



July 9, 2019

Mr. Kevin Reidy
Office of Water Conservation & Drought Planning
Colorado Water Conservation Board
Department of Natural Resources
1313 Sherman Street, Room 721
Denver, CO 80212

Re: Town of Superior 2019 Water Conservation Plan

Dear Mr. Reidy,

Please accept the Town of Superior's 2019 Water Conservation Plan (Plan) for final approval. This Plan was developed using treatment and billing data, interviews with the Town's Public Works and Utilities Department staff, and the Water Programs Annual Reports distributed by Resource Central (formerly Center for ReSource Conservation), of which the Town is a participant. The compilation of a Plan that combines water demand and supply planning efforts allows the Town to approach future growth and development with a comprehensive, dynamic strategy for meeting its water needs.

The Town Board of Trustees officially adopted the Water Conservation Plan by resolution on July 8, 2019 after a 60-day public comment period. A copy of the public comment received, and the official resolution are included in Appendix B and Appendix C of the attached Plan, respectively.

Sincerely,

Jim Widner, P.E.
Utilities Superintendent, Town of Superior
124 E. Coal Creek Drive
Superior, CO 80027
(303) 381-2013

murraysmith



850 W South Boulder Rd, Suite 200
Louisville, CO 80027
720-536-0579



Water Conservation Plan

July 2019



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Town of Superior

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Town of Superior

124 E. Coal Creek Drive
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Section 1

Section 1

Profile of Existing Water Supply System

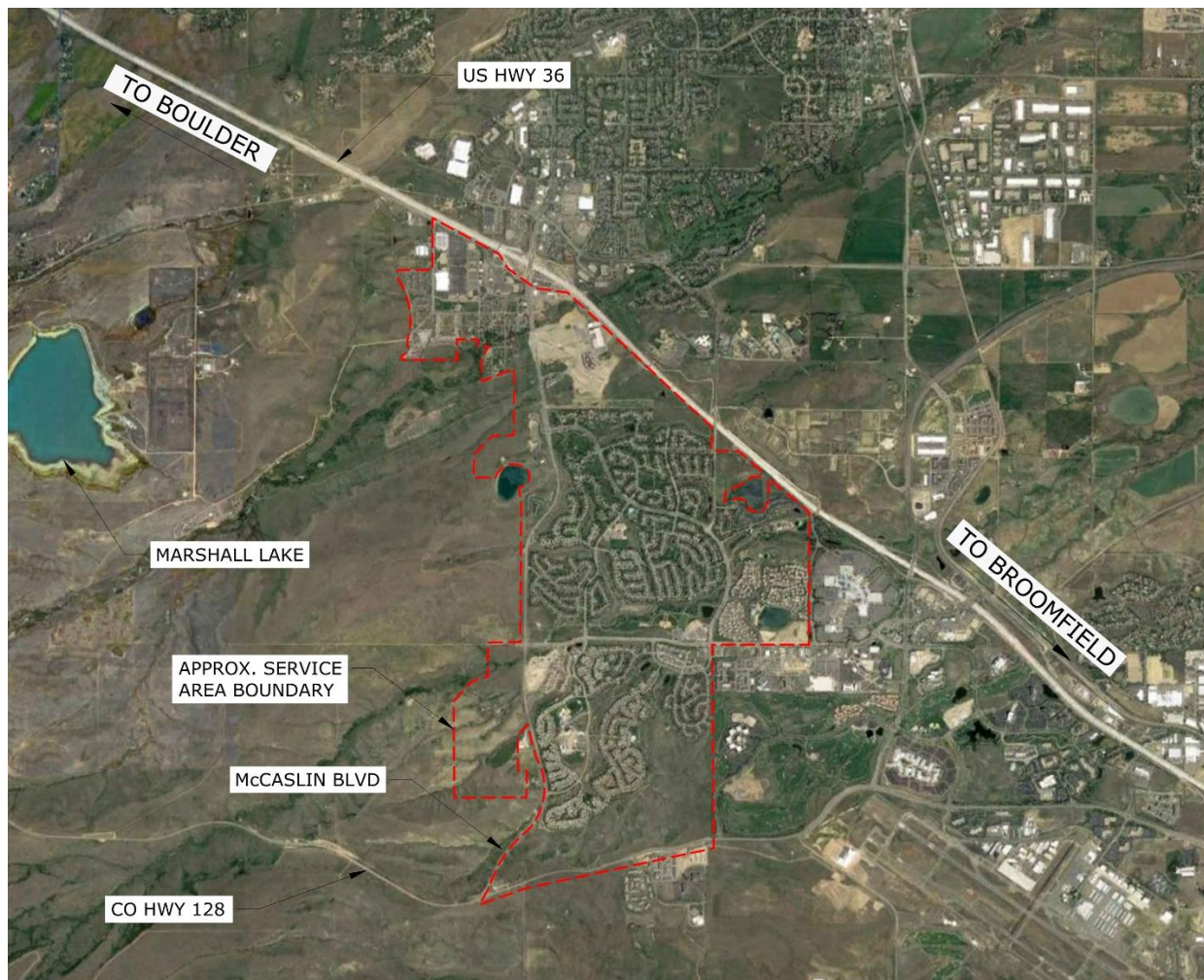
1.1 Overview

The Town of Superior (Town) has an intergovernmental agreement with Superior Metropolitan District No. 1 (SMD1) to finance and manage the water, wastewater, and stormwater systems for the Town. Since 2000, the members of the Town Board of Trustees have also served as members of the Board of Directors of SMD1, facilitating cooperation between the two entities. SMD1 owns and operates the treatment and conveyance facilities for the above listed utilities and is responsible for pursuing water rights sufficient for the future needs of Superior residents. For the purposes of this report, the Town and SMD1 will be treated as the same entity.

1.2 Location and Regional Characteristics

The Town of Superior (Town) is located mainly in southeastern Boulder County, Colorado approximately seven miles southeast of the City of Boulder along US Highway 36. The Town's service area extends from Highway 36 south to State Highway 128, and from Boulder County Open Space eastward to Broomfield city limits. The southernmost portion of the Town extends into Jefferson County, but the land is uninhabited. The Town limits are also the service area boundary, which encompasses 4 square miles. A vicinity map depicting the service area and key features is shown in **Figure 1-1**.

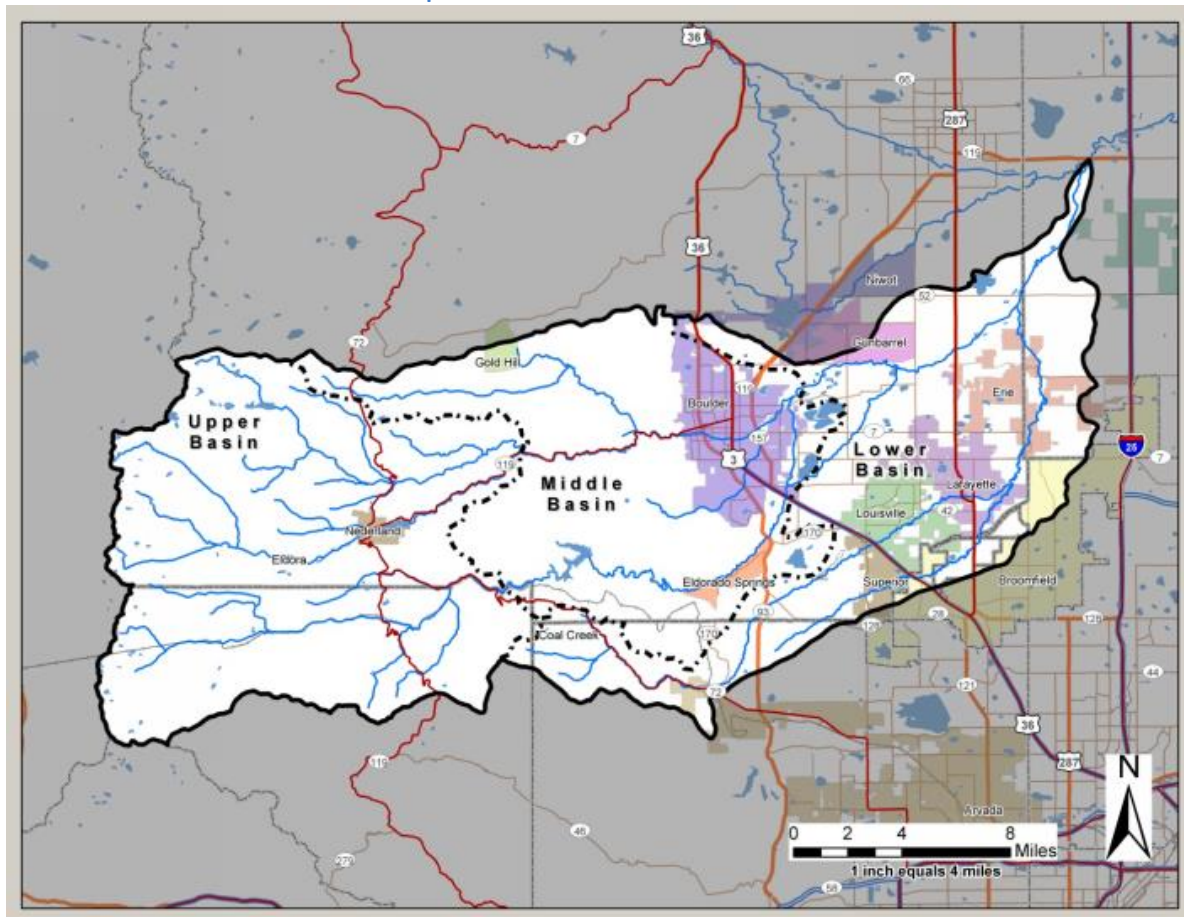
Figure 1-1
Service Area Map



1.2.1 Watershed Features

The overall St. Vrain Basin Watershed is located along the Front Range of the Colorado Rocky Mountains and can be divided into two subwatersheds – Boulder Creek and St. Vrain Creek – which follow a similar progression of characteristics from west to east, and ultimately flow into the South Platte River downstream of Platteville. Superior lies downstream of the City of Boulder in the Lower Basin of the Boulder Creek Watershed, as shown in **Figure 1-2**.

Figure 1-2
Boulder Creek Watershed Map



Source: Murphy et al. 2003

Multiple factors affect water quality in this subwatershed, including stormwater runoff from urbanized areas, water diversions, and discharges to Boulder Creek from local wastewater treatment plants or agricultural runoff. Of Boulder Creek's tributaries, Superior is closest to Coal Creek and Rock Creek, which flow through a mixture of agricultural land and urbanized areas before joining Boulder Creek downstream of Erie.

1.3 Water System Facilities

1.3.1 Distribution System

The SMD1 potable water distribution system was constructed in 1980, with expansions coinciding with periods of population growth. The distribution system can be divided into two pressure zones, and includes two booster pump stations, three treated water storage tanks, and approximately 65 miles of pressurized PVC water main that ranges in diameter from 6 to 20 inches. The low pressure zone has two treated water storage tanks, a 1.4 MG tank and a 1.5 MG tank. The high pressure zone is served by one 0.5 MG storage tank, for a total system storage volume of 3.4 MG.

1.3.2 Collection System

Superior's wastewater collection system was constructed in 1982, with several expansions occurring during the 1990's as the Town grew. The sewer lines are PVC and range in diameter from 6 to 24 inches. Wastewater from the northeastern corner of the service area is pumped to the WWTP through the Superior Town Center Lift Station. The rest of the collection system flows to the treatment plant via gravity.

1.3.3 Irrigation System

Non-potable water for irrigation is conveyed through its own segregated distribution system for use by non-residential customers. The non-potable water system includes: four pump stations – one at the treatment plant for reuse and three for non-potable distribution, one open storage pond, and a covered 1.4 MG irrigation reservoir.

1.3.4 Water and Wastewater Treatment

The Town's WTP was originally constructed in 1992 and expanded in 1999 to its current capacity of 5.5 MGD. The treatment facility uses a programmable logic controller (PLC) to initiate operation when a low-level switch is activated in the 1.4 MG storage tank and shut off plant operations if a high-level switch is activated in the distribution system storage tanks. Raw water is collected in a 400 acre-foot terminal reservoir adjacent to the treatment plant, located at 1300 South McCaslin Blvd. Pretreatment includes pH adjustment with soda ash and the addition of polymers in quick mixers before water is fed into clariflocculators. After flocs have settled, water flows through mixed media filters and is pumped to the 1.4 MG storage tank which provides adequate contact time for disinfection. Chlorine is injected after the filtrate pumps, along with fluoride and corrosion inhibitor. The WTP also includes an activated carbon mix tank that is currently not in use.

Superior's WWTP was constructed in 1989 and has undergone two expansions to reach its current capacity of 2.2 MGD. The WWTP headworks contains a mechanically raked bar screen, aerated grit chamber, and grit washing system. The treatment process is split into two trains, consisting of two aeration basins in series that gravity-flow to secondary clarifiers located in a separate building. Wastewater from the two treatment trains then recombines before flowing either to equalization ponds or being pumped and treated for filtration. After filtration, sodium hypochlorite is injected into the treated wastewater and the effluent is sent to a contact chamber prior to being used for irrigation or is dechlorinated and discharged to Rock Creek.

1.4 Water Supply and Reliability

1.4.1 Water Supply

The Town's predominant water supply is from ownership of Units in the Colorado-Big Thompson (C-BT) and Windy Gap Projects through allotment contracts with the Northern Colorado Water Conservancy District (Northern Water). C-BT Units are one-time use rights, meaning that the

effluent cannot be reused for irrigation and must be released into a waterway. Water rights for the Windy Gap Units can be reused for irrigation. Additional irrigation water is supplied by the Town's rights to water from three irrigation companies: the Farmers Reservoir and Irrigation Company (FRICO) Marshall Lake Diversion, South Boulder & Coal Creek Ditch Company, and Goodhue Ditch Company. Although the Town has the water rights to pump from groundwater wells in the Laramie-Fox Hills Aquifer, the wells are not operational.

Table 1-1 summarizes the Town's water supply sources and two annual yield values: Average Annual Yield and Firm Yield. Firm Yield is defined as the quantity of water projected to be available on a reliable basis under all conditions and should be used for planning purposes because it represents the Town's minimum entitlement for a given year. The figures for Windy Gap assume that the Windy Gap Firming Project will be built.

Table 1-1
Water Supply Source Summary

| Source | Average Annual Yield, AF (MG) | Dry Year Annual Yield, AF (MG) |
|---------------------------------|-------------------------------|--------------------------------|
| Transbasin Sources | | |
| Colorado-Big Thompson | 1,456 (474) | 1,040 (339) |
| Windy Gap | 1,283 (418) | 1,283 (418) |
| Irrigation Sources | | |
| Ditch Shares (Potable) | 67 (22) | 67 (22) |
| Ditch Shares (Non-Potable) | 77 (25) | 88 (28) |
| Reuse | | |
| Windy Gap | Up to 1,200 (391) | 770 (251) |
| Groundwater Wells | | |
| Laramie-Fox Hills Aquifer Wells | -- | -- |
| Total Raw Water Supply | 4,083 (1,330) | 3,248 (1,058) |

1.4.2 Reliability and Supply-Side Limitations

Upon completion of the Windy Gap Firming Project, the Town has a robust water supply portfolio. While the Town has not historically experienced water supply limitations, the Town's water supply could be compromised by drought or other unforeseen natural impacts (e.g., forest fire, climate change). In addition, the cost to the Town for treating and delivering reliable potable and non-potable water supplies is not insignificant and could result in financial constraints that would limit the supply side of the system.

1.5 Current and Proposed Water Supply Projects

There are no plans to acquire additional water rights. However, currently the Town is a participant in the Windy Gap Firming Project in the amount of 4,726 AF of storage. The original Windy Gap project was completed in 1985; a Unit was expected to produce a firm yield of 100 AF per year. Windy Gap water is an important component of the Town's supply since it can be used to extinction (i.e. reuse water) unlike other rights, which is an important component in water conservation. However, participants have not been able to rely on Windy Gap water in both dry and wet years. The Firming Project would provide storage of the Town's existing Windy Gap water rights and firm up the annual yield to provide 1,500 AF of water annually. The Windy Gap Firming Project is especially important during wet years when the Town can utilize storage, which is essential to provide water for existing uses and future demands. The Town has budgeted \$27,000,000 for the Windy Gap Firming Project completion.

The 400 acre-foot reservoir at the Town's WTP provides 23 days of storage at peak flows. Therefore, there are currently no plans to construct additional raw water storage. Additionally, according to the evaluation in Section 2 of this plan, there is no need to increase WTP capacity in the next 10 years.

The Town recently completed construction of a pipeline interconnect with the City of Louisville that is able to supply water in the event of a catastrophic failure at the Town's facility, providing critical redundancy in the Town's treated water supply system.

The potable water distribution system has further capital improvements planned. It was identified in the 2008 Utility Master Plan that the existing storage capacity in the distribution system is not adequate to meet peak day storage requirements. No additional pump stations are anticipated for the system. However, based on the 2008 Utility Master Plan evaluation it is likely that line sizes will need to be upsized in the potable water distribution system to meet future peak demand flows. This utility master plan is currently in the process of an update for 2019. Depending on the amount of conservation the timing of such improvements may be delayed due to conservation efforts.

The non-potable water distribution system also requires capital improvements. The existing 1.4 MG reservoir on the south side of Town does not have adequate capacity to meet high demands. When the tank level is low the reuse pumps operate continuously to keep up with demand, but their capacity is also not enough to match instantaneous demands. When this happens, raw water is supplied from Pond 5 to supplement the reuse water. To maximize reuse water, additional reuse water storage is needed; the total should be adequate to store one day of demand. Outdoor water conservation efforts would help maximize the use of reuse water immediately even without constructing additional water storage.



Section 2

Section 2

Water Demands and Historical Demand Management

2.1 Service Area Characteristics

2.1.1 Demographics and Historical Development

The Town's service area includes retail, small commercial, light industry, residential, and recreational uses. The majority of the Town's approximately 3,400 water utility accounts are single-family residences. Over the past 10 years, Superior has developed roughly 150 acres of land for commercial uses. Although the service area boundary will not change, a number of new developments are expected in the 10-year forecast horizon with similar land uses as currently exist in Superior.

2.1.2 Equivalent Residential Units

Superior has established an Equivalent Residential Unit (EQR) schedule that allows the demands of different types of customers to easily be compared. An EQR is the amount of demand that can be attributed to an average single-family detached residence or the equivalent. The EQR value assigned to each customer is applied to the base and usage fees for that account. EQR schedules for all users can be found in Section 6 of SMD1 Rules and Regulations.

2.1.3 Customer Categories and Billing Structure

Potable and non-potable water delivery is categorized into five main customer segments:

- Residential – potable water delivery to single family homes and duplexes, for indoor and outdoor use.
- Multi-family – potable water delivery to three or more attached living units for indoor use. Common areas have a separate irrigation tap supplied with non-potable water.
- Commercial – potable water delivery for indoor use to buildings not included above, including retail, schools, hotels, and offices. Commercial establishments have a separate non-potable irrigation tap.

- Commercial irrigation – non-potable water delivery to commercial establishments with dedicated irrigation taps.
- Municipal irrigation – non-potable water delivery for irrigation at Town facilities, including parks, rights-of-way, streetscapes, and medians.

Superior charges system development fees, fixed monthly base fees, and usage fees to cover capital and operating costs. Monthly potable water charges consist of a base fee and an inclining block rate structure. The base fee varies for commercial establishments depending on the tap size. Potable water bills are sent to customers monthly. Additionally, the Town leases non-potable water to the Boulder Valley School District for irrigation use at the Monarch K-8 school in the neighboring community of Louisville. The school district pays a base fee of \$188 per month.

Irrigation (non-potable) water charges consist of a base fee per meter and a flat usage charge per 1,000 gallons. The associated monthly base fee is only charged seasonally with water availability, typically 8 months out of the year. Non-potable water for irrigation is only provided to non-residential customers.

The current base fees and system development fees for potable and non-potable water, effective March 2019, are summarized in **Table 2-1**. Usage fees for all potable and non-potable customers are outlined in **Table 2-2**.

Table 2-1

Water System Base Fees and System Development Fee by Customer Class

| Customer Category | Base Fee (\$/month/EQR) | System Development Fee |
|---|----------------------------|---------------------------|
| Residential | \$17.94 | \$23,340 |
| Commercial, Multifamily, Industrial, Governmental, Other ¹ | | |
| 3/4" Service Line ² | \$17.94 | \$18,155 |
| 1" Service Line | \$33.94 | \$32,416 |
| 1-1/2" Service Line | \$67.84 | \$72,612 |
| 2" Service Line | \$135.20 | \$125,778 |
| 3" Service Line | \$292.69 | \$285,265 |
| 4" Service Line | \$499.20 | \$503,103 |
| Irrigation (Non-Potable) ³ | | |
| 3/4" Service Line | \$13.37 | \$9,857 |
| 1" Service Line | \$13.37 | \$17,742 |
| 1-1/2" Service Line | \$13.37 | \$39,427 |
| 2" Service Line | \$13.37 | \$65,713 |
| 3" Service Line | \$13.37 | \$157,713 |
| 4" Service Line | \$13.37 | \$262,852 |

¹System Development Fee is per EQR

²3/4" Service lines to properties without a separate irrigation tap (when permitted only) will be charged a \$23,340 per EQR System Development Fee.

³Monthly base fees for irrigation customers are charged seasonally, typically 8 mos./yr.

Table 2-2
Water System Monthly Usage Fees by Customer Class

| Customer Category | Usage Fee (\$/1,000 gal/EQR) | |
|---|------------------------------|-------------------------|
| Residential, Commercial, Multifamily, Industrial, Governmental, and Other | \$3.51 | 0-7,000 gallons |
| | \$3.84 | 7,001 - 20,000 gallons |
| | \$5.43 | 20,001 - 30,000 gallons |
| | \$7.14 | 30,001 - 40,000 gallons |
| | \$10.48 | 40,001+ gallons |
| Irrigation (Non-Potable) | \$2.80 | |
| Boulder Valley School District | \$3.04 | |

All water system customers not using the sewer collection system pay base and usage fees as determined above multiplied by a factor of 1.3.

2.1.4 Current and Proposed Development

Two residential developments have recently been completed, the Coal Creek Crossing and Calmante I neighborhoods, that added a combined 150 residences to the Town's service area. The Town is expecting several other developments will be completed within the planning horizon that will have similar land uses as currently exist in Superior. The largest development that is projected to be completed during the 10-year planning horizon is called Town Center and will provide an additional 1,400 residences, 300 hotel rooms and approximately 650,000 square feet of commercial space. Residential growth resulting from the Town's forthcoming developments is summarized in **Table 2-3** below. Although the Town may permit further development, **Table 2-3** includes all proposed developments that are known to the Town's Planning Department.

Table 2-3
Residential Development

| Development Name | Residential Units | Pop. Gain | Expected Completion |
|----------------------|-------------------|--------------|---------------------|
| Calmante II | 33 | 83 | 2020 |
| Aweida | 20 | 50 | 2020 |
| Anderson | 62 | 155 | 2020 |
| Resolute | 94 | 235 | 2022 |
| Rogers Farm | 70 | 175 | 2025 |
| Zaharias | 188 | 470 | 2025 |
| Superior Town Center | 1,400 | 3,500 | 2027 |
| Total | 1,867 | 4,668 | -- |

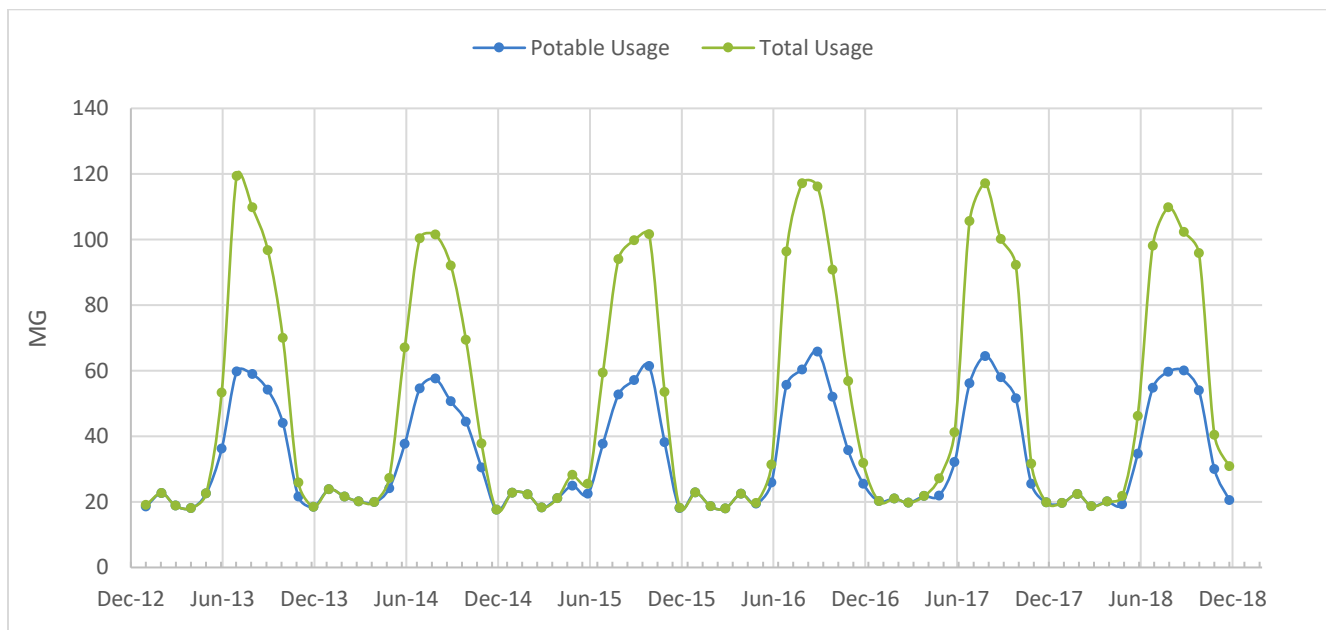
2.2 Historical Water Demands

Accounting for water use through data collection is a critical step in evaluating trends in water use and the effectiveness of conservation measures and programs. The Town provided WTP data, as well as potable and non-potable water use based on billed monthly data for 2013 through 2018. While this data is sufficient for developing a Water Conservation Plan, water accounting could be improved with additional equipment to measure usage associated with the hydrant flushing and other operational activities. In addition, some water use is measured (i.e. construction water) but is billed off-line, so is not accounted for in the billed monthly data.

Although the service area population has fluctuated between 2013 and 2018, total annual water demand has remained relatively constant over the past 6 years. This is typical of municipal demand trends across the United States, which have generally declined or held steady in recent years, even as population increases. This can be credited to Superior's current billing structure and water efficiency policies, along with national plumbing codes and standards and programs like Colorado WaterWise.

Figure 2-1 summarizes the Town's billing data from 2013 to 2018 and illustrates monthly trends in potable and total water usage. Average total demand for this period was approximately 600 MG per year. Across the year, potable use accounts for approximately two-thirds of demand, but closer to only half of demand during the peak summer months.

Figure 2-1
Water Use Trends, 2013-2018



The Town's largest potable and non-potable water users are commercial properties and public schools, respectively. More information on individual users and their yearly usage is included in Section 4 of this Plan.

2.2.1 Potable Water Demand

All of the service area's potable water is supplied by the SMD1 WTP, located at 1300 S McCaslin Boulevard. As shown in **Table 2-4**, total potable water demand for the Town of Superior remained relatively constant at approximately 400 MG over the last 6 years. The minor fluctuations in demand match historical population trends.

Table 2-4
Potable Water Demand Summary (MG)

| Year | Residential Demand | Commercial Demand | Total Potable Demand |
|----------------|--------------------|-------------------|----------------------|
| 2013 | 372.2 | 25.5 | 397.7 |
| 2014 | 373.9 | 28.3 | 402.1 |
| 2015 | 369.2 | 27.6 | 396.7 |
| 2016 | 394.3 | 27.4 | 421.7 |
| 2017 | 373.2 | 38.6 | 411.8 |
| 2018 | 385.9 | 27.3 | 413.2 |
| Average | 378.1 | 27.1 | 407.2 |

The Town's largest potable water customers are commercial retail properties and a homeowner's association.

2.2.2 Non-Potable Demand

Non-potable water comes from three sources: treated wastewater from the WWTP, raw water from the Town's reservoir and ditch shares from the irrigation companies. For purposes of this report, effluent from the WWTP that is treated for use as irrigation water is referred to as reuse water. The non-potable water system includes reuse water and raw water.

The total amount of land irrigated by the non-potable system is approximately 349 acres. The largest non-potable customers served by SMD1 are school districts and the Town of Superior. The Town uses reuse water from the WWTP for irrigation when possible, but storage capacity at the plant is limited and must be supplemented by other sources in order to meet demand during peak months. Reuse water is supplemented with raw water from the terminal reservoir and FRICO Ditch. **Table 2-5** summarizes annual irrigation demand from 2013 to 2018.

Table 2-5
Monthly Irrigation Demand (AF)

| Month | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | Average |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Jan | 1.5 | 0 | 0 | 0 | 0 | 0 | 0.2 |
| Feb | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mar | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Apr | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 0 | 9.7 | 10.2 | 0.8 | 16.1 | 7.7 | 7.4 |
| Jun | 52.9 | 90.5 | 9.4 | 17.0 | 28.0 | 35.4 | 38.9 |
| Jul | 184.1 | 141.3 | 66.7 | 125.7 | 152.7 | 133.7 | 134.0 |
| Aug | 156.8 | 135.6 | 127.5 | 175.4 | 162.5 | 154.7 | 152.1 |
| Sep | 131.4 | 127.8 | 131.6 | 155.3 | 130.1 | 130.2 | 134.4 |
| Oct | 80.1 | 76.9 | 124.3 | 119.6 | 125.4 | 129.3 | 109.3 |
| Nov | 13.2 | 22.8 | 47.5 | 65.1 | 19.0 | 32.2 | 33.3 |
| Dec | 0 | 0 | 0.3 | 19.4 | 0 | 32.1 | 8.6 |
| Total | 619.9 | 604.6 | 517.6 | 678.1 | 633.9 | 655.4 | 618.3 |

The average annual amount of non-potable water used from 2013 to 2018 was 618.3 AF, equivalent to approximately 200 MG per year. Peak month usage was 184.1 AF in July of 2013, an average of 5.9 AF per day for the month. A small amount of flow is recorded even during the winter months, but this is due to operational requirements at the WWTP to keep the tank filled and does not actually go into the non-potable system.

2.3 System Water Losses

In order to estimate water losses occurring between treatment and consumption, treated water data was taken from meters located throughout the WTP and compared to billing data. Water losses were then quantified as a percentage of total production. **Table 2-6** summarizes the system's water losses.

Table 2-6
Water Loss Summary

| Year | Total Production (MG) | Backwash | Billed Metered Usage | Water Loss (MG) | Water Loss (%) |
|------|-----------------------|----------|----------------------|-----------------|----------------|
| 2013 | 435.6 | 21.3 | 397.7 | 12.5 | 2.9% |
| 2014 | 446.2 | 10.0 | 402.1 | 30.0 | 6.7% |
| 2015 | 450.9 | 13.6 | 396.7 | 36.6 | 8.1% |
| 2016 | 472.2 | 15.5 | 421.7 | 30.7 | 6.5% |
| 2017 | 482.5 | 12.7 | 411.8 | 53.9 | 11.2% |
| 2018 | 453.0 | 7.0 | 413.2 | 28.7 | 6.3% |

Water losses over the last 6 years have shown loss values ranging from 2.9 percent to 11.2 percent, with an average of 7.0 percent. The Town's water mains are in good condition, as indicated by system water losses typically falling under the 10 percent threshold that is often estimated as the national average. However, the 11.2 percent losses shown in 2017 indicate that leakage and breaks are still an occasional problem for the Town and should be addressed through ongoing leak detection programs.

2.4 Demand Management Activities

The Town has several water conservation measures and programs already in place that will be evaluated as part of this plan, and potentially continued or expanded. A majority of land development in the Town occurred fairly recently compared to other communities, which provided the Town with a unique opportunity to better incorporate infrastructure that would support sustainable water use. The primary example is the separate non-potable water supply system for irrigation.

Other water conservation measures and programs currently in place include the following:

- **Mandatory Watering Restrictions** – In response to drought conditions in 2003 the District modified its rules and regulations to include mandatory time-of-day watering restrictions for potable water users. The restriction states there is no watering allowed from April 1st through October 31st from 10:00 am until 6:00 pm. These restrictions were instituted effective December 15th, 2003; although they were in response to the drought, they have not been repealed.
- **Slow the Flow Water Audits** – Slow the Flow is a program available through Resource Central (formerly the Center for ReSource Conservation) for participating water providers. Slow the Flow offers audits on landscape and irrigation use and residential water usage. Last year the Town offered 82 water audits to residential customers as part of Slow the Flow.
- **Meter Inspection and Replacement** – The Town has an ongoing operation and maintenance budget for inspection and replacement of old water meters.
- **Central Irrigation System** – the Town has used an automated irrigation control system for the non-potable irrigation system since 2009, with all electronic irrigation clock systems replaced in 2019. This system controls watering zones and times for all non-potable water.
- **Leak Detection** – Though the distribution infrastructure is relatively new there are some older areas, and the Town understands the importance of monitoring and assessing the condition of the system. Since the beginning of the leak detection program in 2009, approximately 80 percent of the potable water distribution system has been tested for leaks using acoustic technology as part of Phase I and Phase II testing. The Town is planning

to complete testing on the remainder of the potable water system as budgetary priorities warrant.

- **Fee Structure** – District potable water rates are charged according to an inclining block rate structure. This is a common approach to encourage water conservation by charging more per volume as water use increases. Non-potable water is charged at a flat rate per volume. There are no planned water rate increases in the near future. The Town performed a System Development Fee Study in 2009. As a result of this study adjustments were made to the development fees including increasing the residential fee, decreasing the fee for a $\frac{3}{4}$ " commercial tap, and increasing the fee for commercial taps greater than $\frac{3}{4}$ ". Significant changes were made to the irrigation water system fees which were increased by a factor of five for each tap size.
- **Residential Green Building Program** – The Superior Municipal Code outlines the requirements for building, electrical, plumbing, and many other disciplines. The Town Board adopted a Green Building Program in 2009 that requires new residential construction and renovation projects to meet minimum efficiency requirements. The new dwelling has to meet "green point" requirements based on the project type and square footage. Many of the points are energy related, such as evaporative cooling, solar power, and efficient windows. However, there are several points that would conserve water: point of use water heater, high efficiency fixtures, Xeriscape landscaping and high-efficiency automatic irrigation. The regulations do not require a certain amount of water efficient points to meet the code requirements.
- **Educational Outreach** – The Town currently disseminates water conservation tips and strategies through its Town newsletter to residents. In addition, as part of its compliance with Regulation 84 requirements, the Town meets with all non-potable water customers annually to discuss their irrigation practices and to reiterate the need for application at no more than agronomic rates.
- **Internet** – An Environmental page on the Town's website advertises water conservation programs, events and tips for residents to view. One such program is the water efficiency rebate program. This program offers rebates to homeowners for installing certain water-efficient products at their home.

2.5 Demand Forecast

2.5.1 Population Planning Projections

The Town's population in 2017 was estimated at 12,951 by the US Census Bureau (no data is currently available for 2018). Although the town experienced steady growth during a period of development in the 1980's, growth slowed in the early 2000s and has remained relatively steady since. Yearly populations for 2005 through 2017 were taken from US Census Bureau Data. As

shown in **Table 2-7**, the Town's average annual population growth over the past 15 years is approximately 1.96 percent. Due to the large fluctuations in growth that are becoming characteristic of many communities located on Colorado's Western Slopes, annual growth was tied directly to the Town's planned developments rather than historic growth. Annual growth was determined by distributing the total population gain related to developments (from **Table 2-3**) over the 10-year planning horizon. This results in a population gain of 467 people per year. Population for 2018 and 2019 was estimated using the average growth rate of 1.96 percent since no developments were or will be completed during that period.

Table 2-7
Population Growth and Projections

| Year | Population | Percent Growth | Year | Projected Population | Percent Growth |
|-----------------------|------------|----------------|-------------|----------------------|----------------|
| 2005 | 10,386 | -- | 2018 | 13,205 | 1.96% |
| 2006 | 10,409 | 0.22% | 2019 | 13,464 | 1.96% |
| 2007 | 10,475 | 0.63% | 2020 | 13,931 | 3.47% |
| 2008 | 10,543 | 0.65% | 2021 | 14,398 | 3.35% |
| 2009 | 10,603 | 0.57% | 2022 | 14,865 | 3.24% |
| 2010 | 12,490 | 17.80% | 2023 | 15,332 | 3.14% |
| 2011 | 12,597 | 0.86% | 2024 | 15,799 | 3.05% |
| 2012 | 12,721 | 0.98% | 2025 | 16,266 | 2.96% |
| 2013 | 12,779 | 0.46% | 2026 | 16,733 | 2.87% |
| 2014 | 12,755 | -0.19% | 2027 | 17,200 | 2.79% |
| 2015 | 12,879 | 0.97% | 2028 | 17,667 | 2.72% |
| 2016 | 13,059 | 1.40% | 2029 | 18,134 | 2.64% |
| 2017 | 12,951 | -0.83% | 2030 | 18,601 | 2.58% |
| Average Growth | | 1.96% | Beyond 2030 | 19,068 | 2.51% |

2.5.2 Demand Forecasts

2.5.2.1 Residential Use

Residential water use forecasts were developed based on a combination of single family and multi-family billing data, and future population data. Single family and multi-family customer segments account for all residential water use within the Town and exclude transient populations that use Town supplied water such as tourists and the daily influx of water uses in commercial businesses. The methodology used to estimate single- and multi-family future water demands is as follows:

- Annual residential water use was calculated for 2013 through 2018 for the combined single- and multi-family customer accounts as shown in **Table 2-8**. The average individual usage for these six years was used as the base for future residential per capita usage estimates.
- Future projections were calculated as the product of the predicted future population and the residential per capita usage.

Table 2-8
Residential Per Capita Use

| Year | Population | Annual Residential Use (MG) | Residential Per Capita Use (gpcd) |
|----------------|------------|-----------------------------|-----------------------------------|
| 2013 | 12,779 | 372 | 79.8 |
| 2014 | 12,755 | 374 | 80.3 |
| 2015 | 12,879 | 369 | 78.5 |
| 2016 | 13,059 | 394 | 82.7 |
| 2017 | 12,951 | 373 | 78.9 |
| 2018 | 13,018 | 386 | 81.2 |
| Average | | 378 | 80.3 |

2.5.2.2 Commercial Use

Future commercial water use was estimated based on observed monthly commercial water use and connection data. The methodology used to estimate future commercial water use is outlined below.

- The average daily commercial water use per connection was calculated for each year from 2013 through 2018. The results of this analysis by year are presented in **Table 2-9**.
- Using the commercial connections data, a projected annual connection growth rate of 0.33 percent per year was estimated using linear interpolation from 2013 through 2018.
- Forecasting commercial water use was performed using the product of the average yearly commercial water use per connection and the estimated number of commercial connections through the year 2030.

Table 2-9
Commercial Per Tap Use

| Year | No. of Commercial Taps | Annual Commercial Usage (MG) | Daily Usage Per Tap (gal) |
|----------------|------------------------|------------------------------|---------------------------|
| 2013 | 304 | 26 | 230.2 |
| 2014 | 304 | 28 | 254.7 |
| 2015 | 306 | 28 | 246.9 |
| 2016 | 308 | 27 | 243.7 |
| 2017 | 310 | 39 | 341.4 |
| 2018 | 309 | 27 | 242.2 |
| Average | | 29 | 259.9 |

2.5.2.3 Irrigation (Non-Potable)

Irrigation use was estimated based on observed monthly irrigation water use and connection data. The methodology used to estimate future irrigation water use is provided in the following steps.

- The average daily irrigation water use per connection was calculated for each year from 2013 through 2018, as shown in **Table 2-10**.
- Based on the data from 2013 to 2015, a projected annual irrigation growth rate was estimated at 2 percent.
- Buildout for irrigation connections is predicted to occur in 2021 at a total of 90 taps.

Table 2-10
Irrigation Per Tap Use

| Year | No. of Irrigation Taps | Annual Non-Potable Usage (MG) | Daily Usage Per Connection (gal) |
|----------------|------------------------|-------------------------------|----------------------------------|
| 2013 | 76 | 200.8 | 7239.7 |
| 2014 | 76 | 195.9 | 7060.8 |
| 2015 | 78 | 167.7 | 5889.8 |
| 2016 | 80 | 219.7 | 7523.5 |
| 2017 | 83 | 205.4 | 6778.7 |
| 2018 | 85 | 212.3 | 6843.2 |
| Average | | 200 | 6889.3 |

Assuming irrigation behaviors and patterns remain relatively constant, non-potable usage for the planning period can be assumed to be approximately 6,889 gallons per connection per year.

2.5.2.4 Summary

Using the forecasts described above for each category of water, total annual potable and non-potable water demand were forecasted for the planning period, as summarized in **Table 2-11** below. These forecasts include passive conservation related to the routine replacement of fixtures and appliances as they age over time but does not include savings related to water efficiency activities. For example, upgrades for sole purpose of improved efficiency are not included in passive conservation.

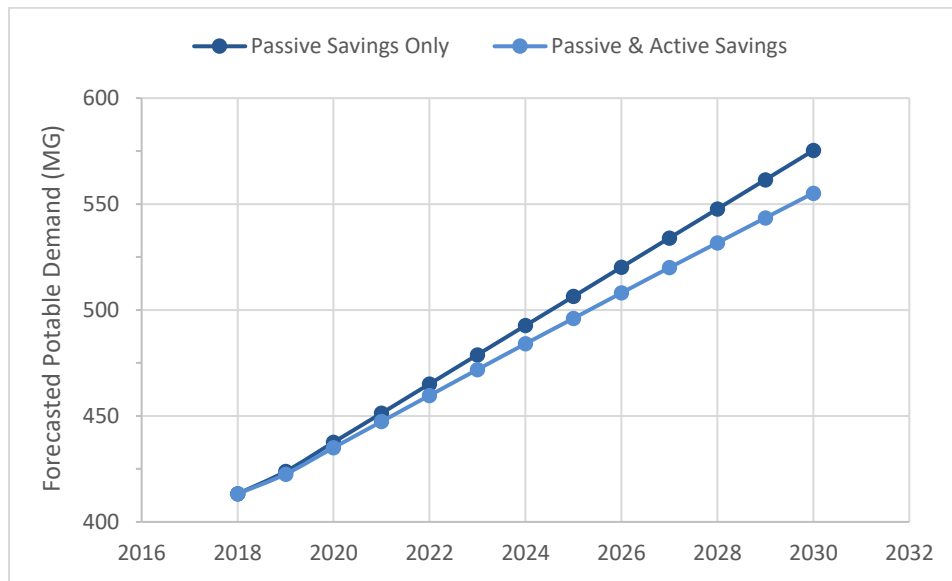
Table 2-11
Total Water Demand Forecast

| Year | Projected Population | Residential (MG) | Commercial (MG) | Total Potable Demand (MG) | Irrigation (Non-Potable) (MG) | Total Annual Demand (MG) |
|------|----------------------|------------------|-----------------|---------------------------|-------------------------------|--------------------------|
| 2019 | 13,464 | 394.4 | 29.4 | 423.8 | 218.8 | 642.6 |
| 2020 | 13,931 | 408.1 | 29.5 | 437.6 | 223.8 | 661.4 |
| 2021 | 14,398 | 421.7 | 29.6 | 451.3 | 226.3 | 677.6 |
| 2022 | 14,865 | 435.4 | 29.7 | 465.1 | 226.3 | 691.4 |
| 2023 | 15,332 | 449.1 | 29.8 | 478.9 | 226.3 | 705.2 |
| 2024 | 15,799 | 462.8 | 29.9 | 492.7 | 226.3 | 719.0 |
| 2025 | 16,266 | 476.5 | 30.0 | 506.4 | 226.3 | 732.7 |
| 2026 | 16,733 | 490.1 | 30.1 | 520.2 | 226.3 | 746.5 |
| 2027 | 17,200 | 503.8 | 30.2 | 534.0 | 226.3 | 760.3 |
| 2028 | 17,667 | 517.5 | 30.3 | 547.7 | 226.3 | 774.1 |
| 2029 | 18,134 | 531.2 | 30.4 | 561.5 | 226.3 | 787.8 |
| 2030 | 18,601 | 544.9 | 30.4 | 575.3 | 226.3 | 801.6 |

The estimated future demand of potable and non-potable water does not exceed the peak day water treatment capacity or the average water rights yield of the Town's C-BT, Windy Gap, and ditch portfolios. As shown, the total annual demand at the end of the 10-year planning period is 802 MG, or approximately 2,461 AF, which can be fully met by the Town's existing water rights. Note that non-potable demand is not expected to increase after buildout occurs in 2021.

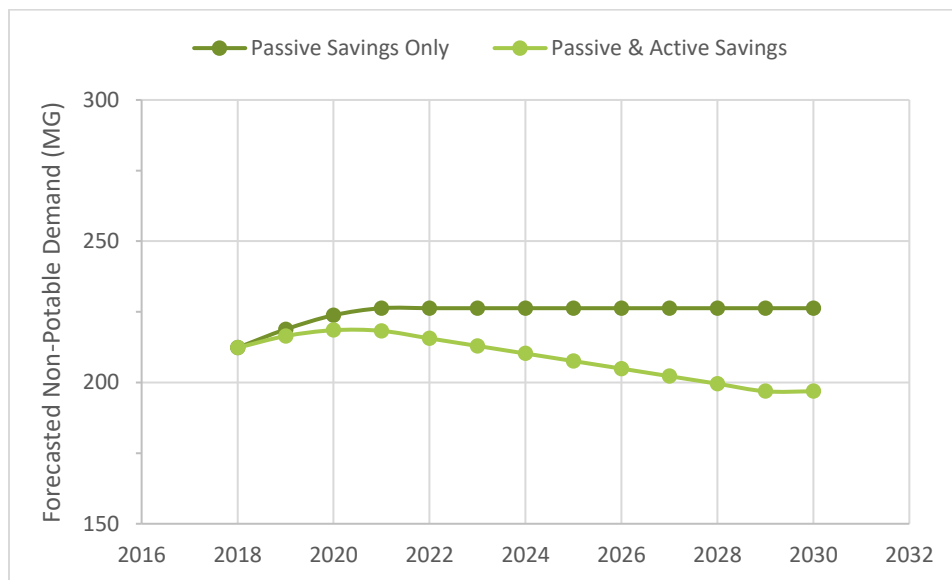
Figure 2-2 and **Figure 2-3** compare demand forecasts under two scenarios, future demand with only passive conservation and future demand with active conservation. Active conservation includes water savings as a result of the selected water efficiency activities.

Figure 2-2
Modified Potable Demand Forecast



As mentioned in **Section 3**, the Town has set a potable demand savings goal of 3.5% over the next ten years.

Figure 2-3
Modified Non-Potable Demand Forecast



As discussed in **Section 3**, the Town has set a non-potable demand savings goal of 13% over the next ten years.

Section **3**

Section 3

Integrated Planning and Water Efficiency Benefits and Goals

3.1 Water Efficiency and Water Supply Planning

Defining the desired results of a successful Water Conservation Plan is an important part of water system planning because it provides a meaningful measure of the implementation of water efficiency activities and can assist in predicting and meeting future water supply needs. Key areas of water efficiency and supply planning are the Town's operation of municipal infrastructure and facilities, including reducing non-revenue water and improving water use efficiency within its buildings and parks.

3.2 Water Efficiency Benefits and Goals

Water conservation goals for individual entities are always unique, even differing from that of neighboring communities depending on development patterns, available water rights, and public interest. The Town of Superior has unique water conservation needs and the goals are catered as such.

Given that a majority of single family homes have been recently constructed these homes already include more water efficient fixtures compared to older houses. Based on this fact it is anticipated that residential per capita water use is not expected to change substantially due to indoor water use reductions, beyond those that will naturally occur as a result of passive savings. There may be modest savings expected in this segment from more efficient irrigation practices in single family homes. In terms of indoor water use there may be more opportunity to conserve water with commercial and office establishments, as well as within Town-owned and managed facilities. Therefore, goals for future water demand reductions are focused upon the Town's ability to limit the following water uses and related inefficiencies:

- Non-revenue water losses
- Outdoor irrigation practices
- Large water users of both potable and non-potable supplies

The Town is looking to reduce the total annual potable water demand by about 3.5 percent over the next 10 years, which translates to about 43 AF, or 14 million gallons a year, including improvements in non-revenue water loss reduction. This goal reflects the fact that the Town

currently provides water service via new infrastructure built since 1994 (with respect to both residential and commercial customers). If the Town had a large component of older infrastructure built before the National Energy Policy Act of 1992 was implemented, it may have higher targets for water savings, but the vast majority of the Town was constructed after the Act took effect in 1994.

Non-potable water, which includes all commercial, multifamily and irrigation systems, is a segment of water use more suited for targeted water conservation measures. Control of the system was recently switched to a programmable controller, but the system has not been optimized and there is potential for savings. A more aggressive water savings goal of approximately 13 percent in the next 10 years is desired by the Town for the non-potable system (which translates to a water demand reduction in 2030 of about 80 AF, or about 26 million gallons per year).

If the Town is successful in meeting these goals it may allow the Town to delay projects such as the upsizing of distribution system piping and upgrades to the non-potable system storage capacity.

3.3 Integrated Land Use and Water Efficiency Planning

The Town's Building and Public Works Departments worked collaboratively to develop the Green Building Program in order to incorporate water conservation into new development approvals. This program allows the Town to integrate water utility and land use planning in order to establish efficient water usage in new developments. The Public Works and Building Departments hold weekly development review team meetings to discuss any proposed developments within the Town or to potentially be incorporated into the Town. These meetings ensure the effective execution of the Green Building Program and provide Town staff with an opportunity to discuss potential updates to the requirements.

The planning department utilizes demand forecasts when considering large annexations or potential developments to ensure that growth won't exceed the available supply. These demand forecasts are developed using the most current water usage data available, which reflect any water usage reductions resultant from the Green Building Program.

Section **4**

Section 4

Selection of Water Efficiency Activities

4.1 Selection Process

The Town will identify water conservation measures and programs that help it to manage its water use and its infrastructure as a first priority. Next the Town will evaluate those measures and programs that will help to reduce future water demands related to outdoor and seasonal water uses by its residential and largest commercial and irrigation customers.

4.1.1 Framework

The State of Colorado statute (CRS 37-60-126) requires entities that are planning for future water conservation to consider nine measures and programs that may improve local water use efficiency. In addition, the CWCB has recently created a Best Practices (BP) Manual (Aquacraft, 2010) that lists fourteen best practices that may be used by water utilities and special districts for local water conservation. The process of identifying potential water conservation measures and programs for the Town was influenced by these documents.

In addition, the CWCB has developed a new framework for evaluating water conservation plans and programs (Great Western Institute, 2010) in the State. The new framework identifies four categories of water conservation measures and programs as follows:

- Foundational Activities – those measures or programs that address the core mission and businesses of the water providing utility or district
- Targeted Technical Assistance and Incentives – a collection of activities that rely on indoor water efficient technologies and water-wise outdoor practices and can be implemented based on targeted customer categories.
- Ordinances and Regulations – those measures or programs that help control and reduce current and future water demands through regulation, ordinance, and policy. Similar to targeted technical assistance and incentives, ordinances and regulations can be implemented to target customer categories.
- Education Activities – A variety of techniques and methods to convey water efficiency information to the public. This category includes one-way education, one-way education with feedback, and two-way education.

Identification of water conservation measures and programs was performed using these four key headings and includes references to State requirements and best practices contained in the BP Manual.

4.2 Water Efficiency Activities

The specific water conservation measures and programs the Town supports are outlined below. The overall cost to implement all measures and programs in this plan is estimated to be about \$1.4 million over the next ten years. Because the majority of these costs have already been included in the Public Works capital improvement and operation budget, this plan outlines an additional \$200,000 for the planning horizon, approximately \$20,000 per year until 2030.

Future appropriations of Town funding for the various measures and programs contained herein cannot be guaranteed given that the nature of future Town priorities may change due to funding constraints, public health issues, or other unforeseeable issues. Based on the current economic climate the Town estimates available funds for additional conservation measures and programs at approximately \$250,000 for the next ten years, or \$25,000 per year. It is possible that a portion of the annual budget for water conservation could be funded from State grant programs currently administered by the CWCBC. These grant programs could be used to match Town funding (in-kind and cash) to conduct those activities that will best support the Town's overall goals and objectives for its water conservation measures and programs.

4.2.1 Identification

The Town of Superior has identified a select group of candidate water conservation measures and programs that address the key needs of the community with regard to future water use demand management. These measures and programs are grouped by the category they fall under.

4.2.1.1 Foundational Measures and Programs

The Town is most focused on implementing foundational measures and programs since these will not only improve the water use efficiency and profitability of the organization, but they are actions the Town has jurisdiction over, such that if chosen, the Town will be able to implement the selected measures and programs completely and to fruition.

4.2.1.1.1 System Wide Water Audit

The Town would benefit from an audit of overall water use, since non-revenue water use has increased to an average of about 7.0 percent in the last three years. The system wide audit would be performed using the guidelines and methods that AWWA has identified (AWWA, 2009), as further characterized by various regional water management agencies. The goal of the system wide audit would be to characterize current non-revenue water losses in both the potable and non-potable water systems through a review of current water production and delivery data. It would also identify water uses that may be unmeasured and/or unbilled and evaluate the accuracy

of Town and customer meters. The system wide audit would be used to better characterize real and apparent water losses and identify data gaps regarding measuring current non-revenue water within the Town's distribution system.

The cost of performing a system wide audit is variable depending on the level of detail desired and the availability of staff resources. At a minimum, the Town will need to commit staff resources from the Public Works, Finance, and Parks Departments to perform the audit. The Town would also need to commit some resources to implement recommendations identified during performance of the system-wide audit.

Actual water savings from the system wide audit can vary widely depending on the study findings. For example, the audit may find that a substantial amount of apparent losses exist as a result of inaccurate metering (although this is unlikely given that the Town replaces approximately 200 meters every year as part of an ongoing project). A more aggressive meter replacement program could help increase revenue for the Town. A reduction of apparent water losses by one percent could translate into increased water sales of about 4.5 million gallons annually or an increase in water sales revenue of about \$16,000 per year.

Other water savings may also be realized in association with the system wide audit including:

- Reducing unbilled water uses (which could account for another 1.5 to 2 percent of the Town's non-revenue water),
- Improving water and wastewater treatment plant operations,
- Reducing real losses (when coupled with improved metering and sub-metering of the distribution system).

4.2.1.1.2 Implement Recommendations from a System Wide Water Audit

The system wide audit may produce recommendations for implementation of various water saving or revenue generating activities, such as:

- Improve measurement of unbilled water uses (e.g., flushing flows, other Town uses),
- Increase meter testing and replacement efforts on large taps,
- Conduct additional acoustic testing of older distribution lines,
- Install sub-meters and valves in the distribution system to separate portions of the distribution system and allow for flow testing.

Each of these potential recommendations could help the Town improve its water use efficiency and the efficiency of its distribution system. No specific recommendations are presented at this time until the system wide audit is conducted beyond those activities discussed below, some of which are the continuation of ongoing Town programs.

4.2.1.1.3 Continue Distribution Piping System Acoustic Evaluation

In 2014, the Town conducted focused acoustic testing of about 90,000 feet of distribution system piping in locations of interest identified by Public Works. These testing efforts helped to pinpoint the location of specific leaks and areas for leak repair for the Public Works Department. The current Public Works budget includes \$10,000 for a continuation of the acoustic testing program into additional areas of interest.

Expanding the acoustic testing program may be warranted after the system wide audit is completed. No additional testing is recommended at this time until the system wide audit is completed.

4.2.1.1.4 Distribution System Piping Repair and Maintenance

The Town currently conducts line repair and maintenance as an ongoing component of operations. The work consists chiefly of repairing observed leaks in both the potable and non-potable systems and replacing old distribution lines. The Town maintains two separate line items in its annual budget for repair and maintenance including “repair and maintenance of potable lines” and “repair and maintenance of irrigation lines”. The current Public Works budget allocated for these two line items in 2019 are \$104,500 and \$41,800, respectively. These two programs continue throughout the planning period for this Plan (i.e., through 2030). Budget is expended based on need and may not be fully spent each year. No additional evaluation is necessary at this time.

Note that line replacement and/or maintenance may change in the future depending on the outcome of the system-wide audit that is recommended as part of Plan implementation. However, until the system-wide audit is conducted, various data gaps are addressed, and appropriate data is collected, additional line replacement and repair activities beyond those currently budgeted by the Town in its current CIP are not included in the Plan.

4.2.1.1.5 Meter Testing, Repair, and Replacement

The Town has ongoing programs to test, repair, and replace water meters for its customers. Since 2009, the Town has spent about \$50,000 on meter testing and repair efforts, which allowed for the testing of the majority of the commercial and irrigation account meters, plus some residential meters. Additional testing and repair efforts are not scheduled. The meter testing program may be renewed or expanded depending on the results of the system wide audit.

The Town also maintains a \$56,000 plus annual budget to replace water meters that are either old or suspected as being inaccurate. This program allows for replacement of approximately 5 percent of the Town’s residential customer meters in any one year, which translates to a complete replacement every 20 years.

The Town installed new meter vaults and meters on three large unmetered non-potable taps at a cost of \$87,000 in 2012. These meters help to reduce apparent losses in the Town’s non-potable water system.

4.2.1.1.6 Data Collection

Although this activity is not a specific water conservation measure and program identified during the previous task the Town will need to improve overall data collection and evaluation procedures to effectively implement this water conservation plan. The Town currently collects water use data and bills monthly for its customer segments (residential, multi-family, commercial, and irrigation). The Town could improve tracking of key customer water use behaviors with the following revisions:

- Track Town water use (including both potable and non-potable uses) as a separate customer segment,
- Further differentiate non-potable water use in the Town by the three Capital Improvement Plan categories that are tracked: parks, landscape fees, and special uses (i.e., the Superior McCaslin interchange).

In this way, the Town would be able to identify more readily effects of investments in water use efficiency related to the Town's operations (e.g., the irrigation controllers purchased in 2009 for parks and landscape fee area uses). There is minimal cost to the Town to make these minor upgrades to the customer tracking process.

Other improvements in data collection and water use tracking may be identified during the system-wide audit process. A cost of \$2,500 per year is included for implementation of new data collection and management efforts resulting from the system-wide audit.

4.2.1.2 Targeted Technical Assistance and Incentives

The CWCB has three levels of measures and programs associated with management of ongoing water use:

- Improve water use efficiency at Town facilities,
- Conduct evaluations and provide technical assistance to better understand the needs of the Town's customers,
- Provide incentives and/or perform retrofitting of customer facilities.

The Town is focused on improving those water uses that it controls first (i.e., improvement of water use efficiency at Town-owned facilities), then it will evaluate the need and efficacy of conducting technical assistance for its customers. To this point, the Town will first focus on conducting audits and assessments to better understand its own water use and plan infrastructure improvements to address recommendations of the audits and assessments.

4.2.1.2.1 Town Facility Audits

The Town is interested in auditing indoor water use at its own facilities, which include the Town administrative buildings, recreation facilities, and water and wastewater treatment plants. In all there are ten different buildings that house public and staff bathrooms, and staff kitchen facilities. The audits would be used to identify opportunities for improvements in water use efficiencies.

Given that the Town facilities are not tracked as a unique customer segment, Town water use was not calculated. However, it is estimated the Town facilities use about 7 million gallons of potable water per year. Based on these numbers, a water audit combined with a follow-up of appropriate retrofits of each facility could potentially reduce current indoor water demands by 15 to 30 percent or up to 2 million gallons per year. Audits for Town facilities are estimated to cost approximately \$7,500. In addition, auditing and retrofitting the Town's facilities is an important step in the Town's overall messaging related to the importance and need for water conservation to its customers and service area.

Outdoor irrigation audits of watering at Town landscape and park irrigation areas could also save significant amounts of non-potable water. The Town currently uses about 110 million gallons of non-potable water per year (based on the funds expended for Park Maintenance in the 2017 parks, landscape fee, and special use budgets). A modest savings related to improved operations of the Town's irrigation system could reduce non-potable water use by 5 percent, or about 5 million gallons a year at a cost of approximately \$1,000 per irrigation audit.

The Town could potentially characterize its carbon footprint and the potential reduction of its footprint based on the proposed water audit program. This would be achieved by incorporating the impact and cost of water treatment and delivery, and wastewater collection and treatment, as well as the cost of energy used to heat water. The audits would therefore support both water conservation program implementation and sustainability evaluations.

4.2.1.2.2 Residential Outdoor Irrigation Audits

The Town is currently a participating water provider with the Resource Central and currently pays \$12,000 per year for the program. Resource Central provides "Slow the Flow" outdoor water audits free of charge to residential customers that sign up. The Town will continue to promote this effort since residential water customers receive hands-on technical education and training regarding improved outdoor water use efficiency through this program. There were 59 residential participants between September 2017 and May 2018. These retrofits save an average of 5,000 gallons of water per resident annually.

The importance of Slow the Flow Audits to the Town will continue as it implements a residential outdoor irrigation rebate program in the future. Information collected through the Slow the Flow audits will support future residential irrigation equipment rebate programs. Using the Slow the Flow audits in conjunction with the outdoor rebate program should help to increase the amount of water saved by each of these programs working independently. More information about Slow the Flow can be found online at the Resource Conservation website.

4.2.1.2.3 Commercial and Irrigation Customer Audits

The Town is also interested in conducting audits to support water use efficiency efforts of its largest commercial and irrigation customers. These audits would focus on the largest and in some cases oldest, customers. The Town's largest water users are listed below with water usage in gallons per year (gpy) from 2009:

- Potable Water Use
 - Summit at Rock Creek Homeowners Association Building #19 (558,000 gpy)
 - Costco (1,693,000 gpy)
 - Rock Creek Village Strip Mall (1,743,000gpy)
- Non-Potable Water Use
 - Boulder Valley Schools Eldorado K-8 (679,000 gpy)
 - Boulder Valley Schools Monarch K-8 (22,639,000 gpy)
 - Town of Superior Irrigation (13,700,000 gpy)

The Town's audit program would be designed to address both the potable and non-potable water users, although more research is needed to evaluate and select the best customers.

The above listing simply provides some information that will allow for the quantification of potential water savings. At a cost of \$1,500 to \$2,000 per commercial or irrigation audit, the potential water savings are in the range of 15 to 25 percent of total water use (Vickers, 2001), which for the listed water customers would be about 8.7 million gallons, or about 27 acre-feet of water. Note that the Town would have to support specific retrofit activities in these selected facilities to realize a significant portion of these estimated water savings.

Nonetheless, water savings associated with the audits, independent of the follow-up retrofitting of inefficient fixtures and appliances are expected. Water savings that can be realized simply through the audit process relate to identifying and repairing ongoing leaks. For this reason, water savings are predicted for all Town supported customer audits. However, the water savings from the audits are predicted to be only a fraction of the 15 to 25 percent savings that are possible when follow-up retrofits have been implemented.

The predicted water savings related to the audits for residential, commercial and irrigation customers (estimated to be 1 percent of average annual water use for each audited facility) is proportional to the amount of water, on average, each customer uses.

The potential water savings related to the various audits is:

- Greatest for irrigation customers, which each use on average 2.5 million gallons of water annually;
- Then commercial customers, which each use on average 95,000 gallons of water annually; and
- Finally, residential customers, which use on average 60,000 gallons of water annually for outdoor use.

Therefore, irrigation audits and commercial audits are the most cost-effective of the audits the Town plans to conduct. For planning purposes, the Town has estimated that 50 Slow the Flow audits, 5 commercial audits and 7 irrigation audits will be conducted each year, beginning in a staggered manner as described in the implementation plan. One key point to consider is that the Town currently only has 68 commercial customers and 83 irrigation customers. The number of audits selected allows for conducting audits on 10 percent of current customers for these categories per year.

4.2.1.2.4 Other Technical Assistance Efforts

The Town has considered doing specific technical assistance programs in conjunction with the audits and various customer education and outreach efforts, as a means to maintain a consistent message of outdoor water use efficiency with its residential and irrigation customers. Technical assistance would consist of performing workshops on the following topics, for the specified target audience:

- Residential landscaping and water use,
- Commercial and other large irrigator landscaping and water use.

These technical workshops would be held for residents and local commercial operators, as well as landscape and irrigation professionals in the area. The attendees would be required to sign in such that the Town could track before and after water use, and thereby determine the effectiveness of the workshop.

The cost of the workshops would vary depending on the numbers in attendance. However, a 10-person workshop is estimated to cost approximately \$300 including advertising and hand out materials (excluding staff time). Savings on the order of 2 to 5 percent per attending customer have been reported by other local utilities including the City of Greeley and the Town of Castle Rock. Potential water savings from the residential workshops could range from 1,200 to 3,000 gallons per connection or up to 30,000 gallons per workshop.

The Town currently participates in the Resource Central “Garden in a Box” program, which delivers professionally packaged do-it-yourself xeriscape garden kits and planting designs to homeowners who are interested in native landscape options. It is anticipated the cost of the gardens (\$83 to

\$171 per “Garden in a Box”) prohibits customer non-participation once the garden is purchased. However, actual water savings may be limited depending on the ability of the homeowner to install the xeriscape plant materials in a segregated sprinkler zone. The Town could subsidize a portion of the costs to further encourage residents to participate in the program.

Workshops for commercial irrigators could provide larger water savings than the residential workshops based on the magnitude of irrigation water use, which is estimated to be about 2.5 million gallons per connection. A 2.5 percent reduction in water use resulting from the irrigation efficiency workshop would result in a demand reduction of approximately 62,500 gallons. However, landscaper and irrigation contractors may not be as permanent in their management of specific commercial locations as homeowners, and thus these savings may be transient.

Given the current limitations in Town staff availability, and other programs that are more effective in reducing future water use demands within the Town’s service area, the technical assistance programs were not selected for implementation within the current planning horizon.

4.2.1.2.5 Rebates and Retrofits

For purposes of this discussion, retrofits will be those fixture and appliance upgrades that are conducted for a finite period of time using grant funding whenever possible, whereas rebates will be ongoing programs that are funded by and administered by the Town.

4.2.1.2.6 Indoor Retrofits for Town Facilities and Commercial Customers

The Town has a number of opportunities to conduct either rebates or retrofits as a service to its customer base. First and foremost, the Town desires to retrofit its own facilities with high-efficiency fixtures and appliances, where such an action is determined to be cost-effective and practical. It is anticipated for example that the Town would be able to install more efficient faucet aerators on bathroom sinks in all of its facilities. Given that sink aerators are inexpensive and relatively simple to replace this retrofit effort could be completed during the audit process. Similarly, more efficient showerheads could be installed at the Town’s recreation center and police station, again as part of the audit process. It is anticipated that retrofitting sink aerators and showerheads will not only reduce future water demand for the Town, but it will also reduce future energy demand as well. Therefore, these two retrofits would be of value to the Town even if installed prior to the audit analyses. For purposes of this planning effort, it was assumed that 90 sinks and 12 showerheads would be retrofit during the audit process.

Other more expansive retrofitting on the Town’s facilities (e.g., high efficiency toilets, low flow or waterless urinals, etc.) would not be warranted until after the audit analyses have been completed and a cost-benefit analysis can be completed. For the purpose of this planning effort, it has been assumed that 20 toilets in the Town’s facilities and 10 urinals in the Town’s facilities would be replaced after the audits have been completed.

Similar to the Town program, the commercial retrofits would be conducted in phases, with sink aerators, and whenever possible showerheads, installed during the audits, and toilets and urinals,

and other high efficiency devices (e.g., washing machines, ice makers, etc.) installed only after a cost-benefit analyses has been conducted based on data collected during the audit. For cost purposes it was assumed that 50 faucet aerators per year would be installed in conjunction with the commercial audits. Although it may be that the audits find specific benefits for conducting additional commercial retrofits, no other fixtures or appliances are included for installation at existing commercial customers in the current planning period.

4.2.1.2.7 Indoor Rebates for Residential Customers

The Town has implemented an indoor rebate program for its residential customers to support and promote its ongoing water conservation efforts in a manner that educates and engages its largest customer base: residential customers. In addition, the Town believes that its residential customers expect a utility-based rebate program as part of the local culture. The indoor residential rebate program supports the appropriate replacement of toilets, dishwashers, showerheads and washing machines using up to \$100 per fixture/appliance rebate for up to 100 rebates.

4.2.1.2.8 Outdoor Irrigation Equipment Rebates for Residential Customers

The Town's water conservation goals are chiefly focused on reducing summertime peak water use. For this reason, the Town has implemented an outdoor irrigation equipment rebate for its largest customer category, residential customers. The residential irrigation equipment rebate program focuses on improving individual customer efficiencies by replacing older equipment with more water efficient alternatives, including WaterSense-certified irrigation controllers and rotary sprinkler nozzles.

Evapotranspiration (ET) controllers are effective in improving outdoor water use efficiency by reducing the number of watering days and by improving the manner in which the irrigation water is applied to the turf and plant materials. For purposes of this planning effort it was estimated that ET Controllers would improve the efficiency of outdoor irrigation application by about 12 percent. ET Water, a manufacturer of ET controllers and other water management devices, estimates savings between 30 to 50 percent. For cost purposes, it was assumed that one hundred of the \$80 rebates would be provided for annually under the Town's ET Controller residential rebate program.

The use of rainfall sensors would also reduce outdoor water use. However, rainfall sensors only impact whether or not a scheduled irrigation event will occur or not, compared to an ET controller which can alter irrigation timing and water application rates. Rainfall sensors were assumed to improve irrigation efficiency by about 5.5 percent. For cost purposes it was assumed that fifty of the \$50 rebates would be provided for annually under the Town's future rainfall sensor residential rebate program.

Finally, the Town would provide replacement pop-up spray heads using MP rotators, which improve irrigation application efficiency by about 20 percent (Hunter, 2010). For cost purposes, it was assumed that 30 new MP rotators would be provided to each of 15 homes per year at a cost of \$225 per home. The homeowners would be responsible for completing the installation and the

Town (or a Slow the Flow auditor) would have to go to the home and verify installation before the check would be provided to the homeowner.

4.2.1.2.9 Retrofits for Commercial and Irrigation Customers

The Town has an opportunity to support the significant reduction of non-potable water summertime demand through the retrofit of outdoor irrigation equipment for its largest water users, irrigation and commercial customers. Although there are relatively few of these customers, each of these customers use as much as 80 times more outdoor irrigation water than does the average residential customer.

For the commercial and irrigation customer retrofit program, the Town would only implement ET Controller and rainfall sensor programs since the MP rotator program would be cost prohibitive at the scale of these particular customers. For cost purposes it was assumed that ten ET controllers and ten rainfall sensors would be installed each year for these customer types (e.g., install one each at 5 commercial customers and one each at 5 irrigation customers, or some combination thereof for a total of 10). Using this rate of installation, all irrigation customers could have ET Controllers within eight years.

4.2.1.3 Ordinances and Regulations

The Town currently has a watering ordinance that restricts watering time based on time of day, in order to limit the amount of water lost to evapotranspiration. This ordinance allows the Town to enforce fines and penalties for non-compliance to time of day restrictions.

The Town also has established a Green Building ordinance that impacts all new residential development. The ordinance requires new residential construction and renovation projects to meet minimum efficiency requirements. The new dwelling has to meet “green point” requirements based on the project type and square footage. Many of the points are energy related, such as evaporative cooling, solar power, and efficient windows. However, there are several points that would conserve water. The Town is looking to develop a similar Green Building code for new commercial construction.

There is no additional cost to the Town to develop Green Building codes for commercial development beyond what is already in place for administering the Green Building requirements for new residential construction. Town plan review, construction site review and inspection, and permitting must all work together to enforce the code requirements. Any new Green Building code would carry with it the cost for training staff to appropriately implement the code and facilitate its intent.

Currently there is not adequate data to estimate costs and benefits of implementing the ordinances listed above, in part because the ordinances have either been sparingly enforced (e.g., water waste ordinance) or have not been in place long enough to provide for estimating ongoing water savings (e.g., green residential building code). Implementation of these ordinances will

therefore require that appropriate data be collected to indicate the value of the effort and to verify that water demand reductions are actually occurring.

4.2.1.4 Education Activities

The Town currently conducts limited education of and outreach to its customers. The Town does not anticipate increasing its educational efforts substantially although it will need to advertise its new programs, especially its residential programs, to increase participation. Education and outreach will be conducted therefore by including information on the Town's website, creating printed materials that can be placed in high visibility areas, and creating published articles regarding the Town's efforts, beginning with the publicity around the creation and implementation of this Plan.

The Town will continue its practice of providing a door hanger with facts regarding water use efficiency and water conservation to new homeowners upon move in. This information helps to instill a culture of water use awareness. It also helps to inform new customers about the Town's water conservation programs.

The Town currently budgets \$5,000 per year for education and outreach. This cost will continue into the future.

4.2.2 Qualitative Screening

A wide variety of water efficiency programs and measures were considered for the evaluation of candidate measures and programs will be completed using these three evaluation techniques:

- Cost benefit analyses which will be conducted by calculating the cost for each acre-foot of future water demand reduction.
- Weight of evidence which uses information from the literature and other sources to identify the benefit and appropriateness of selected measures and programs.
- Continuation of ongoing programs which have been identified as being effective in reducing water demand.

Overall, the water efficiency activities and programs will be selected because they address key water conservation needs of the Town including:

- Reduce non-revenue water losses (real and apparent);
- Reduce outdoor water use; and
- Support the Town's efforts to be recognized as a "green community".

4.2.3 Evaluation and Selection

Using the framework and qualitative screening criteria outlined above, the Town is able to evaluate measures and programs that share common characteristics. For example, the Town can compare expanding ongoing foundational programs without necessarily completing detailed cost benefit analyses, since these measures and programs are known to be a priority for managing water deliveries and generating revenue. In addition, the Town can use the framework to select measures and programs from each broad category without direct comparison. For example, educational and outreach programs do not provide water demand reductions that are explicitly measurable. However, educational efforts are known to be integral to the implementation and maintenance of long-term water conservation savings. Appendix A includes the Water Efficiency Activity Evaluation and Selection Matrix.



Section 5

Section 5

Implementation and Monitoring Plan

5.1 Implementation Plan

Using the evaluation and selection matrix included in Appendix A, the Town has identified measures and programs to implement to reduce future customer water demand. This plan provides the Town with a complete roadmap to pursue meaningful water conservation. Future capital funding and annual budgets will be developed considering the funding requirements presented in the preceding chapters. However, future appropriations of Town funding for the various measures and programs contained herein cannot be guaranteed given that the nature of future Town priorities may change due to budget constraints, public health issues, or other unforeseeable issues.

The implementation plan for water conservation supported by the Town needs to maintain flexibility to adapt to changing needs and requirements of not only the Town's resources, but the water conservation program as well. As portions of the water conservation program are implemented, new data and information will be acquired which may influence future water conservation programs. Therefore, this Plan will be implemented in an adaptive management approach, incorporating changing conditions and influences into water conservation activities planned and executed by the Town.

Given this framework and understanding the Plan is best served through the identification of the sequencing of the various selected water conservation measures and programs; and a listing of those measures and programs that are of the highest priority to the Town as of this planning effort.

5.1.1 Sequencing

Although the Town understands and supports the implementation of meaningful water conservation, its resources are not unlimited; therefore, it has chosen to sequence the implementation of its selected water conservation measures and programs in accordance with its current needs, expectations for future fund allocations, and the logical connection and interaction between specific measures and programs. For example, retrofitting existing Town facilities with high efficiency toilets and urinals is best conducted after the facilities are audited to determine the cost and benefit related to any specific installation. Similarly, a system-wide audit of the Town's water treatment, distribution, and billing systems will be used to inform decisions to implement new meter testing, repair, and/or installation activities.

There are a number of measures and programs that are spread out over a three-year period starting in 2019. These activities, many of which are one-time efforts, will be used to collect data and information to better characterize current water use within the Town such that more meaningful water conservation measures and programs can be devised and implemented. These data will be used to identify data gaps, develop cost-benefit analyses, and prepare grant requests in support of the Town's water conservation efforts.

5.1.2 Priorities

For the Town, the implementation of water conservation to support future demand reduction begins with the management of current non-revenue water, which aligns with one of the State-defined foundational water conservation elements. Non-revenue water includes both apparent losses that effect Town billings and revenue; as well as real losses, which effect Town operational costs. The Town is focused on reducing the current level of non-revenue water, currently estimated to be about 7 percent of total treated water per year, to about 5 percent in the next 10 years. To achieve this goal, the Town will need to:

- Improve meter reading accuracy on existing accounts,
- Identify and measure unmetered water uses, and
- Continue testing and repair of water distribution lines to manage leaks and other real losses between the treatment works and customer meters.

These are the greatest current priorities for the Town. Those items listed in the following paragraphs are next highest in priority.

Pricing of the Town's water with respect to both the generation of revenue to cover actual fixed and variable costs, and to promote water use efficiency by its customers, is another high priority set of activities.

The next highest priority for the Town will be to conduct those measures and programs that improve the water use efficiency of the Town's facilities. These measures and programs include facility audits and appropriate retrofits and replacements.

Other water conservation measures and programs that support a better understanding of specific customer uses and improve their water use efficiencies, while considered important to the management of future water demand, are considered less important than those measures and programs discussed above.

5.2 Monitoring and Evaluation

It is important to identify an approach to monitoring as many of the measures and programs as possible so the value of each program can be evaluated. Some measures and programs such as customer education and increasing water rates will not be measured directly but can be generally

tracked through annual average water use and per capita water use. Other measures and programs, such as the audits conducted on large water users, can be monitored on an individual basis. The Town will also need to create a procedure for tracking waster use at Town facilities to monitor these water savings separately. Monitoring efforts and metrics that the Town proposes are summarized in **Table 5-1**.

Table 5-1
Summary of Monitoring Methods for Estimating Water Savings

| Conservation Measure/Program | Non-Revenue Water | Quantity of Audits/Rebates /Meter Replacements | Individual Water Use | Per Connection Water Use | Monthly Water Use |
|--|-------------------|--|-------------------------|--------------------------|-------------------|
| System-Wide Audit | X | | | | |
| Leak Repair | X | | | | |
| New Meter Installation and Replacement | X | X | | | |
| Water Rate Increase | | | | X | X |
| Town Facility Audits | | | X (Town facil. only) | X | |
| Residential Audits | | X | X | X | |
| Residential Rebates (Indoor and Outdoor) | | X | X | | X |
| Commercial Audits | | X | X | | X |
| Commercial Rebates/Retrofits | | X | X | | X |

On an annual basis the Town will monitor the metrics proposed above. The results will be reported to the Town's Board of Trustees. These annual reports will help prepare the Town for updating the conservation plan every seven years as required by the CWCB. The next update will be required in 2026.

Section **6**

Section 6

Public Review, Adoption, and Approval of Plan

6.1 Public Review

The Draft Water Conservation Plan was available for public comment for 60 days beginning on May 9, 2019. Notice of the opening for public comment was provided using the following media:

- Notice was posted on the Town's website with a copy of the complete draft Plan available in PDF format.
- Distribution of a Town E-newsletter to current subscribers

The notice included a description of how the public could submit comments to the Town for consideration. The Town received a total of one public comment on the Draft Water Conservation Plan. To the extent possible, comments have been addressed in this updated Plan. A copy of the published public notice announcement and copies of the comment received and corresponding responses can be found in **Appendix B**.

6.2 Water Conservation Plan Adoption

Superior Planning Department and Public Works and Utilities Department staff reviewed this Water Conservation Plan and made comments, after which the public review period began. The plan was updated to address public comments before final submittal to the Town Board of Trustees (Board) for adoption. On July 8, 2019 the Board adopted the Water Conservation Plan with the updates included in this final version. A copy of the Board resolution documenting the adoption of this Water Conservation Plan is included in **Appendix C**.

6.3 Water Conservation Plan Approval

The Draft Water Conservation Plan was initially submitted to the CWCB Office of Water Conservation and Drought Planning on May 10, 2019, during the public review period, and received conditional approval on June 18, 2019 pending the resolution of CWCB staff comments. Comments from the CWCB review have been addressed in this updated final version.

6.4 Periodic Review and Updates

The Town will be responsible for updating this Water Conservation Plan every seven years as required by the CWCB. The next update required will be no later than 2026. However, because water efficiency strategies and activities are typically an ongoing process, it is recommended that the Town Board of Trustees and Utility Department staff perform periodic reviews to ensure the Town is in compliance with the Plan.

Appendix

| FOUNDATIONAL WATER CONSERVATION | State Statute Req's | CWW BP | Comments | Specific Issues | Screening Results |
|---|---------------------|-------------|--|--|--|
| Metering | V, VII | BP 1 | | | |
| Submetering of Commercial Entities | | | The Town has separated its distribution systems for commercial indoor and outdoor uses. In addition, the largest outdoor water users (e.g. HOAs and parks) are also on non-potable water supplies. | Submetering is already in place in the Town | Do not move forward to evaluation |
| AMR Installation and Operations | | | The Town is interested in installing AMR devices on customer meters, but the cost of the initial installation is currently prohibitive. | The Town would benefit from AMR; however, the Town is currently reading customer meters and billing monthly. Costs are expected to be prohibitive at this time. | Do not move forward to evaluation |
| Metering of Town Water Uses | | | Town needs to improve current metering of its own water uses, including flushing flows, WTP and WWTP uses. | Town needs to improve its understanding of non-revenue water, and better metering would assist in this. | Perfrom as outcome of systemwide water audit |
| Meter Testing and Replacement | | | Some of the Town's water meters are more than 10 years old and therefore more aggressive meter testing and replacement is warranted to ensure that the Town has an accurate reading of water us for each customer. | The Town would benefit from more aggressive meter testing and replacement, especially for larger water use customers. | Town is currently funding a meter testing and repair program as well as a meter replacement program. No additional analysis will be performed. |
| Meter Upgrades | | | The Town is interested in improving the accuracy of its meters to read at less than 1,000-gallon incrememts. However, costs associated with large-scale replacement (3,000+ meters) is prohibitive. | | Do not move forward to evaluation |
| Conservation Oriented Rates | VII, VIII | BP 1 | | | |
| Water Rate Increase | | | The Town has had its current water rate structure since 2015. Increases to rates should be considered as a means to build funds for future projects. | | Move forward to evaluation |
| Inclining Block Rate Adjustments | | | The Town currently has a tiered rate structure for all its customer classes and does not currently have plans to re-evaluate the structure. | Does not make sense to pursue until the Town has fine-tuned other areas of water efficiency. | Do not move forward to evaluation |
| Water Budgets | | | | The Town does not currently have the means to develop lot and customer specific water budgets. | Do not move forward to evaluation |
| Tap Fees with Water Conservation Incentives | | | The Town may develop a tap fee structure that creates incentives for green building and water smart homes and businesses. | Does not make sense to pursue until the Town has fine-tuned other areas of water efficiency. | Do not move forward to evaluation |
| System Water Loss Control | V | BP 3 | | | |
| System Wide Water Audit (AWWA M-36 Methodology) | | | The Town has recently conducted an AWWA audit of its sytem wide water uses and tracking | The Town may need to increase the level of accuracy used to preliminary analysis and commit more resources to better characterize non-revenue water | Move forward to evaluation |
| Leak Detection Programs | | | The Town desires to better characterize real and apparent water losses to reduce its non-revenue water | The Town may need to increase the level of accuracy used to preliminary analysis and commit more resources to better characterize non-revenue water | Move forward to evaluation |
| Improved Water Use Monitoring | | | The Town desires to permanently improve the accuracy and regularity of data collection used to characterize water usage. | This is linked to AWWA Water Loss Audits, which in turn rely on better meter testing and replacement to produce accurate results. | Move forward to evaluation |
| Pipe Lining and Replacement | | | The Town would consider distribution and transmission pipe lining if data existed to indicate that pipelining would be effective in reducing non-revenue water | The Town will not initiate this task unless AWWA Water Loss Audit results indicate significant real losses due to pipe condition. | Do not move forward to evaluation |
| Infrastructure Replacement Program | | | The Town would benefit from a more aggressive infrastructure replacement program, which should address timeline and funding for upgrades to the Town's tranmission and distribution systems. | The Town will need to perform this task independently of the Water Efficieny Plan, but should include information regarding the frequency and results whenever the Plan is updated | Do not move forward to evaluation |

| Data Collection - Monitoring and Verification | | | | | | |
|--|--|---------------------|---|---|---|---|
| Customer Categorization in Billing System | | | The Town currently tracks residential single family, multi-family, commercial, and irrigation water uses. It could benefit from more specific tracking of Town water uses and tracking of commercial and irrigation water uses by industry code | The Town is small enough (fewer than 80 commercial customers and 90 irrigation customers) that improved classification is unnecessary at this time | Do not move forward to evaluation | |
| Integrated Resource Planning | | | The Town currently links its Water Efficiency Plan with its water supply planning, wastewater planning, and overall water resources planning | | Continue this activity, futher evaluation is unnecessary | |
| Conservation Coordinator | | | | A full-time staff position would be redundant if Town continues to participate in Resource Central due to the breadth of services offered to their members | Do not move forward to evaluation | |
| TARGETED TECHNICAL ASSISTANCE AND INCENTIVES | | State Statute Req's | CWW BP | Comments | Specific Issues | Screening Results |
| Town Facility Efficiency | | I, II, VI | BP 10, 14 | | | |
| Facility Indoor Audits | | | | The Town has a number of facilities that would benefit from audits to determine the cost and replacement value of indoor fixtures and appliances | Audits should target those facilities expected to benefit most from fixture and appliance replacements | Move forward to evaluation |
| Facility Outdoor Audits | | | | The Town has a number of facilities that would benefit from audits to determine the cost and related benefits associated with upgrades to equipment and changes to current outdoor irrigation practices | Audits should target those facilities expected to benefit most from upgrades to equipment and changes to current outdoor irrigation practices | Move forward to evaluation |
| Facility Retrofits and Replacements - Indoor | | | | Retrofits and replacements should be focused on faucet aerators, toilets and/or urinals, and showerheads | | Move forward to evaluation |
| Irrigation System Upgrades | | | | Upgrades should focus on replacing aging equipment and deteriorating infrastructure or the addition of a central control system to improve efficiency of irrigation practices | Highly dependent on availability of funds | Move forward to evaluation |
| Existing Customer Water Audits | | VI | BP 10, 13, 14 | | | |
| Residential Indoor Audits | | | | | Domestic per capita water use is currently about 80 gpcd, which is within typical ranges for the United States. | Do not move forward to evaluation |
| Residential Outdoor Audits | | | | | The Town currently participates in Slow the Flow, a Resource Central program | Move forward to evaluations |
| Commercial Facility Audits | | | | Focus on high water use facilities | | Move forward to evaluations |
| Irrigation Customer Audits | | | | Focus on high water use facilities | | Move forward to evaluations |
| Existing Customer Technical Assistance | | III, VI | BP 9 | | | |
| Landscape Design and Maintenance Workshops | | | | Focus workshops on landscape design for homeowners, HOA Boards, developers, and landscape designers | Participation is voluntary and evaluation of impacts requires residential participants to track their water use | Do not move forward to evaluation |
| Garden in a Box | | | | Town currently participates in Resource Centra'ls Garden in a Box program | | Do not move forward to evaluation, maintain program participation |
| Residential Customer Water Use Workshops | | | | Since 50% of residential water use is outdoors, focus workshops on residential outdoor water use and xeriscape concepts | Participation is voluntary and evaluation of impacts requires participants to track their water use | Move forward to evaluation |
| Commercial Customer Water Use Workshops | | | | Focus workshops on specific types of commercial water uses (e.g. restaurants or car washes) | Participation is voluntary | Move forward to evaluation |
| Irrigation Customer Water Use Workshops | | | | Focused workshops on irrigation practices and technologies for HOA Boards, irrigation contractors, landscape contractors, etc. | Participation is voluntary and evaluation of impacts requires residential participants to track their water use | Move forward to evaluation |
| Rebates and Retrofits | | X | BP 12 | | | |
| Residential Indoor Fixture and Appliance Rebates/Retrofits | | | | Based on the findings of audits, the Town may choose to implement selected Indoor fixture and/or appliance rebates | Domestic per capita water use is currently about 80 gpcd, which is within typical ranges for the United States. | Do not move forward to evaluation |
| Commercial Indoor Fixture and Appliance Rebates/Retrofits | | | | Based on the findings of audits, the Town may choose to implement selected Indoor fixture and/or appliance rebates | | Move forward to evaluation |

| | | | | | |
|---|---------------------|---------|---|--|---|
| Irrigation Equipment Rebates/Retrofits | | | Based on the findings of audits, the Town may choose to implement selected outdoor irrigation upgrades and/or rebates | | Move forward to evaluations |
| Turf Replacement Program/Xeriscape Incentives | | | Incentives will focus on new construction controls of plant materials as more cost effective than turf replacement programs to manage future demand | Town is near buildout, few opportunities for incentives to be utilized | Do not move forward to evaluation |
| ORDINANCES AND REGULATIONS | State Statute Req's | CWW BP | Comments | Specific Issues | Screening Results |
| Water Waste Ordinances | | BP 5 | | | |
| Time of Day Watering Restrictions | | | Utilize time of day watering restrictions from 10 am to 6 pm for all days in the months from May to September | Cost is for seasonal employees, Town will assess using Town staff only | Move enforcement of current ordinance to evaluation |
| Day of the Week Watering Restrictions | | | | not something that Town Council will pass | Do not move forward to evaluation |
| Water Overspray Limitations | | | Create limits for irrigation overspray | Difficult to assess and enforce | Do not move forward to evaluation |
| Commercial Certifications | | | Develop certification program for water efficient commercial businesses | No benefit beyond public | Move forward to evaluation |
| Landscape Design and Installation Rules and Regulations | III | BP 8 | | | |
| Landscaper Certification and Training | | | Develop and implement landscaper certification program - must be connected with Town permitting and planning processes (including inspections and awarding of certificates of occupancy) | Town lacks resources at this time to implement, and Town is at 98% build-out, so there are limited opportunities for new construction to change total water demand | Do not move forward to evaluation |
| Irrigation System Installer Certification and Training | | | Develop and implement irrigation installer certification program - must be connected with Town permitting and planning processes (including inspections and awarding of certificates of occupancy) | Town lacks resources at this time to implement, and Town is at 98% build-out, so there are limited opportunities for new construction to change total water demand | Do not move forward to evaluation |
| Rules for New Construction | IX | BP 11 | | | |
| Indoor Plumbing Requirements | | | Develop and implement indoor plumbing requirements for new homes and/or businesses - must be connected with Town permitting and planning process (including inspections and awarding of certificates of occupancy) | Town has residential Green Building requirements that influence indoor water use in all new homes and businesses | Town has already committed resources to this effort |
| Outdoor Irrigation Requirements | | | Develop and implement outdoor irrigation requirements for new homes and/or businesses - must be connected with Town permitting and planning process (including inspections and awarding of certificates of occupancy) | Town has residential Green Building requirements that influence outdoor irrigation in all new homes and businesses | Town has already committed resources to this effort |
| Outdoor Turf and Landscaping Requirements | | | Develop and implement indoor turf and landscaping requirements for new homes and/or businesses - must be connected with Town permitting and planning process (including inspections and awarding of certificates of occupancy) | Town has residential Green Building requirements that influence outdoor turf and landscaping in all new homes | Town has already committed resources to this effort |
| Commercial Cooling and Process Water Requirements | | | Develop and implement commercial cooling and process water requirements for new homes and/or businesses - must be connected with Town permitting and planning process (including inspections and awarding of certificates of occupancy) | Town lacks resources at this time to implement, and Town is at 98% build-out, so there are limited opportunities for new construction to change total water demand | Do not move forward to evaluation |
| Town Facility Requirements | | | Develop and implement Town facility water use requirements for new homes and/or businesses - must be connected with Town permitting and planning process (including inspections and awarding of certificates of occupancy) | Town has no current plans to construct new municipal facilities | Do not move forward to evaluation |
| Rules for Existing Construction | IX | BP 8, 9 | | | |
| Point of Sales (POS) Requirements | | | Develop and implement POS requirements for real estate sales and transactions | Town lacks resources at this time to implement, and Town is at 98% build-out, so there are limited opportunities for new construction to change total water demand | Do not move forward to evaluation |

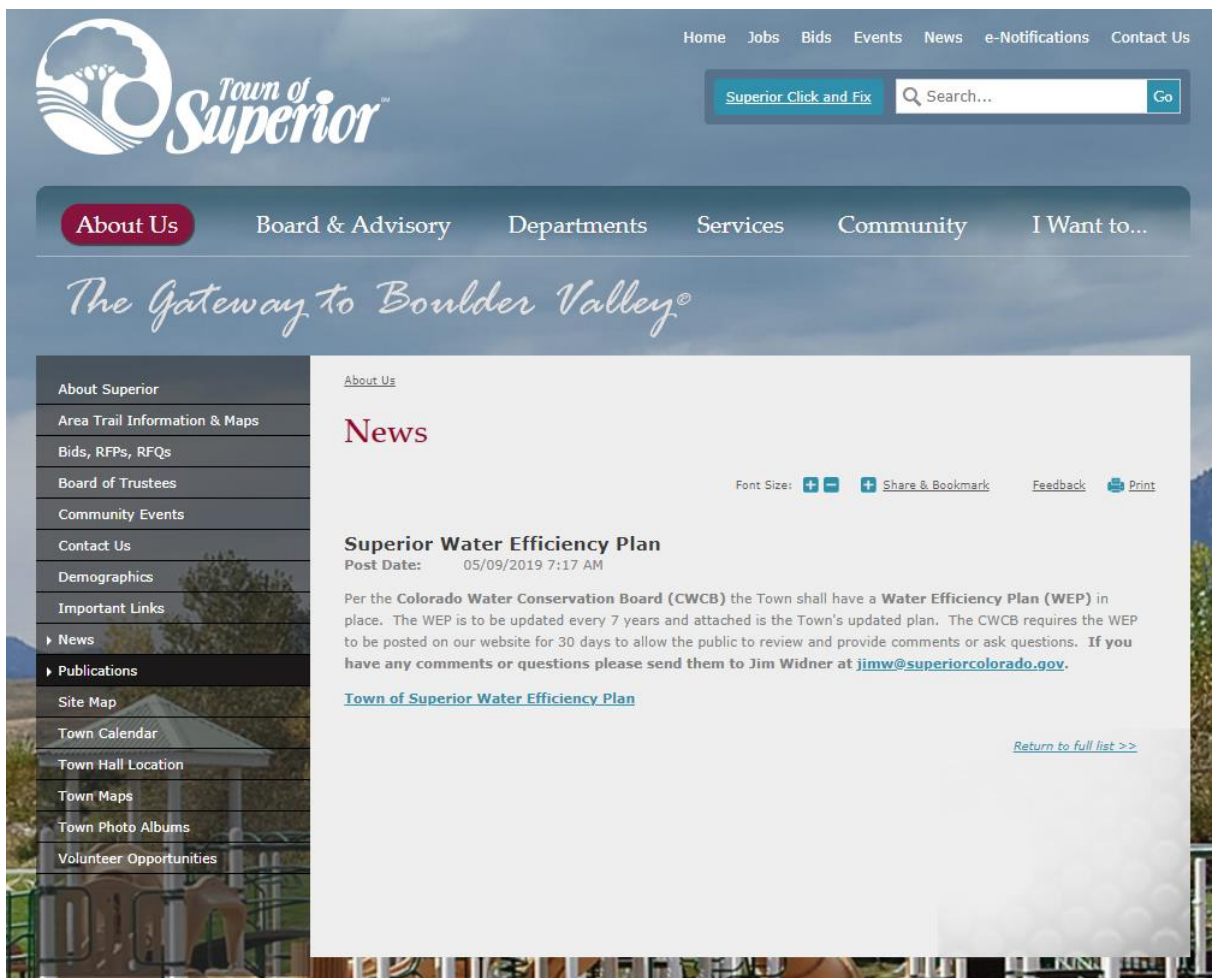
| | | | | | |
|---|---------------------|--------|---|--|---|
| Alternative Water Supply Options | | | Develop and implement alternative water supply regulations for Town | Town lacks resources at this time to implement, and Town is at 98% build-out, so there are limited opportunities for new construction to change total water demand | Do not move forward to evaluation |
| Commercial Cooling and Process Water Requirements | | | Develop and implement commercial cooling and process water requirements for existing facilities | Town lacks resources at this time to implement, and Town is at 98% build-out, so there are limited opportunities for new construction to change total water demand | Do not move forward to evaluation |
| Outdoor Irrigation Requirements | | | Develop and implement outdoor irrigation system requirements (e.g. ET Controller requirements) | Town lacks resources at this time to implement, and Town is at 98% build-out, so there are limited opportunities for new construction to change total water demand | Do not move forward to evaluation |
| EDUCATIONAL ACTIVITIES | State Statute Req's | CWW BP | Comments | Specific Issues | Screening Results |
| One Way | VI | BP 6 | | | |
| Bill Stuffers, Newsletters, Mailings | | | Town currently maintains a website with water conservation tips, newsletters, and bill stuffers | Need to link any expenditures for printing and mailing to overall Town water message campaign | No specific cost/benefit analysis will be performed, but measure will be recommended as part of the Water Efficiency Plan |
| Two Way | VI | BP 6 | | | |
| K-12 Education | | | Town is interested in supporting local K-12 water education activities | The Town already works in coordination with the Keep It Clean Partnership and Project WET; would require adding water supply and conservation to the curriculum | No specific cost/benefit analysis will be performed, but measure will be recommended as part of the Water Efficiency Plan |
| Messaging Campaign/Development | | | The Town does not have a water messaging campaign, it relies on messaging within the watershed | The Town would benefit from a messaging campaign to link its various water conservation efforts with water rates, water waste ordinances, etc. | No specific cost/benefit analysis will be performed, but measure will be recommended as part of the Water Efficiency Plan |
| Two Way | VI | BP 6 | | | |
| Citizens Advisory Group | | | The Town currently maintains a Citizens Advisory Board on water and other issues | The Town should evaluate creation of a citizens advisory group to augment current Town Board efforts | No specific cost/benefit analysis will be performed, but measure will be recommended as part of the Water Efficiency Plan |
| Customer Surveys | | | The Town does not currently utilize surveys | | Do not move forward to evaluation |

Appendix B

Public Notice Announcement and Public Comments

B.1 Public Notice Announcement

A Public Notice, reprinted below, was published on May 9, 2019 on the Town of Superior website: <https://www.superiorcolorado.gov/Home/Components/News/News/3343/17>. Public comments on the Superior Water Efficiency Plan were requested via email to: jimw@superiorcolorado.gov.



B.2 Comments Received

The 60-day public review process was held from May 9, 2019 through July 8, 2019. During this period, one written comment was submitted. A copy of the correspondence is attached to this appendix.

Adrienne Angelos

From: Jim Widner <jimw@superiorcolorado.gov>
Sent: Tuesday, July 2, 2019 8:52 AM
To: Ian Brogden (ian.brogden@gmail.com)
Cc: Adrienne Angelos; Joel Price
Subject: RE: WEP

Ian,

Thanks again for your comment on the Water Efficiency Plan; we have revised the plan based on your comment. Following is an explanation of how projections were determined and some background on BVSD rates.

Development:

Section 2 has been updated to include population projections that are tied directly to known developments that will be completed within the planning horizon. Residential demand projections were also updated to reflect the changes to population projections.

Irrigation:

Irrigation demand projections were determined using a projected annual irrigation growth rate that was based on actual change in irrigation tap numbers from 2013-2018 and an average daily irrigation water use rate per connection.

User Rates:

\$188 was the base monthly fee for Boulder Valley School District in 2018 (the final draft WCP has been updated to reflect the 2019 user rates), which is in addition to their monthly usage fees that fluctuate based on their metered usage. For comparison, all in-district irrigation customers paid a monthly base fee of \$13.37 per month. Superior Elementary falls under the "Governmental" customer category and pays the fees presented in Table 2-2 and Table 2-3 (page 2-3) according to potable and non-potable use.

Boulder Valley School District pays a **base fee** of \$188 per month in addition to a usage fee of \$3.04 per thousand gallons for irrigation at Monarch K-8. For comparison, all in-district irrigation customers pay a base fee of \$13.37 per month and a usage fee of \$2.80 per thousand gallons. Superior Elementary falls under the "Governmental" customer category and pays the fees presented in Table 2-2 and Table 2-3 (page 2-3) according to potable and non-potable use.

If you have other questions or comments please do not hesitate to contact me.

Thanks,
Jim

Jim Widner, P.E.
Utilities Superintendent
124 E. Coal Creek Drive
Superior, CO 80027
jimw@superiorcolorado.gov
Office: 303-381-2013



From: Jim Widner
Sent: Monday, May 13, 2019 7:55 AM
To: 'Ian Brogden'
Subject: RE: WEP

Thanks Ian! We are working with the planning dept for the development projects and will revise.
I'm so glad Slow the Flow is making an impact 😊

Jim Widner, P.E.
Utilities Superintendent
124 E. Coal Creek Drive
Superior, CO 80027
jimw@superiorcolorado.gov
Office: 303-381-2013



From: Ian Brogden [mailto:ian.brogden@gmail.com]
Sent: Saturday, May 11, 2019 9:42 AM
To: Jim Widner
Subject: WEP

Hi Jim,

The plan doesn't seem to take into account population growth from Downtown Superior and other new residential developments. I would think irrigation would also increase significantly with the addition of new green space.

Monarch K-8 only pays \$188/month?
I didn't see Superior Elementary listed..

Slow the Flow was really valuable for us, we were able to reduce usage considerably.

Ian Brogden

TOWN OF SUPERIOR
RESOLUTION NO. R-40
SERIES 2019

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF
SUPERIOR APPROVING THE ADOPTION OF THE 2019 WATER
CONSERVATION PLAN

WHEREAS, the Town is a participant in the Windy Gap Firing Project, which involves the use of facilities owned and operated by the Bureau of Reclamation ("BUREC");

WHEREAS, the BUREC requires all participants in the Windy Gap Firing Project to have a Water Conservation Plan that has been approved by the Colorado Water Conservation Board;

WHEREAS, Superior also desires to maintain a Water Conservation Plan as a responsible water user;

WHEREAS, Superior has updated its 2011 Water Conservation Plan pursuant to C.R.S. § 37-60-126 and the associated guidelines issued by the Colorado Water Conservation Board; and

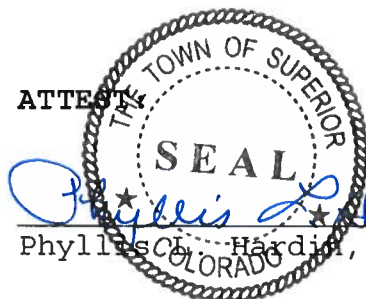
WHEREAS, C.R.S. § 37-60-126 and the associated guidelines issued by the Colorado Water Conservation Board require Superior to adopt the Water Conservation Plan prior to submittal to the Colorado Water Conservation Board for approval.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF SUPERIOR, COLORADO, as follows:

Section 1. The Board of Trustees adopts the 2019 Water Conservation Plan.

ADOPTED this 8th day of July, 2019.

ATTEST



Phyllis L. Hardin, Town Clerk-Treasurer



Clint Folsom, Mayor

SUPERIOR METROPOLITAN DISTRICT NO. 1
RESOLUTION NO. SMD#1 - 4
SERIES 2019

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE SUPERIOR
METROPOLITAN DISTRICT NO.1 APPROVING THE ADOPTION OF
THE 2019 WATER CONSERVATION PLAN

WHEREAS, the Superior Metropolitan District No. 1 (SMD NO. 1) is a participant in the Windy Gap Firing Project, which involves the use of facilities owned and operated by the Bureau of Reclamation ("BUREC");

WHEREAS, the BUREC requires all participants in the Windy Gap Firing Project to have a Water Conservation Plan that has been approved by the Colorado Water Conservation Board;

WHEREAS, SMD NO. 1 also desires to maintain a Water Conservation Plan as a responsible water user;

WHEREAS, SMD NO. 1 has updated its 2011 Water Conservation Plan pursuant to C.R.S. § 37-60-126 and the associated guidelines issued by the Colorado Water Conservation Board; and

WHEREAS, C.R.S. § 37-60-126 and the associated guidelines issued by the Colorado Water Conservation Board require SMD NO. 1 to adopt the Water Conservation Plan prior to submittal to the Colorado Water Conservation Board for approval.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE SUPERIOR METROPOLITAN DISTRICT NO. 1, as follows:

Section 1. The Board of Directors adopts the 2019 Water Conservation Plan.

ADOPTED this 8th day of July, 2019.



Clint Folsom, President

ATTEST





Phillip L. Hasen, Secretary