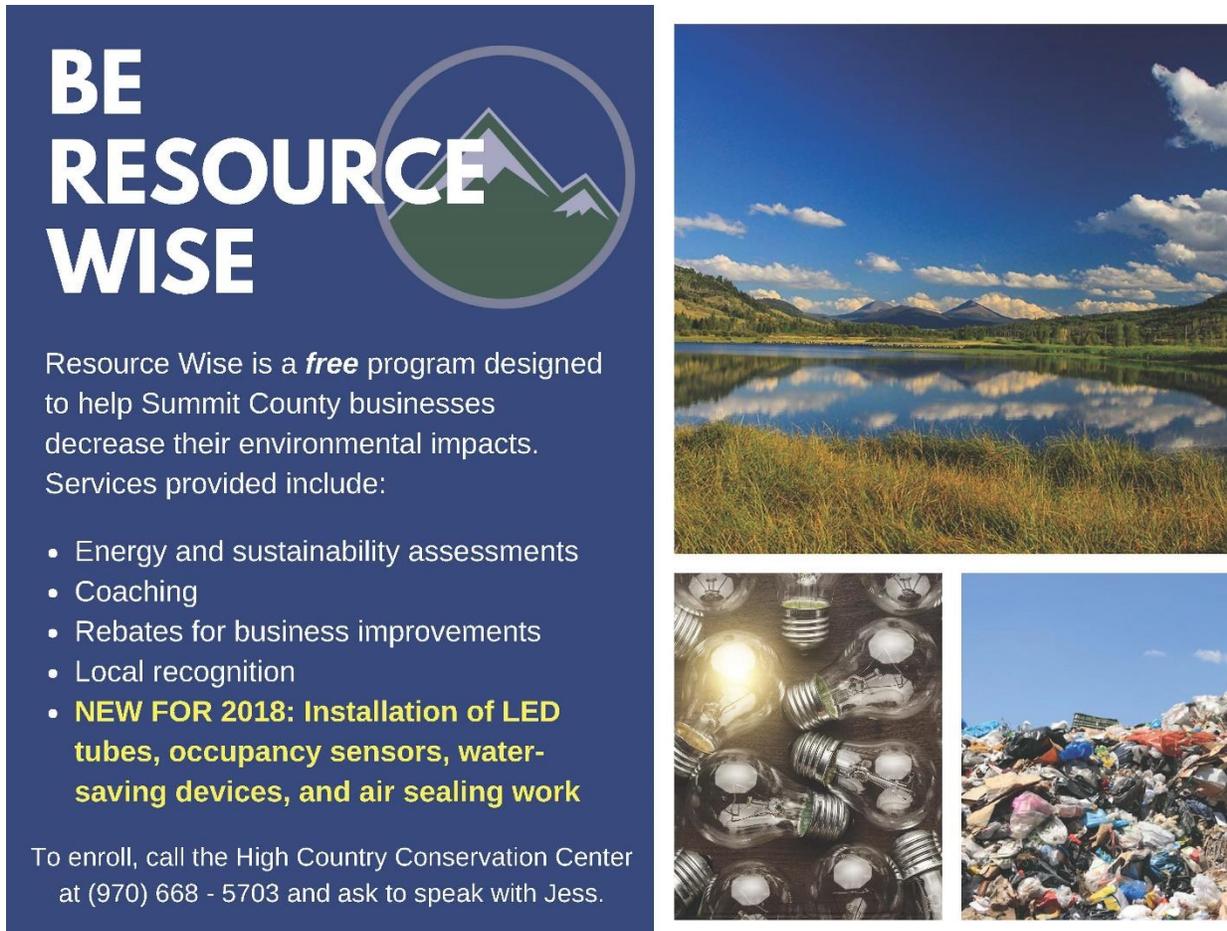
## 8.2 TARGETED TECHNICAL ASSISTANCE AND INCENTIVES

### 8.2.1 Indoor Water Efficiency

The Town intends to promote a regional indoor water efficiency program being developed by a working group and led by High Country Conservation Center. The program is envisioned to include two components:

- Residential indoor water audits that include direct installation of some water-saving fixtures, specifically showerheads and faucet aerators, as well as customized recommendations for additional water savings.
- Commercial outreach through High Country Conservation Center's Resource Wise sustainable business program (**Figure 13**). In addition to providing recommendations on opportunities to save water, High Country Conservation Center can provide direct installs of toilet bricks and pre-rinse spray valves and rebates covering 50% of the cost of water-saving projects up to \$400/business.

Additional information about the indoor water efficiency program is included in **Appendix C**. Once implemented, the indoor water efficiency programs are expected to save the Town 1.2 ac-ft/yr of water.



**BE RESOURCE WISE**

Resource Wise is a *free* program designed to help Summit County businesses decrease their environmental impacts. Services provided include:

- Energy and sustainability assessments
- Coaching
- Rebates for business improvements
- Local recognition
- **NEW FOR 2018: Installation of LED tubes, occupancy sensors, water-saving devices, and air sealing work**

To enroll, call the High Country Conservation Center at (970) 668 - 5703 and ask to speak with Jess.

Figure 13. Resource Wise Advertisement

### 8.2.2 Outdoor Water Efficiency

For at least the first two years of implementation, the Town anticipates working with Resource Central’s “Slow the Flow” program to conduct outdoor irrigation assessments. An irrigation assessment consists of a 90-minute consultation that includes:

- A customized watering schedule
- Efficiency tests that measure water usage and coverage
- A visual inspection to check for problem areas that waste water
- Minor adjustments to sprinkler heads

For year 1 of implementation, Resource Central is providing 120 free outdoor irrigation assessments for Summit County residents. The costs of these assessments are covered by a grant that Resource Central received from the Gates Family Foundation. In year 2 of implementation, the cost of the assessments will be cost-shared between the grant (50%) and the Town (50%).

In year 3 of implementation and beyond, the Town will evaluate whether to continue participation in the Slow the Flow program or to develop a new regional program based on estimated program costs and staff resources. To achieve the estimated water savings of 10 ac-ft/yr, the outdoor water efficiency program will need to be expanded to offer audits to more customers or to include additional services such as irrigation optimization and/or a landscaper certification program.

Additional information about the outdoor water efficiency program is included in **Appendix C**.

### 8.3 ORDINANCES AND REGULATIONS

In 2017, as part of the planning process, the Town began participating in a regional land use planning group convened with the intent of reviewing design guidelines and landscaping codes for existing incentives and barriers to water savings. Working group members include representatives from Summit County, municipalities, and the Northwest Colorado Council of Governments (NWCCOG). As such, the code reviews are intended to be conducted at multiple (county, local, regional) levels of government.

The working group will benefit from collaboration with NWCCOG, which was awarded a State Water Plan grant from the CWCB to develop model codes that incentivize water quality and water conservation objectives as well as funding to help five communities in the NWCCOG regional jurisdiction to amend their existing codes.

As the working group is only now being convened, the opportunities for water savings have not yet been identified or quantified. Additional information is included in **Appendix C**.

### 8.4 EDUCATIONAL ACTIVITIES

Educational efforts are being led regionally by High Country Conservation Center. The top priorities for this group in 2018 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.

Additional information is included in **Appendix C**. Water savings from the planned educational programs have not been quantified and are not relied upon to meet the Town's water conservation goals.

## 9 IMPLEMENTATION AND MONITORING PLANS

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### 9.1 IMPLEMENTATION

The Town'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.
  - The Town is responsible for the implementation of the foundational activities (billing upgrades, AMI and enhanced water loss control, and conservation-oriented rates) and participation in Resource Central's Slow the Flow program.
  - Land use planners at the local, County, and regional scale are responsible for initiating changes to ordinances and regulations.
  - High Country Conservation Center is responsible for leading institutional collaboration, the indoor water efficiency program, and education and outreach efforts.
- Work with other organizations and partners to develop implementation action plans, define funding needs, and exchange information about best practices and lessons learned. The Town 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 Town'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.

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

- Education and outreach
- Technical water efficiency programs (indoor and outdoor)
- Integrated water and land use planning

**Appendix C** includes implementation action plans that were developed for each working group to help transition from planning to implementation. The action plans will evolve as the working groups meet and take action.

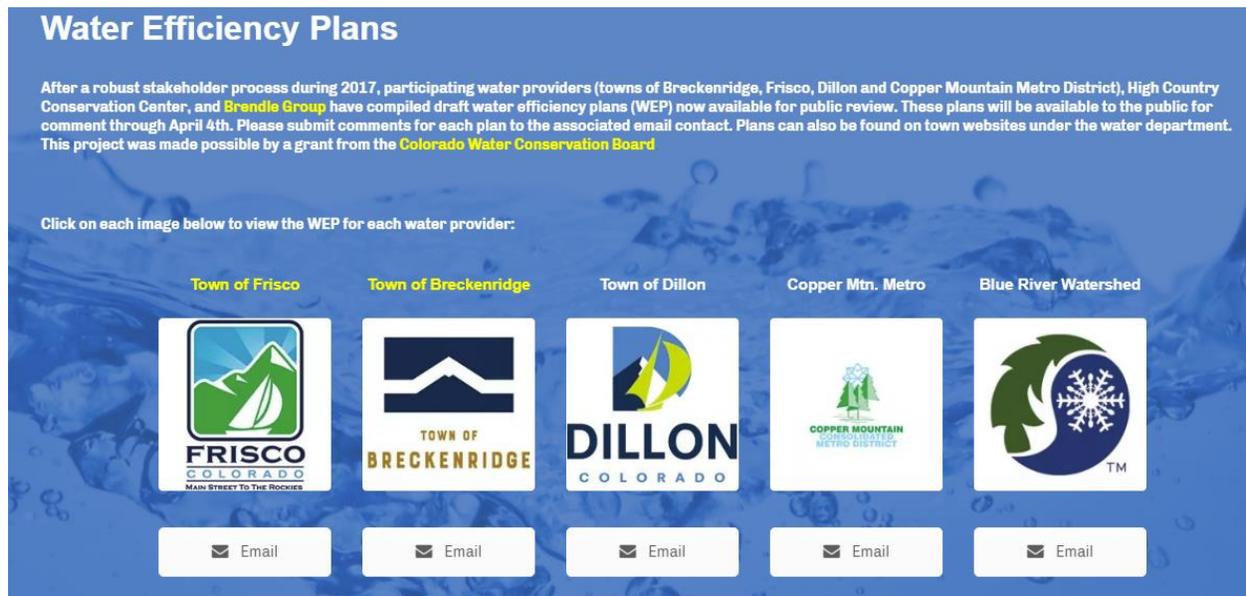
### 9.2 PLAN REVIEW, MONITORING, AND UPDATES

The Water Conservation Act of 2004 (HB04-1365) requires that water efficiency plans be made publicly available for review and comment for a period of 60 days, and that the plan be locally adopted by the appropriate governing entity. The Town complied with these requirements by posting the water efficiency plan on-line (**Figure 14, Figure 15**) and providing public notice of the plans through the Town's Facebook page, Twitter feed, and High Country Conservation's newsletter (**Figure 16, Figure 17**). The public comment period lasted from February 2, 2018 through April 4, 2018.

[Breckenridge Water Efficiency Plan 2018](#) 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 Town of Breckenridge has remained below that threshold in recent years, the Town, 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 Town’s history of water saving activities and future plans. The Town also seeks to leverage regional partnerships to effect change and encourage all residents and visitors to reduce water use.

The Water Division works to provide quality water that meets or exceeds the drinking water standards in sufficient quantities for domestic, commercial, irrigation and fire protection uses.

Figure 14. Screen Capture from the Town's Website (TOB, 2018b)



**Water Efficiency Plans**

After a robust stakeholder process during 2017, participating water providers (towns of Breckenridge, Frisco, Dillon and Copper Mountain Metro District), High Country Conservation Center, and **Brendle Group** have compiled draft water efficiency plans (WEP) now available for public review. These plans will be available to the public for comment through April 4th. Please submit comments for each plan to the associated email contact. Plans can also be found on town websites under the water department. This project was made possible by a grant from the **Colorado Water Conservation Board**

Click on each image below to view the WEP for each water provider:

Town of Frisco	Town of Breckenridge	Town of Dillon	Copper Mtn. Metro	Blue River Watershed
				
<a href="#">Email</a>	<a href="#">Email</a>	<a href="#">Email</a>	<a href="#">Email</a>	<a href="#">Email</a>

Figure 15. Screen Capture from the High Country Conservation Website (HC3, 2018)

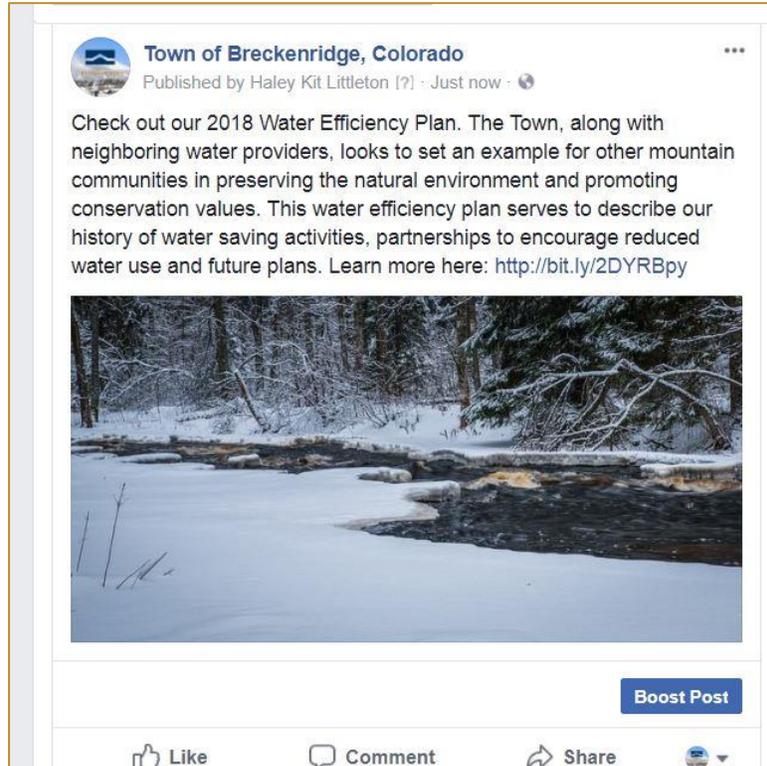


Figure 16. Screen Capture from the Town's Facebook Page (TOB, 2018c)



Figure 17. Screen Capture from the Town's Twitter Feed (TOB, 2018d)

Concurrently with the public review and comment period, the water efficiency plan was submitted to the Colorado Water Conservation Board for review. Review comments and responses to comments are included in **Appendix D**.

After the plan has been adopted by the Town Council, **Appendix E** will contain a copy of the resolution.

The Town intends to monitor the success of the water efficiency programs using the metrics presented in **Section 6.1 (Historical Water Demands)**. The Town will use **Appendix A** to track the metrics annually. If the Town 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.

The Town will update this plan every seven years, as required by The Water Conservation Act of 2004. Plan updates will incorporate the new data accumulated from the annual monitoring process and may include revisions to the Town's water efficiency goals and planned activities, as appropriate.

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## APPENDIX A: PLAN DATA

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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	<a href="#">Website</a>
American Water Works Association Rocky Mountain Section	Topics: water conservation, tap fees	Training	<a href="#">Website</a>
Colorado Water Conservation Board	Water Conservation Implementation Grants	Grant Funding Source	<a href="#">Website</a>
Colorado Water Conservation Board	Water Resource Conservation Public Education and Outreach Grants	Grant Funding Source	<a href="#">Website</a>
Colorado Water Conservation Board	Water Plan Grants	Grant Funding Source	<a href="#">Website</a>
Colorado WaterWise	Live Like You Love It	Education and outreach materials	<a href="#">Website</a>
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	<a href="#">Website</a> Contact Jeff Oxenford (720-353-4242)
Sonoran Institute	Land Use and Water Planning Workshop	Education and Training	<a href="#">Website</a>
WaterNow	Project Accelerator Program	Technical and program assistance	<a href="#">Website</a>

## APPENDIX C: IMPLEMENTATION ACTION PLANS

### EDUCATION AND OUTREACH WORKING GROUP

Last Updated: May 25, 2018

Working Group Role	Name and Organization
<b>Group coordinators</b> <i>(responsible for scheduling meetings and communications)</i>	Jessie Burley, High Country Conservation Center Hallie Jaeger, High Country Conservation Center
<b>Team members</b> <i>(responsible for helping with action items)</i>	Robert Buras, Town of Dillon Jed Callen, Resident Greg Hardy, Trout Unlimited Katlin Miller, Middle Park Conservation District Barry Rubenstein, High Country Conservation Center Dan Schroder, CSU Extension Julia Stennes, Town of Silverthorne

#### GOALS

- Initiate a coordinated education and outreach program for water conservation, including promoting all implementation activities

#### 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
  - HC3 Resource Wise sustainable business 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 a list of HOAs and contact information
- Prioritize 10 HOAs where working group members have personal connections

**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**

- For example: EPA’s Fix-a-leak week

**SUMMARY OF ACTION ITEMS**

Action Item	Responsible Team Member	Status
Compile contact list for HOAs	Dan	Complete
Prioritize 10 HOAs	All	In progress
Promote EPA’s Fix-a-Leak Week	Hallie/HC3	Complete
Promote HC3’s Resource Wise Sustainable Business Program	All	In progress
Promote participation in Resource Central’s Slow the Flow program for outdoor audits for customers served by participating providers	HC3 and participating towns	In progress
Promote participation in Resource Central’s Slow the Flow program for outdoor audits for customers NOT served by participating providers	Katlin/Dan	In progress
Work on marketing piece on water efficiency and leaks to supply during residential energy audits	All	In progress
Find a list of contractors/plumbers as a resource guide	Jed	In progress
Promote Blue River Explorer Hike	Greg	In progress

## TECHNICAL WATER EFFICIENCY PROGRAMS WORKING GROUP

**Last Updated: May 25, 2018**

Working Group Role	Name and Organization
<b>Group coordinator</b> <i>(responsible for scheduling meetings and communications)</i>	Laura Lynch, Town of Breckenridge
<b>Team members</b> <i>(responsible for helping with action items)</i>	Robert Buras, Town of Dillon Jeff Goble, Town of Frisco Jess Hoover, HC3 Hallie Jaeger, HC3 Cody Jensen, HC3 Zach Margolis, Town of Silverthorne Mike Nathan, A-Basin Ed Pankevicius, Copper Mountain Metro Karn Stiegelmeier, Board of County Commissioners Lane Wyatt, NWCCOG

### GOALS

- Pilot a residential indoor audit program
- Expand the HC3 Resource Wise sustainable business program to include more emphasis on water efficiency, including allowing water projects to qualify for rebates
- Promote Xcel Energy’s multi-family buildings program
- Reduce outdoor water use while maintaining aesthetics for visitor and resident appeal
- Focus on low-cost/no-cost water savings opportunities and customer education and outreach
- Design, pilot, and implement regional programs aimed at outdoor water efficiency, including outdoor water audits, irrigation system optimization, and landscaper certification

### STRATEGIES TO ACHIEVE GOALS

**Goal: 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 efficiency program design.
  - 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 residential information and audit 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.
  - Evaluate rebate structures/incentives. Find biggest water savings potential for each potential rebate measure.
  - Evaluate types of direct installs needed. At a minimum, include direct installs of showerheads and faucet aerators.
  - Compile effective educational materials.
- Design a 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: Develop a commercial outreach channel**

- 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.
  - Expand the program in offering and implementing recommendations for improving water efficiency based on the results from the sustainability 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 water-saving upgrades and projects
    - Direct installs of toilet bricks and pre-spray rinse valves

**Goal: Focus on low-cost/no-cost water savings opportunities and customer education and outreach**

- Identify largest users (for example, HOAs) and 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

**Goal: Design, pilot, and implement regional programs aimed at outdoor water efficiency, including outdoor water audits, irrigation system optimization, and landscaper certification**

- Years 1-2 of implementation: Take advantage of grant funding available from Resource Central to make Slow the Flow outdoor irrigation assessments available to 120 customers
- Years 3 and beyond: Determine continued participation in the Slow the Flow program versus developing a separate regional program. Expand services beyond audits to system optimization and landscaper certification.
  - 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

**Goal: Reduce outdoor water use while maintaining aesthetics for visitor and resident appeal**

- Coordinate efforts with the land use planning working group to evaluate municipal code for updates regarding vegetation requirements

## SUMMARY OF ACTION ITEMS

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

## INTEGRATED WATER AND LAND USE PLANNING

**Last Updated: May 17, 2018**

Working Group Role	Name and Organization
<b>Group coordinator</b> <i>(responsible for scheduling meetings and communications)</i>	Joyce Allgaier, Town of Frisco
<b>Invited team members</b>	Joyce Allgaier, Town of Frisco Graeme Bilenduke, Copper Mountain ski resort Robert Buras, Town of Dillon Jed Callen, Resident Allison Fulton, Copper Mountain Metro Jeff Goble, Town of Frisco Peter Grosshuesch, Town of Breckenridge Torie Jarvis, NWCCOG Katie Kent, Town of Frisco Susan Lee, Town of Frisco Zach Margolis, Town of Silverthorne Mike Nathan, A-Basin Pete Oltman, North Line GIS Ed Pankevicius, Copper Mountain Metro Don Reimer, Summit County Elena Scott, Norris Design Ned West, Town of Dillon Lane Wyatt, NWCCOG

### GOALS

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

### STRATEGIES TO ACHIEVE GOALS

#### Strategy 1: Code Amendments

- Engage and/or stay informed about NWCCOG efforts under their Colorado State Water Plan grant.
- 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, to be presented at June 14 RMSAWWA conservation committee meeting
  - 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

- Evaluate learning opportunity through Sonoran Institute.

- 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 ACTION ITEMS**

Action Item	Responsible Team Member	Date	Status
Evaluate learning opportunity through Sonoran Institute.	All	June 1, 2018	In progress
Convene planners to initiate code audits	Joyce	Summer 2018	Not started
Schedule an educational session on tap fees	Mark	June 14, 2018	Complete (Scheduled through AWWA RMS conservation committee)

## APPENDIX D: PLAN REVIEWS AND COMMENTS

### COLORADO WATER CONSERVATION BOARD

Conservation Plan Submittal Required Plan Elements Checklist

Name of Entity: Breckenridge WEP (Blue River Regional WEP)

Date Submitted: 3/23/18

Required Conservation Plan Elements	Completed?	Response to Comments
1. Name and contact information	Yes___ No_x_ Comment: Put final cover letter	Cover letter added
2. Organizations and individuals assisting with plan development	Yes_x_ No___ Comment: pg. 4	No action required
3. Quantified annual retail water delivery?	Yes__ No ___ Comment: treated water demand: 3506 af/yr demand at buildout with 250 af/yr raw water for snowmaking and golf course irrigation. <b>I would like to see a table with distributed and metered consumption for the years listed in Figure 6 or at least the last 5 years</b>	Added a new table (table 3) to section 6.1.1 showing available data. Also included reference to Appendix A: Plan Data.
4. Identified population served by retail water delivery?	Yes_x_ No___ Comment: Population 2010- 4680 permanent population; 14,040 day visitors; 23,400 transient (overnight) Total 2010 annual service population 42,547	No action required
5. Public comment period completed? (60 days or local regulation)	Yes___ No_x_ Comment: after review	Section 9.2 (Plan Review, Monitoring, and Updates) and Appendix D (Plan Reviews and Comments) were updated after public comment period was completed
6. Signature with authority to commit resources of the submitting entity?	Yes___ No_x Comment: Put in final cover letter	Cover letter added
7. All required water saving measures and programs considered?	Yes_x_ No___ Comment:	No action required

Required Conservation Plan Elements		Completed?	Response to Comments
I.	Fixtures and appliances – toilets, urinals, showerheads, faucets, etc.?	Yes_x__ No ___ Comment: Breck will participate in the HCC led indoor residential audits with install of fixtures	No action required
II.	Waterwise landscapes, drought resistant vegetation, removal of phreatophytes, efficient irrigation, etc.?	Yes_x__ No_____ Comment: Outdoor water audit program to evaluate system efficiencies and implement fixes through rebates; replaced athletic fields with artificial turf at recreation center	No action required
III.	Water efficient industrial and commercial processes?	Yes_x__ No_____ Comment: SustainableBreck initiative: voluntary green business program; Commercial outreach through HCC sustainable business program and will put financial resources towards upgrades	No action required
IV.	Water reuse systems?	Yes____ No_____ Comment: N/A	No action required
V.	Distribution system leak ID and repair?	Yes_x__ No_____ Comment: Upgrading AMR to AMI leading to improved leak detection and engagement; annual system-wide leak detection audits; water main replacement and rehab through lining	No action required

Required Conservation Plan Elements	Completed?	Response to Comments
VI. Information, public education, audits, demos?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <ul style="list-style-type: none"> <li>• Comment: Water efficiency information on website; Leak detection outreach and tours for public; High bill response; WaterSmart report card will engage customers on usage, compare to other similar customers and offer suggestions for improving efficiency; Top priorities for 2018 through HCC:</li> <li>• Developing or assembling water conservation materials that are targeted to priority sectors in support of implementation efforts under this plan.</li> <li>• Developing strategies for engaging the visiting and second homeowner population in Summit County.</li> <li>• Promoting awareness around joint energy-water savings opportunities.</li> <li>• Identifying key events and outreach channels for education and awareness efforts.</li> </ul>	No action required
VII. Conservation oriented rate structure and billing system?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comment: Two tier inclining block rate structure. Under 10Kgals fixed base rate with all other water above 10kgals 5.51/kgal in-town. More out of town. Commercial based on tap size with varying amounts depending on tap size and 3.31/kgal about allowance. Rate study scheduled in 2019.	No action required
VIII. Regulatory measures designed to encourage water conservation?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comment: Ordinance for water restrictions and no irrigation between 9 am-5pm; waterwise landscape code	No action required
IX. Incentives, rebates to encourage conservation implementation?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comment: See below	No action required

Required Conservation Plan Elements	Completed?	Response to Comments
8. Role of water conservation plan in overall water supply planning?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comment: Section 3.3 Vision statement pg. 7; Section 5.6 discusses relationship between supply reliability and demand activities as well as vulnerabilities	No action required
9. Steps to implement, monitor, review, and revise conservation plan including time period not to exceed 7 years?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comment: pg. 29-30 Great idea for the working groups!	No action required
10. Estimates of water saved through previous conservation efforts AND water saved through plan implementation?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comment: 250 af feet/yr demand reduction by 2025; 10% reduction from 2016; a few activities are not quantified due to nature of programs and initiatives; <b>See Below for comments</b>	No action required
11. Best management practices for water demand management, water efficiency, and water conservation that may be implemented through land use planning efforts	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Comment: Part of regional land use planning group in 2017 to review design guidelines and landscaping codes for existing incentives and barriers to water savings; one of four working groups formed for the plan is an "Integrated water and land use planning" group	No action required

**Plan Review Findings**

**Approved**

**Conditional Approval**

**Disapproval with Modifications**

**Plan review comments:**

*This plan review was completed by Kevin Reidy of the Colorado Water Conservation Board. Questions about the review, comments provided, the plan review process and the statutory requirements can be directed to Kevin.*

**More detail on retail water delivery:** I would like to see demand broken down by year, distributed water, metered usage and customer class in a table. Its hard to tell how much water is being used by just the bar chart on pg. 18.

**Response to Comment:** Added a new table (table 3) to section 6.1.1 to show production, total sales, and sales by sector for the period of 2011-2016. Added a reference to Appendix A for additional data.

**Future demands and demand reductions:** It would be good to have the data in the line graph (figure 12) on pg. 25 laid out in a table over time. This helps assess how much demand reduction there will be in each scenario.

**Response to Comment:** Added a reference to Appendix A for the demand forecast data.

**Details on programs:** In the body of the plan, refer to the Appendix C where the working group plans are. I didn't see it until Section 9 and when I read through the plan the first time, I was wanting more details on each program but didn't find it until I got to the Appendix C with the working group plans. I really like the working group plans though. Not sure if you want to have a blanket statement at the beginning of Section 8 directing readers to Appendix C or in each activity where it is relevant.

**Response to Comment:** Added references to Appendix C in Section 8 when discussing regional efficiency programs.

**Indoor/Outdoor Water Efficiency:** Would like to see more detail on the rebates, incentives and fixtures that will be implemented in the Indoor and Outdoor water efficiency sections. I realize you are creating them still but anything more would be great.

**Response to Comment:** Edited section 8.2.1 to clarify that the residential indoor audit program will include direct installs of showerheads and faucet aerators. The initial program incarnation will not include rebates or incentives. Edited section 8.2.1 to clarify that the commercial audit program includes direct installs of toilet bricks and pre-rinse spray valves and rebates covering 50% of the cost of water-saving projects up to \$400/business.

Why isn't the indoor water efficiency programs quantified? That would seem to be the easiest to do so. If not sure of the total scope of this, put in a placeholder savings amount that would act as a baseline estimate. Estimates are OK to have in the plan.

**Response to Comment:** Agreed. Quantified the estimated water savings based on the direct installs and assumed program participation. Edited the executive summary and Table 5 to reflect updated water savings estimates.

## PUBLIC REVIEW COMMENTS

- From Breckenridge Town Council: Will water conservation efforts affect revenue needed for development of the new water treatment plant?
  - **Response to Comment:** Reduced water consumption has the potential to impact revenues if rates are not adjusted on a regular basis and if the Town does not evaluate forecasted revenues against budget needs through rate studies. To mitigate these factors:
    - The Town proposes to conduct a rate study in 2019 (addressed in Section 8.1.3),
    - The Town adjusts rates each year based on debt, operations, and capital obligations. Edited Section 5.4 to include this information.
 Additionally, the Town has successfully navigated declines in water use of more than 1% each year since 2002.
- From Breckenridge Town Council: This plan lacks water quality information.
  - **Response to Comment:** Edited Section 7 to state: "While explicit water quality goals have not been set in relation to these water conservation efforts, the Town aims to maintain or enhance existing water quality."

## APPENDIX E: RESOLUTION TO ADOPT PLAN

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