



Steamboat Springs, Colorado Water Conservation Plan II

December, 2010



*Water Conservation Plan II
Mount Werner Water & City of Steamboat Springs*

The *Steamboat Springs, Colorado Water Conservation Plan II* has been developed through a partnership between the City of Steamboat Springs and the Mount Werner Water & Sanitation District.

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this project.**

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EXECUTIVE SUMMARY

Introduction

Water supply planners, engineers and operators worldwide agree that water conservation is a strategic and paramount component of a successful water provider's business model. This holds true, not only for sustainable use of the natural resource, but also in creating an efficient business model. There are numerous cost economies directly associated with the incorporation of a well thought out water conservation strategy including savings in energy and chemical treatment costs.

In 1991 the Colorado Water Conservation Act, C.R.S. §37-60-126, went into effect, creating the Office of Water Conservation and Drought Planning (OWCDP) and requiring entities that supply 2,000 acre-feet or more of water annually to develop, adopt, make publicly available, and implement a water conservation plan. Plans must be submitted to the Colorado Water Conservation Board (CWCB) which has developed guidelines that are required to be met prior to their approval.

While the City and MWW each fall below this 2,000 acre-foot threshold, together they supply 3,000 acre-feet to their combined constituencies through a shared water supply system. Accordingly, the two entities desire to be proactive and have committed to partner to meet the mandate. This joint water conservation plan is the result of that partnership.

This plan has been developed with the intent of formally adopting it by resolution of both the City Council and the Mount Werner Water District Board. It is comprised of two separate but inter-related components, a water conservation plan and a drought and emergency response plan.

Creation of this plan could not have taken place without the generous support and grant funds from the Colorado Water Conservation Board.

Why Water Conservation?

Water conservation is key to developing a sustainable community; it demonstrates responsible stewardship of our water resources and responsible management of our infrastructure and financial resources. By raising citizen awareness, a conservation program can also prepare the community to respond effectively to drought conditions or other water emergencies and to accept and adapt to progressively more stringent conservation measures.

Water is a precious and finite resource and Steamboat Springs is not immune to the need to embrace a water conservation ethic. The overarching goals of this Water Conservation Plan are:

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- To raise awareness of the need for and benefits of water conservation and help create a “conservation culture” in Steamboat Springs that protects our limited and essential water supply
- To foster the understanding that making wise water use choices directly correlates to future investment of public funds – saving water means saving money on mandatory water supply and wastewater plant expansions.
- To convey how every user and each water supplier can benefit from implementing a conservation ethic
- To prepare the community for responding effectively to a drought or other water emergency and prescribe a response plan.

Targets

Measuring the success of a water conservation culture in the Steamboat Springs community requires that targets be set and progress be monitored.

Water conservation goals for Peak Day Demand water usage are 5% reduction by 2015, 10% reduction by 2025 and 15% reduction by 2035 *and in addition* to these goals, set targets for non-revenue water as follows: from 19.9% to 12% for the City and from 12% to 8% for MWW.

Targets - REDUCE PRODUCED WATER 15% BY YEAR 2035

Water Conservation Program General Category		Approximate water savings using projected 2035 water production of 1.8 billion gallons
Indoor residential and commercial water savings through water efficient appliances/equipment & behavioral best practices	15% of the goal will be achieved through this category	40.5 million gallons
Irrigation and Landscaping Efficiencies	15% of the goal will be achieved through this category	40.5 million gallons
<u>Utility enhancements</u> (such as distribution system repair/replacement, leak detection, tiered rate structure, meter enhancements and monitoring, hydrant testing/monitoring, bill stuffers & newsletters, decorative water feature standards, park irrigation monitoring, and raw water conversion for irrigation). For details see sections 8 and 9 of the Water Conservation Plan	70% of the goal will be achieved through this category	189 million gallons

II.		
TOTAL GALLONS SAVED		270 million gallons

Water Supply and Use

Firm yield is an estimate of the amount of water available from the community’s raw water supply. The firm yield of the Fish Creek Basin is estimated to be 7,000 acre-feet (AF) of water (325,828.8 gallons per AF). The wellfields provide an additional 2,000 – 3,000 AF. If there were to be a disaster in the Fish Creek Basin that contaminated or depleted the water source, the wellfields alone could not support the population. To ensure the ability to continuously provide safe drinking water to the community, it is a priority to explore water supply opportunities in the Elk River Basin.

The current average annual water use in the Steamboat Springs service area is approximately 3,000 AF. In 2007 the community consumed over 1 billion gallons of potable water. Weather is usually the single biggest factor affecting daily use. Factors affecting long term use include resident population growth, resort development, and long-term water conservation efforts.

The Steamboat Water Supply Master Plan (WSMP), completed in November 2008, demonstrated that indoor demands account for roughly two-thirds of the total demand and outdoor irrigation water requirements account for roughly one-third of the total system demand. However, during the summer, outdoor irrigation use is double indoor use. In Table 2-16 of the WSMP, the average Maximum Day Demand for 2004-2007 was 550 gallons per resident per day (gpcd) overall. This number factors in usage in this resort town by not only permanent residents, but also tourists, commercial users, and the water utilities themselves in fire hydrant maintenance. To get an idea of average per person per day indoor water usage, City data for residential consumption only was used from April and May of 2006 and 2007. The result was 87 gpcd. Peak day demand per person, which occurs in the summer months, must factor in outdoor water use (e.g. irrigation).

Suggested Conservation Measures

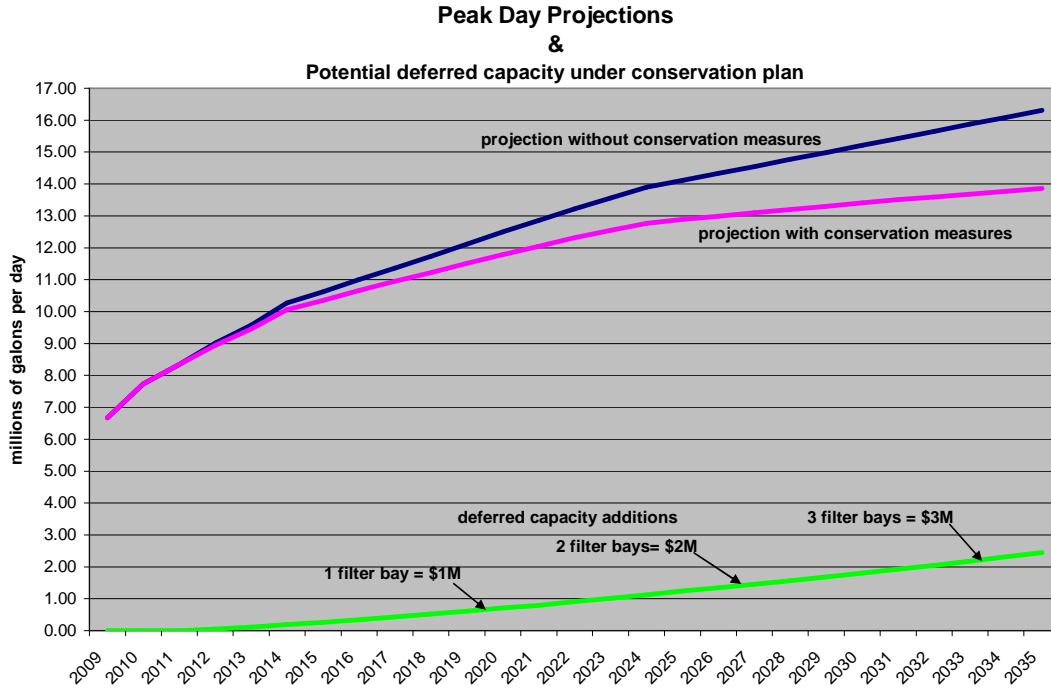
Education and technology enhancements would have a significant impact on reducing demand. Two-thirds of demand in the summer (June-September) is irrigation demand which is why focusing on improving irrigation practices in commercial and residential use is critical. In addition, behavioral changes in indoor use together with fixture and appliance retrofits (water efficient toilets, showerheads, dishwashing and clothes washing machines, etc.) could further reduce the gpcd by as much as 15%. A full itemization of recommended best practices and programs is provided in the water conservation plan.

Implementation Plan

A water conservation implementation plan is provided as part of this program as well as a drought and water emergency preparedness component. By implementing the program

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with the objective of meeting the proposed water reduction targets, benefits will be realized as shown in the following graph. The program has the potential of deferring \$3-4 million in capital expenditures over the next 25 years and reducing the rate of growth of operating costs.



Recommended Water Conservation Measures and Programs

It is realistic in the current economic climate to think that the following implementation program can be undertaken. It should be noted that rebate programs and certain other capital projects would only be feasible if grant funds are awarded. These programs are intended to be implemented within the planning period identified in this Plan.

Implementation Plan:

Continue existing programs including enhancements:

Item	Annual Water Savings	Current Program Cost	Funding Source
➤ Distribution system, infrastructural repair/replacement U2	1,244,625	\$613,000 annually	Capital Improvement Program (CIP) or Bond
➤ Tiered rate structure (City & MWW) U3	14,806,170	\$21,775 annually	Operation (O&M) Budget (built into rate structure)
➤ Meter enhancements/software (City & MWW) U4	14,747,000	\$326,287 3 years City 2 years MWW	O&M

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➤ Drought & emergency preparedness U16	0-60,200,000 (only implemented if drought)	\$4,275 variable	O&M
TOTAL	90,997,795		

Result: 9% savings of total water produced (if drought year stage 3), or 3% not factoring in the drought preparedness restrictions

2011 and Beyond:

Item	Annual Water Savings	Program Cost	Duration	Fund Source
➤ Website enhancements E1	49,354	\$1,552	Annually	O&M
➤ Bill stuffers U6	12,225,875	\$2,080	Annually	Grant
➤ Park irrigation monitoring (City) U11	1,097,810	\$3,125	Annually 5 parks/yr	O&M
➤ Raw water conversion for irrigation (City) U19	3,000,000	\$52,750	Annually over 5 years	Grant & O&M
➤ HOA and Lodging Property Program (MWW) E10	10,261,000	\$8,850	Annually	MWW O&M
➤ Appliance and/or irrigation component rebate programs R1-R4 with residential & commercial audits as necessitated	5,468,965	\$61,738*	355 rebates over 1 year	Grant
➤ Hydrant flushing quantification U5	0	\$2,220	Annually	O&M
➤ Meter testing U14	96,000	\$24,906	Annually	O&M
➤ Annual public education event E6	498,135	\$1,850	Annually	Grant
TOTALS	32,697,139			

*would require grant funds

Result: 3% savings of total water produced

Add one program per year starting in 2012 from list below

- Irrigation education E4
- Irrigation training E2

- Indoor and Outdoor residential audits A2&3
- Commercial education (partnering with Steamboat Sustainable Biz Program) E9

System Loss Reduction Goals

The estimated water loss for the City distribution system is 19.9% and MWW 12%. This water is categorized as non-revenue water and is due to distribution system leakage, metering inaccuracies, un-metered use and non-metered park irrigation. These losses would be addressed by implementing utility-initiated programs detailed in this plan (see explanations for U1, U2, U4, U14, U11 and U19). Currently, approximately 156 million gallons per year (MG/Yr), or 16% of produced water on average for the City and MWW, is lost from the system. A target has been set to reduce this loss by 58 million gallons to 98 MG/yr by the year 2035.

Drought and Water Emergency Preparedness

Colorado experiences a wide range of climatic conditions causing periodic droughts. In addition to a prolonged drought, water supply systems are also at risk from uncertainties such as forest fires, failure of dams, water mains, wells, and contamination of all or part of the raw water supply.

In emergency or drought situations, contingency plans are needed to minimize impact to residents, the economy and the environment. These plans should include the implementation of mandatory measures with flexibility built in to respond to changing conditions.

Adoption by the City Council and MWW District Board of the three-stage response plan outlined below is recommended. Adoption of this plan will authorize the Director of Public Works of the City and the General Manager of MWWD to declare Stage 2 and Stage 3 conditions and implement and enforce the drought response actions. Stage 1 will be in effect at all times.

Stage 1: The following recommended guidelines are in place at all times

- Potable water shall be used for beneficial purposes and should not be wasted.
- No outdoor watering 10AM – 6PM.
- When irrigating with a hose, use spring-loaded nozzle; no free-running hoses.
- Discourage tree-planting and the seeding or sodding of new lawns June 15th through August 31st.
- Encourage the use of native grasses and shrubs and drought-tolerant species on new or re-developing properties.
- Discourage water-intensive landscapes.
- Limit the filling of swimming pools to one per year, unless draining for repairs is necessary.

Stage 2: This stage will be triggered by a drought warning based upon:

- April 1st SWE at the Tower SNOTEL site below 80% of average;
- an early run-off (before July 1) resulting in low flows in the Fish Creek Watershed;
- persistent higher than average temperatures in April through August;
- below average precipitation in April through August.

The following Stage 2 restrictions will be put into effect by Utility operators and will be mandatory in addition to the year-round recommendations in Stage 1:

- Watering schedule based on the last number of customer street address:

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Even	Odd	Even	No Watering	Odd	Even	Odd

- Permits may be secured for newly-sodded lawns and newly-planted trees for up to 14 consecutive days and for newly-seeded lawns for up to 25 consecutive days with the exception of Wednesdays.
- No vehicle washing at residences.
- No washing hard surfaces (i.e., driveways, sidewalks, parking lots, outdoor eating areas).
- No running outdoor water features (including those meeting MWW District specifications).
- No use of domestic water for dust control.

Stage 3: This stage will be triggered by a drought declaration or a water supply emergency caused by forest fire or failed infrastructure.

The following mandatory restrictions go into effect in addition to Stage 1, Stage 2 restrictions as determined by the Utility operator:

- No lawn irrigation.
- Suspension of special watering permits including those for newly seeded or sodded lawns.
- Hand watering of trees, shrubs, and flowers, and drip irrigation of trees and shrubs is allowed.
- All businesses including hotels, restaurants and property management companies, will be required to implement Stage 3 water conservation measures including education of owners, tenants and guests.

Public Outreach

Effective development and implementation of this community conservation program and associated Implementation Plan requires the effort of everyone associated with water suppliers and local governments. Water suppliers and local governments must engage

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residents, business owners and other users in an exchange of views and ideas as well as raise awareness on the need to conserve and preserve our precious resource.

In April of 2009, the first Water Conservation Plan for the Steamboat Springs community, including the City and MWW was finalized. Both the City Council and the MWW Board embraced the Plan. In May of 2010, this Plan, Water Conservation Plan II, with the generous funding assistance provided by the CWCB, was embarked upon with the intention of gaining CWCB Plan approval and subsequent implementation assistance.

Conclusion

This plan is intended to be a living document which will be revisited periodically. The CWCB requires adopted plans to be updated a minimum of every 7 years. Progress reports relative to program costs, successes and challenges will be prepared annually.

1.0 INTRODUCTION

1.1 Why Water Conservation?

Water is a precious and finite resource and Steamboat Springs is not immune to the need to embrace a water conservation ethic. The City of Steamboat Springs is located in the Yampa Valley on the western slope of Colorado which is a semi-arid climate, averaging 24 inches of moisture per year. Just as a person with limited financial resources must live within his or her means, similarly, limited raw water resources and treatment facilities dictate the need to live within certain limits related to both natural resource carrying capacity and the built infrastructure.

The overarching goals of this Water Conservation Plan are:

- To raise awareness in our community of the need for and benefits of water conservation and help create a “conservation culture” that protects our limited water supply
- To convey how every user and each water supplier can benefit from implementing a conservation ethic
- To foster the understanding that making wise choices in using water directly correlates to future investment of public funds – saving water means saving money
- To prepare the community for responding effectively to a drought or other water emergency and prescribe a response plan.

Metrics

Measuring the success of a water conservation culture in the Steamboat Springs community requires that targets be set and progress be monitored.

Currently, Mount Werner Water District (MWW) is in the process of installing water meters that incorporate radio transponders to relay water usage twice daily to a data base. These meters are being phased-in on a four-year plan. Information derived from this technology, in combination with available software that allows query, tracking and reporting, will become the basis of a more accurate monitoring of water usage.

Ideally, by interpolating a more detailed set of single family household usage data and/or per capita usage data by season, more specific goals can be set and progress communicated. The Steamboat Water Supply Master Plan (WSMP), completed in November 2008, demonstrated that indoor demands account for roughly two-thirds of the total demand and outdoor irrigation water requirements account for roughly one-third of the total system demand. However, during the summer, outdoor irrigation use is double indoor use. In Table 2-16 of the WSMP, Maximum Day Demand for 2004-2007 was 550

gallons per person per day (gpcd) overall. This number factors in usage by all sectors including tourism-based population, commercial uses, and fire hydrant flushing.

To get an idea of average per person per day indoor water usage, City data for residential consumption only was examined from April and May of 2006 and 2007. The result was 87 gpcd. Peak day demand per person, which occurs in the summer months, must factor in outdoor water use (e.g. irrigation).

Recommended Approach for Establishing Targets and Metrics

This Plan recommends using summer Peak Day Demand by person per day (gpcd) as the best way to relate water conservation targets to the general public. This number is currently calculated at 550 gpcd when you factor in all users including full time residents, commercial users, tourism-related demands, and fire hydrant flushing.

Two-thirds of this demand in the summer (May-September) is irrigation demand. Education and technology enhancements can have a significant impact on reducing irrigation demand. Behavioral changes in indoor use together with fixture and appliance retrofits (water efficient toilets, showerheads, dishwashing and clothes washing machines, etc.) could further reduce the gpcd by as much as 15%.

Non-revenue water loss through infrastructural system leaks will also be addressed more aggressively by MWW and the City through improved monitoring.

1.2 Goals and Targets

In the April 2009 Water Conservation Plan, targets for reducing Gallons per Capita per Day during Peak Demand (gpcd) for 5, 10 and 20 year intervals were established cumulatively and respectively at 10% by 2015, 15% by 2020 and 20% 2030.

Based upon recent research, the studies of the actual performance of implementing water conservation programs and measures in a number of water districts nation-wide has resulted in less water savings than preliminary projected. Accordingly, revised recommended water conservation targets for Peak Day Demand water usage are 5% reduction by 2015, 10% reduction by 2025 and 15% reduction by 2035 **and in addition** to these goals, targets for reducing infrastructure loss are set as follows: from 19.9% to 12% loss for the City and from 12% to 8% loss for MWW.

TABLE 1.1 TARGETS - REDUCE PRODUCED WATER 15% BY YEAR 2035

Water Conservation Program General Category		Approximate water savings using projected 2035 water production of 1.8 billion gallons
Indoor residential and commercial water savings through water efficient appliances/equipment & behavioral best practices	15% of the goal will be achieved through this category	40.5 million gallons
Irrigation and Landscaping Efficiencies	15% of the goal will be achieved through this category	40.5 million gallons
Utility enhancements(such as distribution system repair/replacement, leak detection, tiered rate structure, meter enhancements and monitoring, hydrant testing/monitoring, bill stuffers & newsletters, decorative water feature standards, park irrigation monitoring, and raw water conversion for irrigation). For details see sections 8 and 9.	70% of the goal will be achieved through this category	189 million gallons
TOTAL GALLONS SAVED		270 million gallons

1.3 Benefits of Water Conservation

Residents of Steamboat Springs use domestic water which has been filtered to EPA drinking water specifications for indoor domestic uses year-round as well as for discretionary outdoor uses in the summer months such as lawn irrigation and car washing. In the summer, use of potable water triples due to outdoor discretionary uses, predominantly lawn and shrub watering. It is principally for these discretionary uses that raw water must be shepherded and infrastructure such as additional filter bays must be constructed and maintained to meet peak-day water demands. Constructing and maintaining additional storage, treatment and distribution infrastructure costs public dollars. Conservation, therefore, can slow the rate at which additional public dollars must be invested in new water supply and treatment facilities.

Figure 1.2 Projected Water Savings with Water Conservation

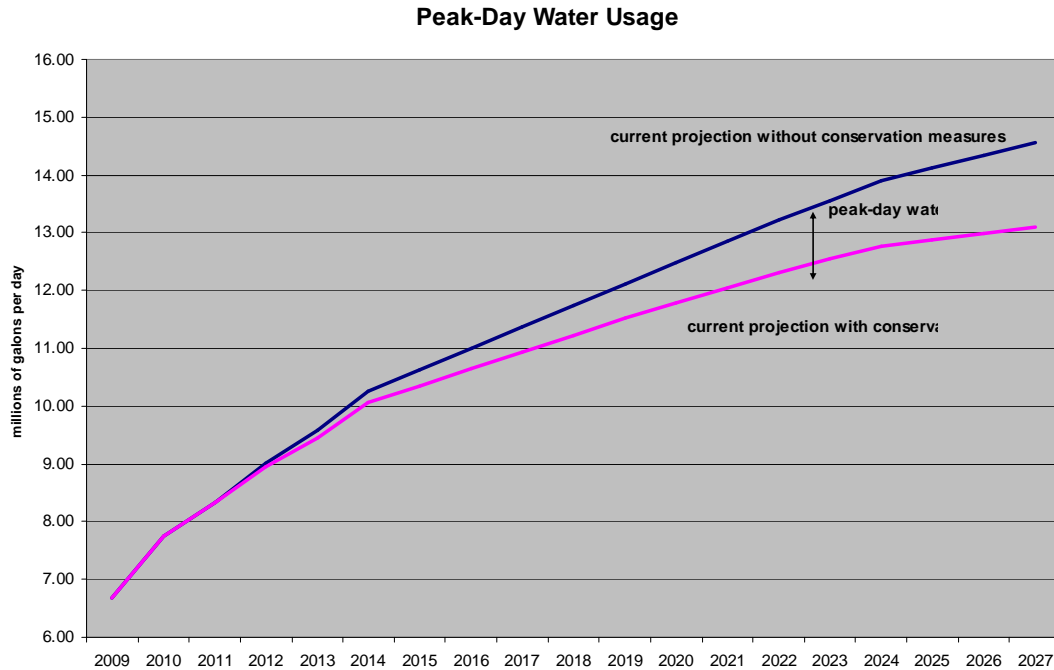
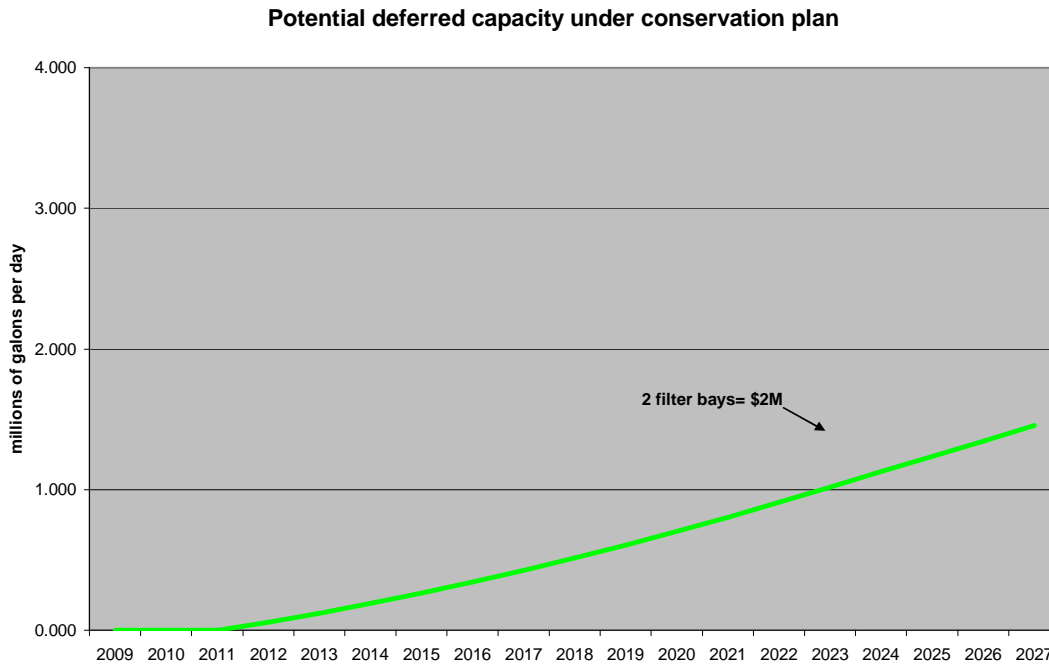


Figure 1.2 shows projected peak demand residential water use in million gallons per day by year without water conservation (blue line) compared to water use with water conservation (red line) at targets outlined above.

If the residents and commercial users in Steamboat Springs could shave peak-day demand by 10%, this reduction would be the equivalent of the daily capacity of one filtration bay, which costs District and City customers \$750,000 - \$1 million in current dollars to construct. Therefore, for every gallon not used on a hot summer day, we could postpone investing a dollar toward a new filtration bay.

Figure 1.3 Potential Deferred Treatment Additions Through Water Conservation Plan



Water conservation is a key strategy in developing a sustainable community; it demonstrates responsible stewardship of our water resources and responsible management of our infrastructure and financial resources. By raising citizen awareness, a conservation plan can also prepare the community to respond effectively to drought conditions or other water emergencies and to accept and adapt to progressively more stringent conservation measures.

1.4 Resource Management

The primary focus of an ongoing water conservation program and plan is to reduce or eliminate waste and increase efficiency in how water is used community-wide. This program does not propose measures designed to eliminate beneficial uses of water or to cause deprivation. Rather, this program is intended to provide the framework for efficient management of a valuable and limited resource in order to insure the long-term adequacy and reliability of our water supply.

Water conservation is an important component of overall water supply master planning. Actions to reduce water demand, reduce system losses, and increase operating efficiencies will result in benefits to the community.

Conservation planners generally believe that a long-term conservation program can reduce water consumption by 10 to 20 percent over a 10 to 20 year period.¹ Conservation

in this range can be economically justified by delaying capital investment in facilities which would otherwise be required without such a program.

1.4.1 Cost Benefits

Proven water conservation benefits are provided below.

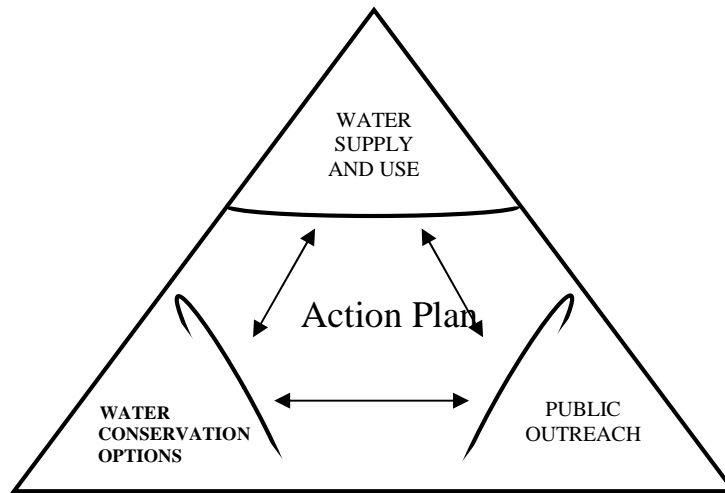
1. Direct operating and maintenance costs of water treatment and distribution, such as pumping (electrical) and chemical costs, are directly proportional to water demand. Reductions in water use, particularly on peak-demand days of summer, can reduce electric power and chemical feed costs.
2. Conservation measures can decrease the growth rate of long-term water needs and push out the timetable for investment in new water supply and treatment facilities.
3. Reductions in peak-day water demands and a decrease in the long-term growth rate of water demand would also relieve the loading of our wastewater treatment plant, reduce the rate of growth of operating and maintenance costs, and push out the timetable for investment in the expansion of the wastewater facility.
4. Customers will see direct cost savings by reducing their water use and subsequently their water bills.

1.4.2 Environmental Benefits

1. A lower rate of growth in long-term water demand means that more water remains in the reservoirs, the Fish Creek tributaries, and the Yampa River in addition to the decreed minimum CWCB flows to support a healthy aquatic environment. More water will also remain in groundwater aquifers.
2. Water conservation provides benefits related to future needs and upgrades for the wastewater treatment facility.
3. Using less water results in less energy consumption thereby reducing the carbon footprint of the community.
4. Conservation and efficiency in the use of a limited natural resource reflects our community's commitment to environmental awareness and responsibility.

1. Maddaus, W.O., *Realizing the Benefits from Water Conservation*, Maddaus Water Management, Alamo, CA

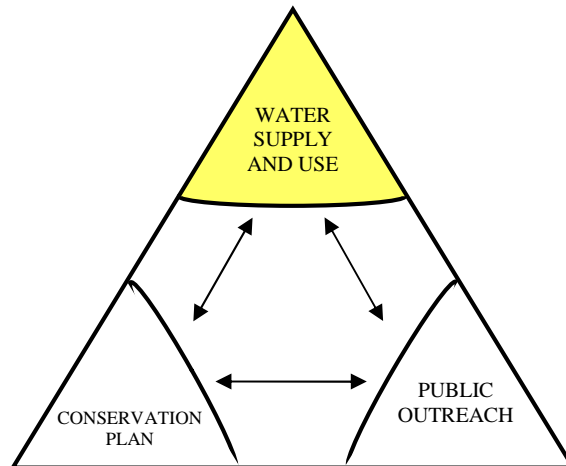
1.5 Developing a Comprehensive Water Conservation Plan



A good water conservation program focuses on four key activities: developing and sharing knowledge about our community’s water supply and use history and trends; developing a complete inventory of water conservation options; preparing a well-thought-out action plan that addresses needs during normal and drought conditions; and listening and communicating this information to residents, businesses and other users. These components are interrelated.

2.0 WATER SYSTEM PROFILE – UNDERSTANDING THE RESOURCE

2.1 Water Sources and Influences



The primary source of raw water in Steamboat Springs is the 22 square mile Fish Creek Basin, located east of the city. Supplies are in the form of in-stream flows and storage

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impoundments at Fish Creek Reservoir and Long Lake. The firm yield of Fish Creek Basin is 7000 acre feet (AF). The Fish Creek Filtration Plant filters this raw water to EPA drinking standards before it is distributed to the community. Infiltration galleries constructed in the alluvium of the Yampa River supply 20% of potable water during the summer. According to the Steamboat Water Supply Master Plan, the combined reliable yield of the well system based on the minimum annual supply result is about 2,000 – 3,000 acre-feet per year.

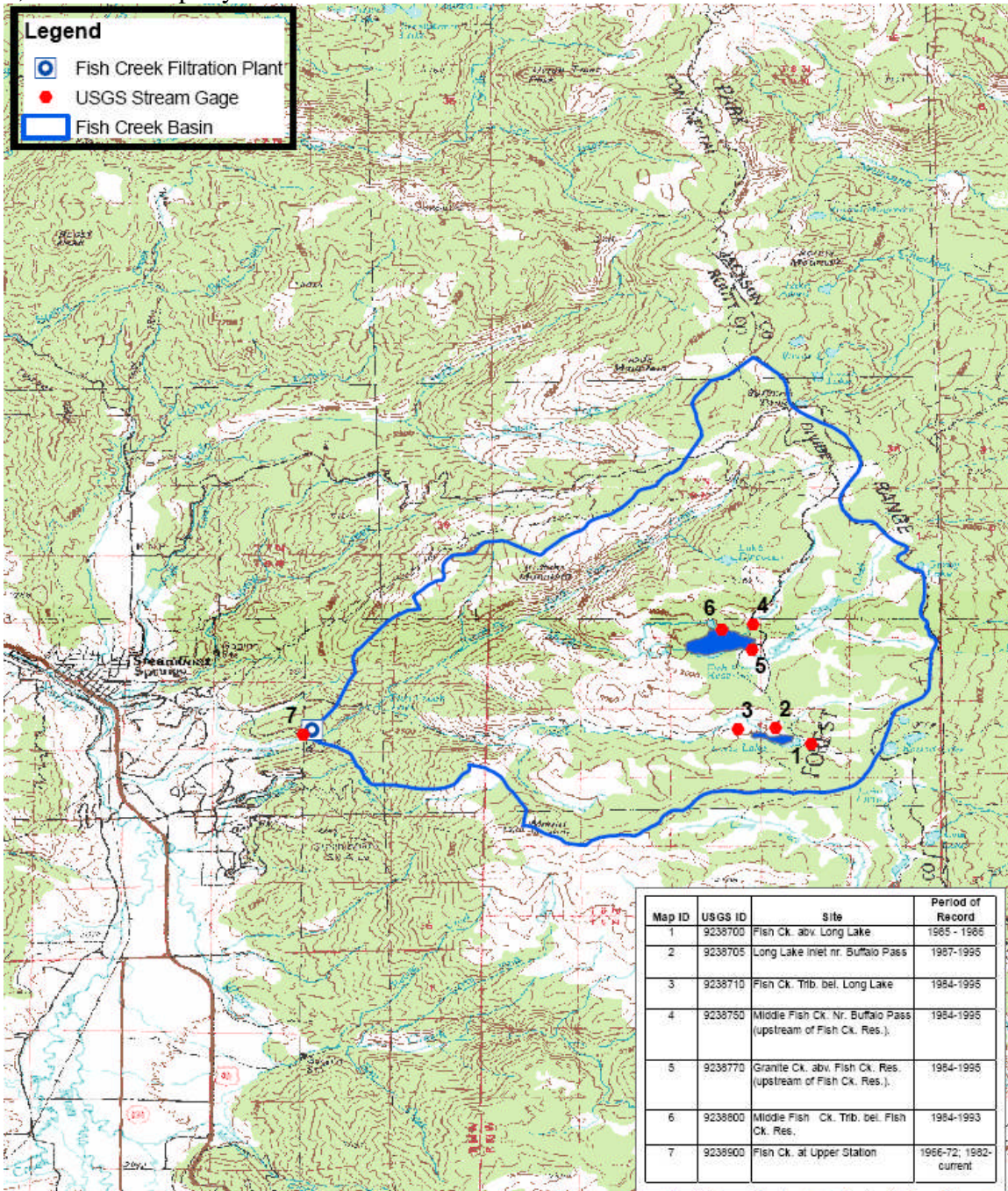


Figure 2.1 Fish Creek Drainage Basin Map from Steamboat Water Supply Master Plan Nov. 2008

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The City and MWW District service areas are shown in the map below:

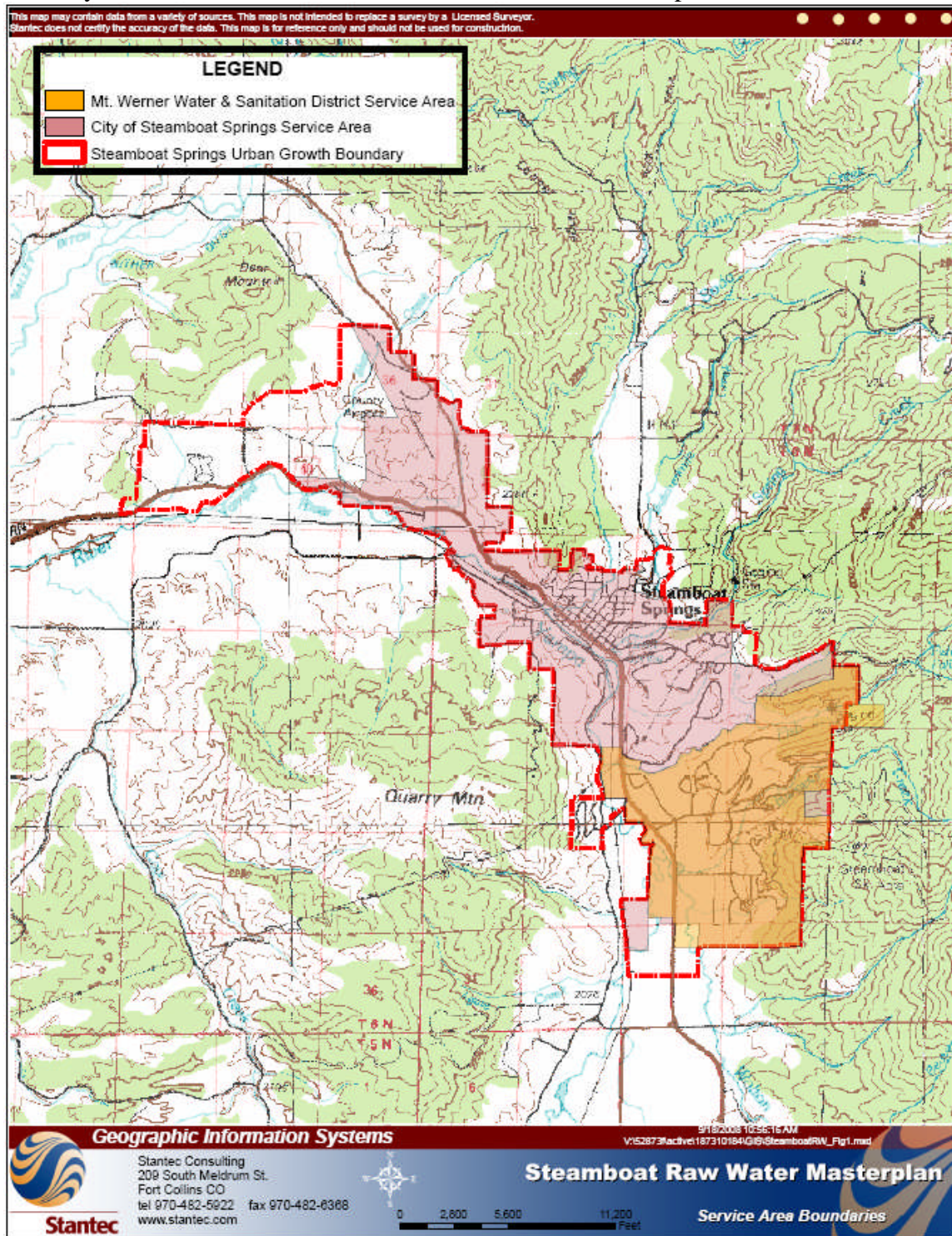


Figure 2.2 Water Supply Service Area Map from Steamboat Water Supply Master Plan, Nov. 2008

The service area is approximately 10 sq. mi., with 6 sq. mi. serviced by the City and 4 sq.mi. serviced by the MWW District.

Climate

Annual precipitation in the Steamboat Springs area ranges from 47 inches on Rabbit Ears Pass to 58 inches on Buffalo Pass, but it is the climate and weather of the valley floor that drives our personal water use decisions. This semi-arid climate averages 24 inches of moisture per year. Precipitation varies greatly in the valley month-to-month and year-to-year as shown in the figures below.

Figure 2.3 Cumulative Precipitation

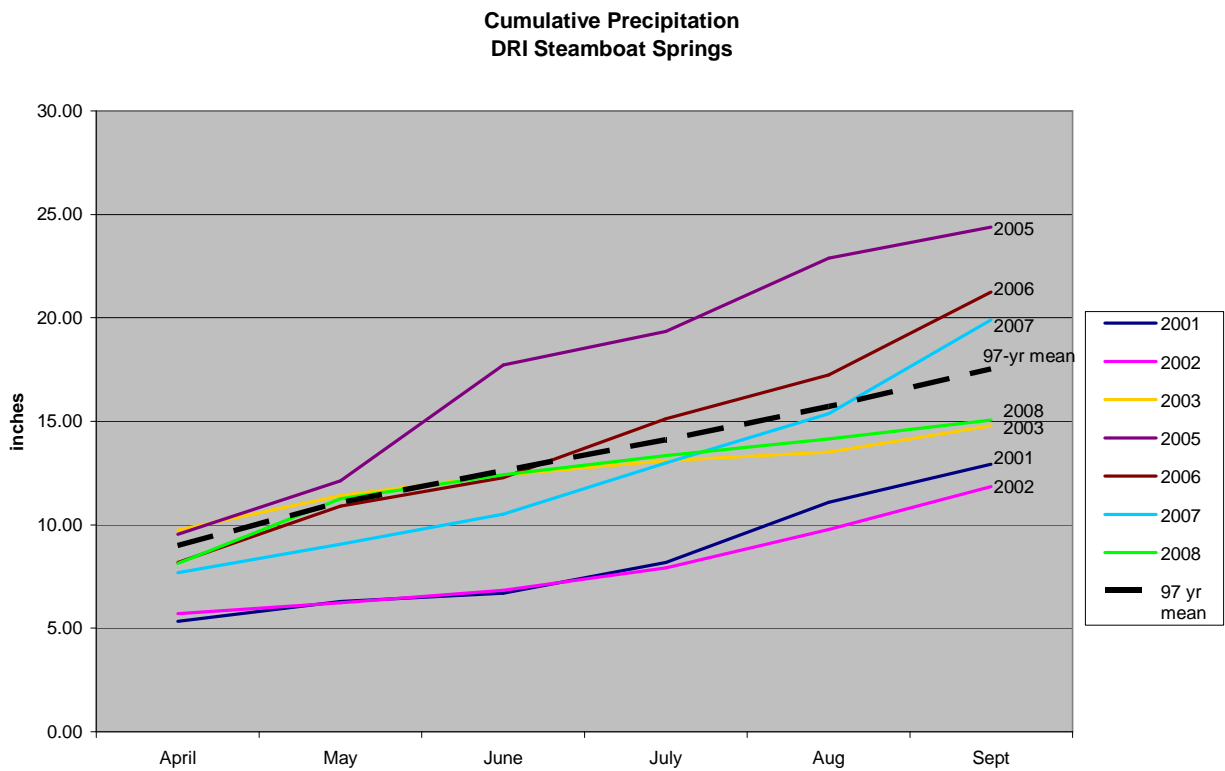
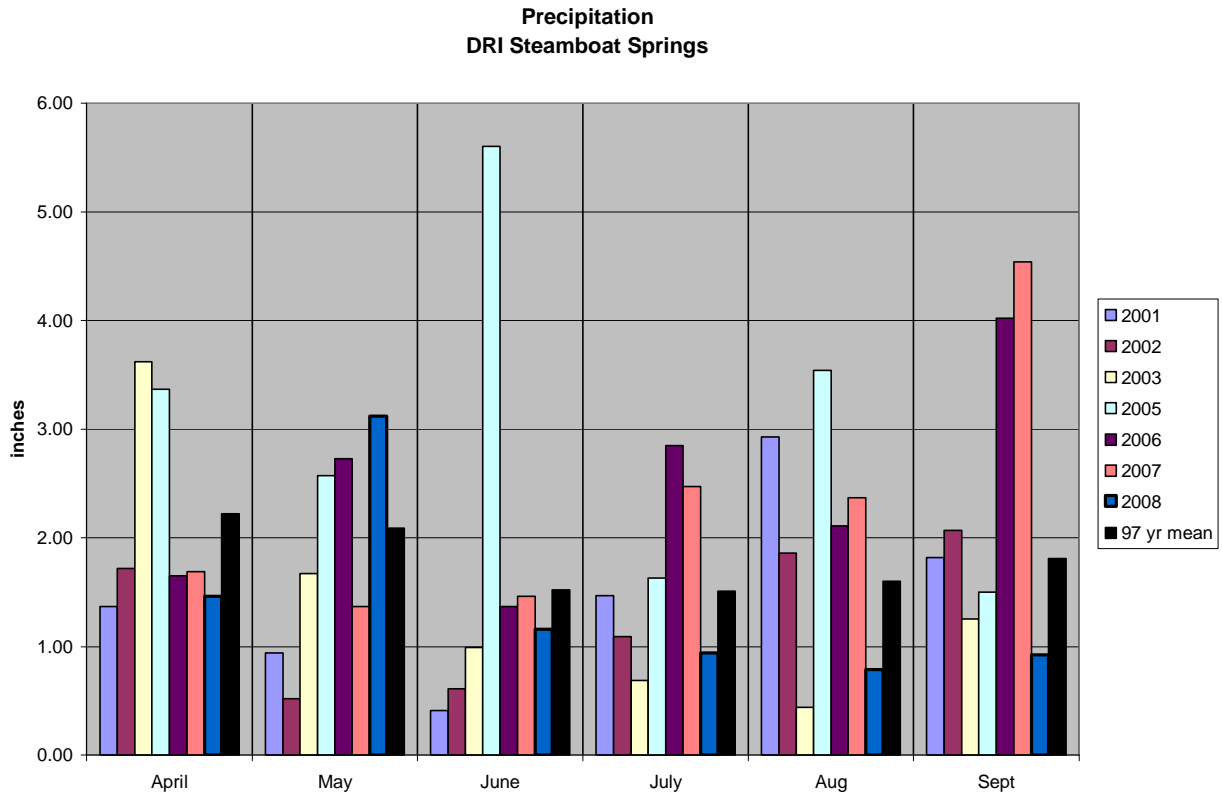


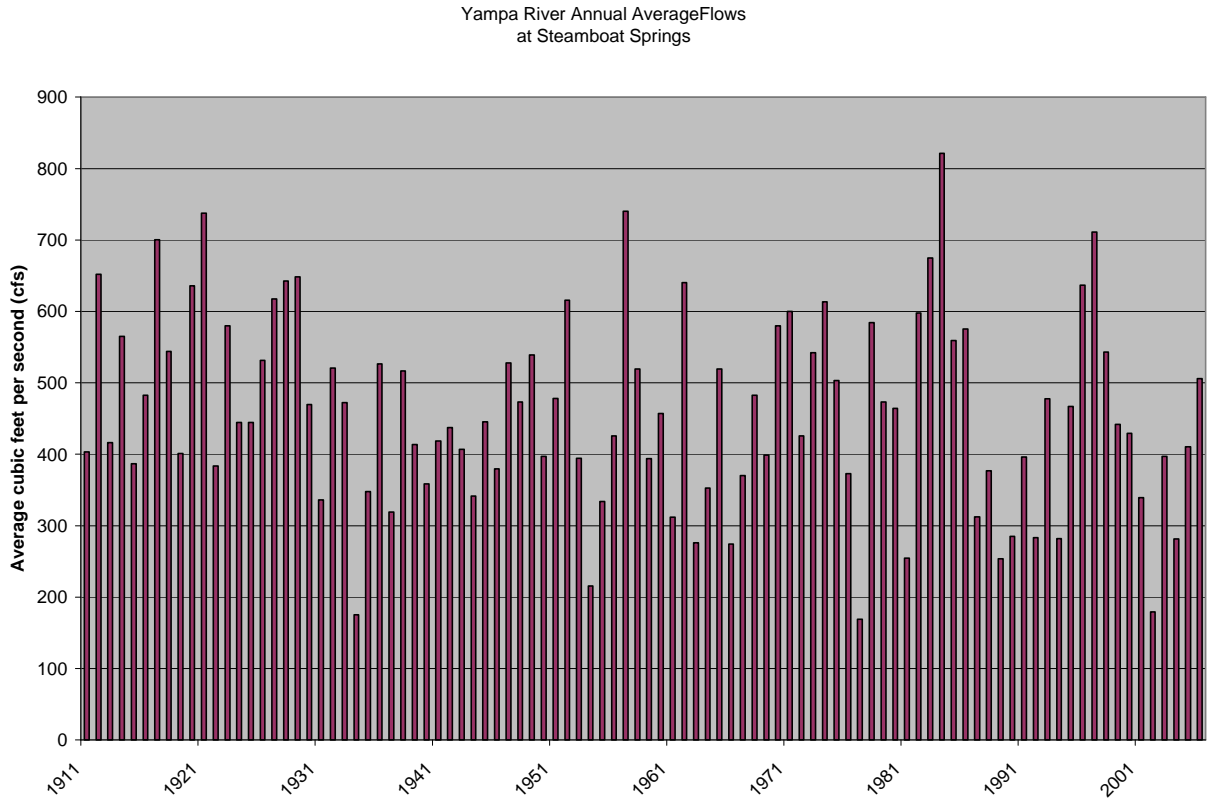
Figure 2.4 Steamboat Springs Precipitation



2.2 Raw Water Supply & Storage

Flow statistics for Fish Creek are only available for the period 1967-2007. However, nearly 100 years of flow records for the Yampa River are available. This bar chart illustrates the annual variability of riparian flows in the Yampa Valley during the past century. Since 1911, Yampa River annual flows have averaged 458 cfs. During that time, there have been four years when river flows fell below 50% of average: 1934, 1954, 1981, and 2002. Upriver dam construction has also caused some fluctuations.

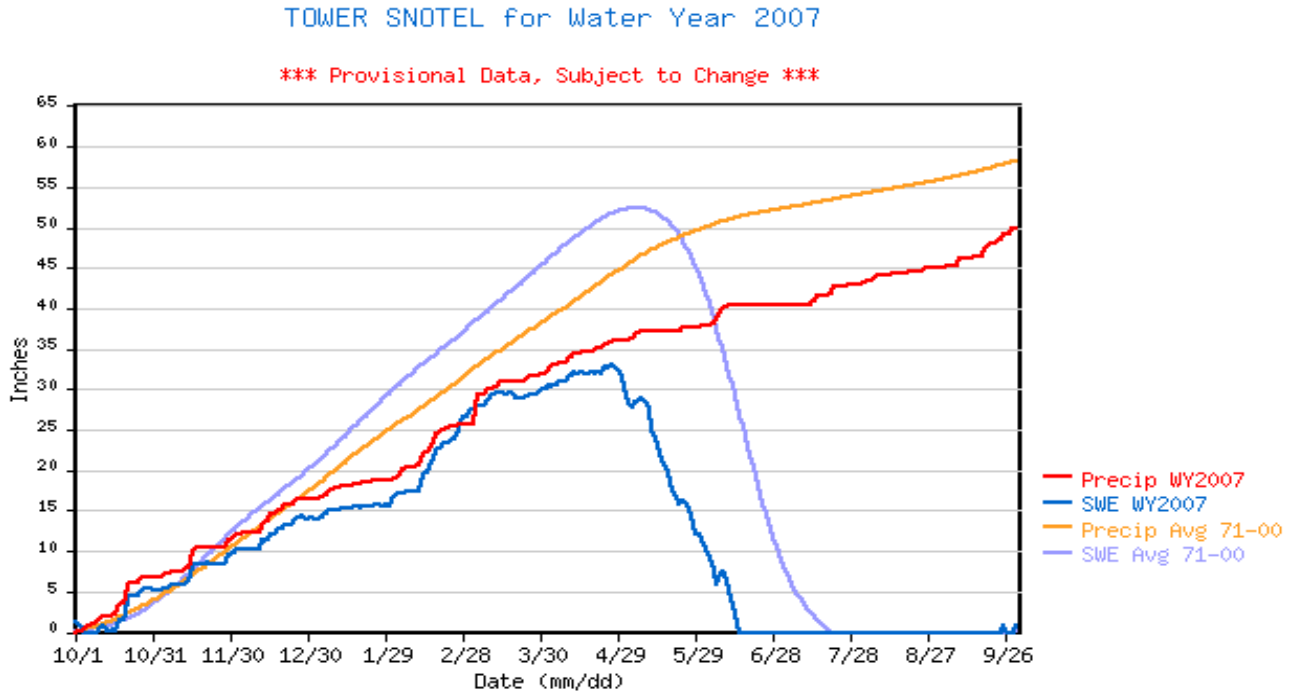
Figure 2.5 Yampa River Flow



Water is stored in two physical phases: solid snow and liquid water. The snowpack on Buffalo Pass at the headwaters of Fish Creek constitutes our seasonal reserve which, melting slowly, supplies water for our in-stream flows and for storage in our two reservoirs, Fish Creek Reservoir and Long Lake. Cool temperatures at altitude typically conserve the snowpack into late-June allowing run-off to continue into mid-July and well into our irrigation season in the valley below.

The NRCS Tower SNOTEL site records for WY2007 show below average precipitation and SWE (the water content of the winter snowpack) through the winter of 2006-2007. The WY2007 patterns followed those of the WY2002 drought year very closely. A below average April 1 SWE of 30.8 inches, followed by below-average precipitation and above normal temperatures in April, May, and June ensured an early disappearance of the snowpack and an early runoff in the Fish Creek drainage basin.

Figure 2.6 2007 Snotel Data



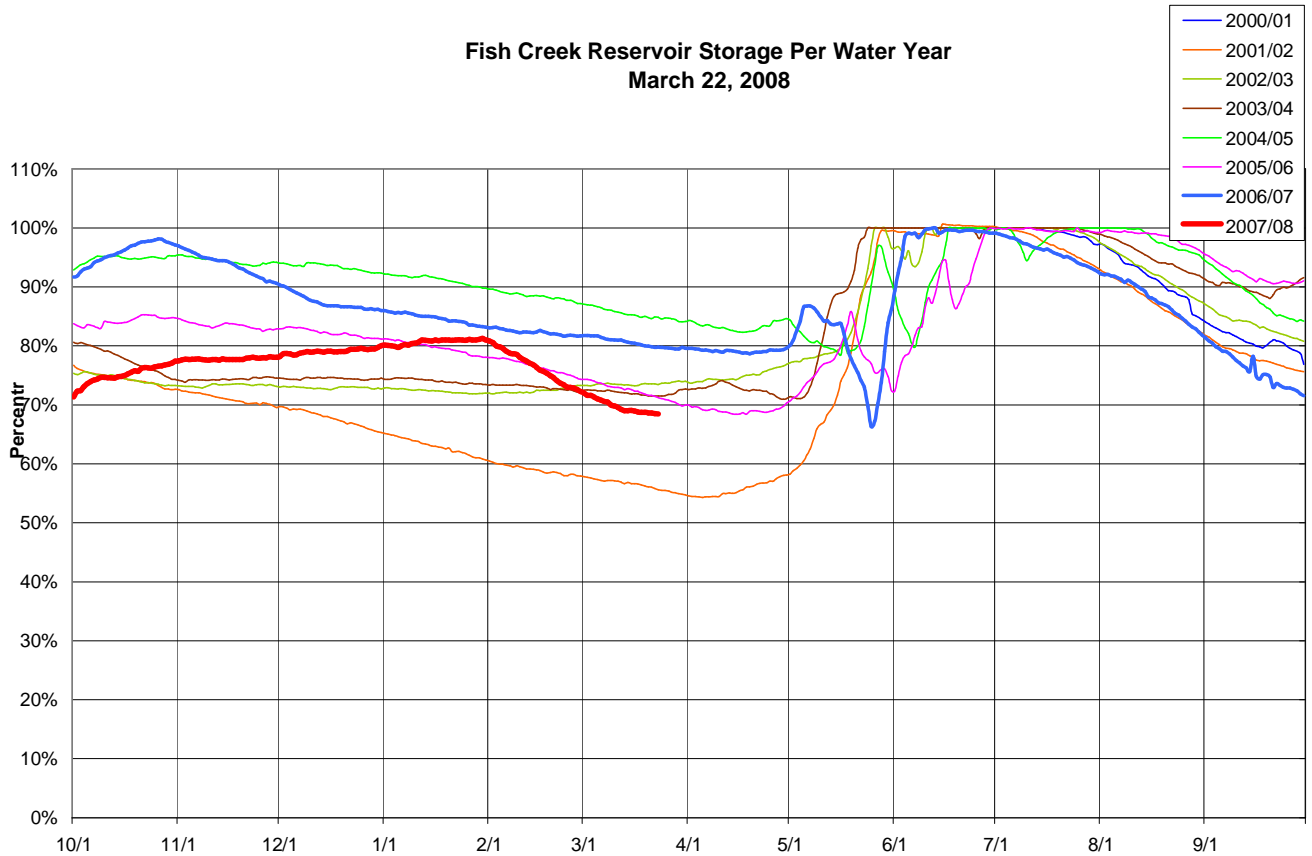
2.3 Storage Rights

The City and the District each have water storage rights in Fish Creek Reservoir as follows:

Original Capacity	1,842 AF owned by the City
Enlargement Capacity	2,280 AF owned 72% by the District, 28% by the City
Possible storage up to	2,325

Note: The Department of Wildlife has certain contract rights to maintain a fisheries pool in the reservoir as enlarged, and the CWCB has certain rights to use 200 AF of water stored in the enlargement capacity for release to augment in-stream flow decrees on Fish Creek if the City elects to store such 200 AF out of its reservoir share for such purposes. The City percentage assumes full exercise by the City of its options to buy into the enlargement capacity.

Figure 2.7 Fish Creek Reservoir Storage

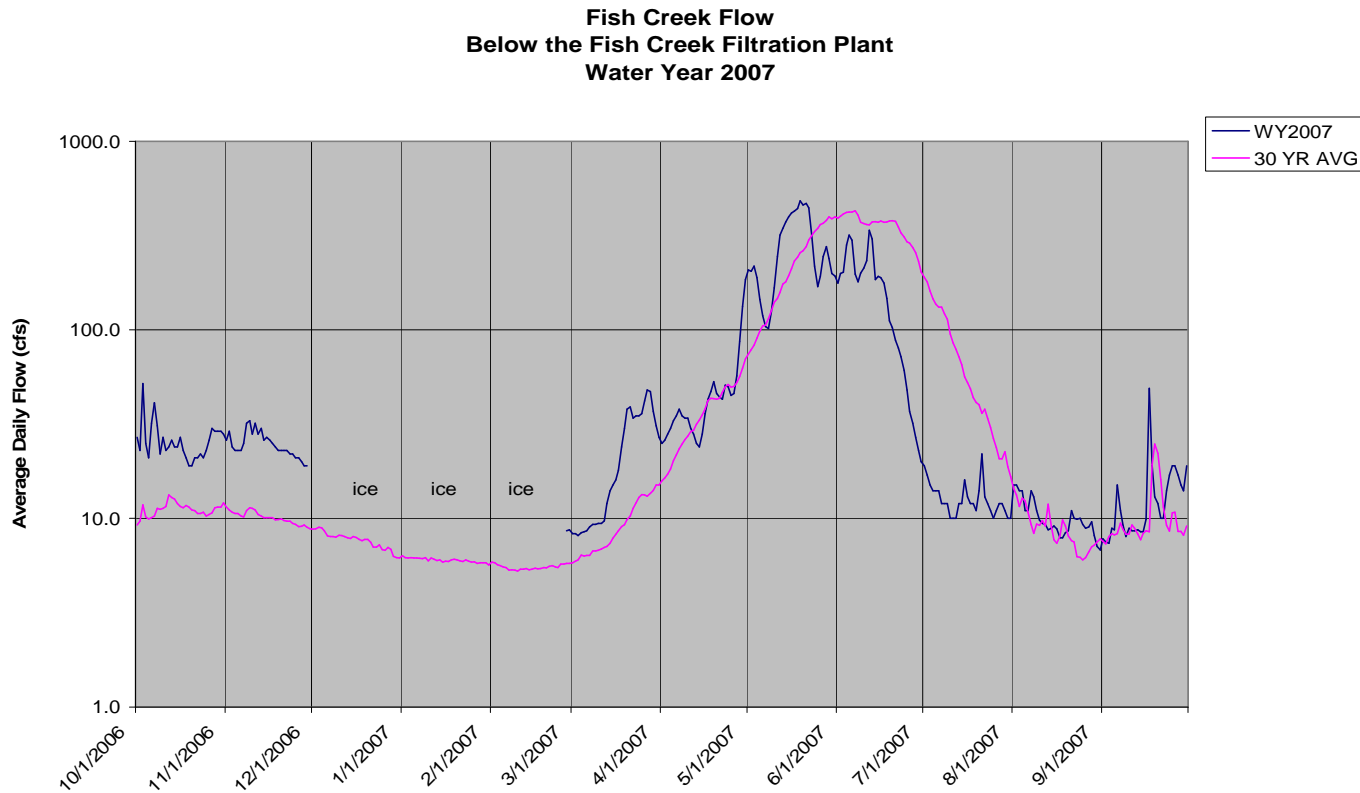


2.4 In-stream Water Rights

The graph below illustrates the variability of flow through the year for Fish Creek. This graph shows how the 2007 spring runoff occurred a month earlier than the 30-year average due to below normal precipitation in April, May, and June and above average temperatures. Flows at the Fish Creek Gaging Station, located immediately downstream of the Fish Creek Filtration Plant, are affected by reservoir releases, by diversions to the Fish Creek Filtration Plant, and by minor transit losses from evapo-transpiration.

The City and the District own the most senior in-stream water right on Fish Creek, the Hoyle & Knight Ditch 8.3 cfs (1889). The District holds 5.8 cfs and the City 2.5 cfs of this water right.

Figure 2.8 Fish Creek Flow



3.0 SITUATIONAL ANALYSIS

3.1 History

The City of Steamboat Springs dates back to when permanent settlers came to the region in the late 1800’s. Until then, the Ute Indians had seasonally inhabited the Yampa Valley. The development of water and sewer infrastructure began in 1903 making the oldest mains up to 107 years old. The “old town” was square shaped bounded by 13th Street to the West and 1st Street to the East, Deer Foot and Laurel Streets forming the north border and Yampa Street the southern boundary. During the next several decades other smaller areas of the valley began supplying water to individual homes. Three water districts were created, Fish Creek District, West Steamboat District and Riverside District. By the mid-1990’s the town of Steamboat Springs absorbed these independent systems, consolidating them into the town’s water supply network. In 1988 there is record of 78 miles of combined sewer, water, and storm mains. In 2009 the infrastructure totaled 123 miles of sewer, water, and storm mains. According, 37% of the current system was built between 1988 and 2009 and is less than 22 years of age. The remaining 63% of the City infrastructure is between 22 and 107 years of age.

In 1960 Storm Mountain (later named Mt. Werner), which is located three miles south of old city limits, was developed into a ski resort. A separate water and wastewater distribution system, the Mount Werner Water and Sanitation District (MWW) was created in 1965 to service this new development. The mountain area was annexed into the City limits in 1972 but has remained a separate water and sewer district. That infrastructure is less than 45 years old.

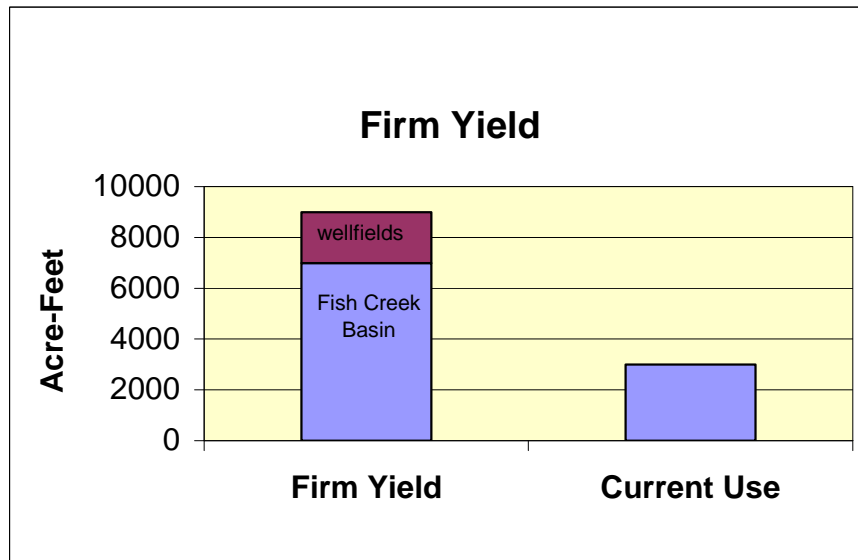
Steamboat II Metropolitan District (SIIMD) is outside city limits. The SIIMD currently purchases 4.5 million gallons/month of water from the City of Steamboat Springs. It serves the Steamboat II, Heritage Park and Silver Spur neighborhoods. The Steamboat II development was originally built in the late 1970s making the SIIMD infrastructure around 40 years old. The SIIMD also has one supplemental wellfield comprised of three shallow wells which are used for irrigation and backup. This water does not undergo treatment other than chlorination. SIIMD owns senior water rights to 100 AF from the Yamcolo Reservoir at the headwaters of the Yampa River.

3.2 Firm Yield

Firm yield is the dependable amount of water available from the raw water supply. Firm yield focuses on historic periods of low precipitation and stream flow to estimate the reliable yield of the raw water resource under existing water rights.

Firm yield is an estimate rather than an exact calculation. Of the many factors, weather is perhaps the most inexact aspect of firm yield estimates. However, it is possible that the Steamboat area could experience a drought more severe than has ever been recorded, and it could stress the water supply system even more than was accounted for in the firm yield estimates.

Figure 3.1 Firm Yield and Current Water Use



The firm yield of Steamboat's water system is estimated at 9,000 AF per year including 7,000 for Fish Creek Basin and 2,000 AF for the Yampa wellfields. While it appears that this is ample water to meet our current and future needs, most of the water available in the Fish Creek Basin runs off by mid-July and, for the following ten months, the community must live on the most senior in-stream flow rights and the water stored in the two reservoirs. To meet redundancy requirements, obtaining additional water from the Elk River Basin is being discussed.

An AF is approximately 326,000 gallons of water - an amount that would cover one acre of land to a depth of one foot, or a soccer field to a depth of 10 inches. This amount of water serves the needs of about four people in a year at their homes (or 1.7 homes with 2.35 people per household) and their offices, parks recreation centers, shopping centers, etc.

3.3 Produced Water

The City and MWW share two sources of treated water supply, the Fish Creek Filtration Plant (7.5 MGD capacity) and the Yampa River Infiltration Galleries/Filtration Plant (1.8 MGD capacity). The Fish Creek plant was constructed in 1971, and expanded in 1983, 2000 and 2007. It uses conventional filtration, and currently has ten filter bays with a capacity of 7.5 MGD. The existing raw water supply and chemical feed systems have an ultimate plant capacity of approximately 12 MGD. The Fish Creek plant is in good condition and is well maintained and has potential to add another six filter bays to increase capacity from 7.5 MGD to 12 MGD. The Yampa Wellfield System can be expanded to increase treated water capacity from 1.8 MGD to 3.3 MGD. If there were to be a disaster in the Fish Creek Basin that contaminated or depleted the water source, the wellfields alone could not support the population. To ensure the ability to continuously provide safe drinking water to the community, it is a priority to explore water supply opportunities in the Elk River Basin.

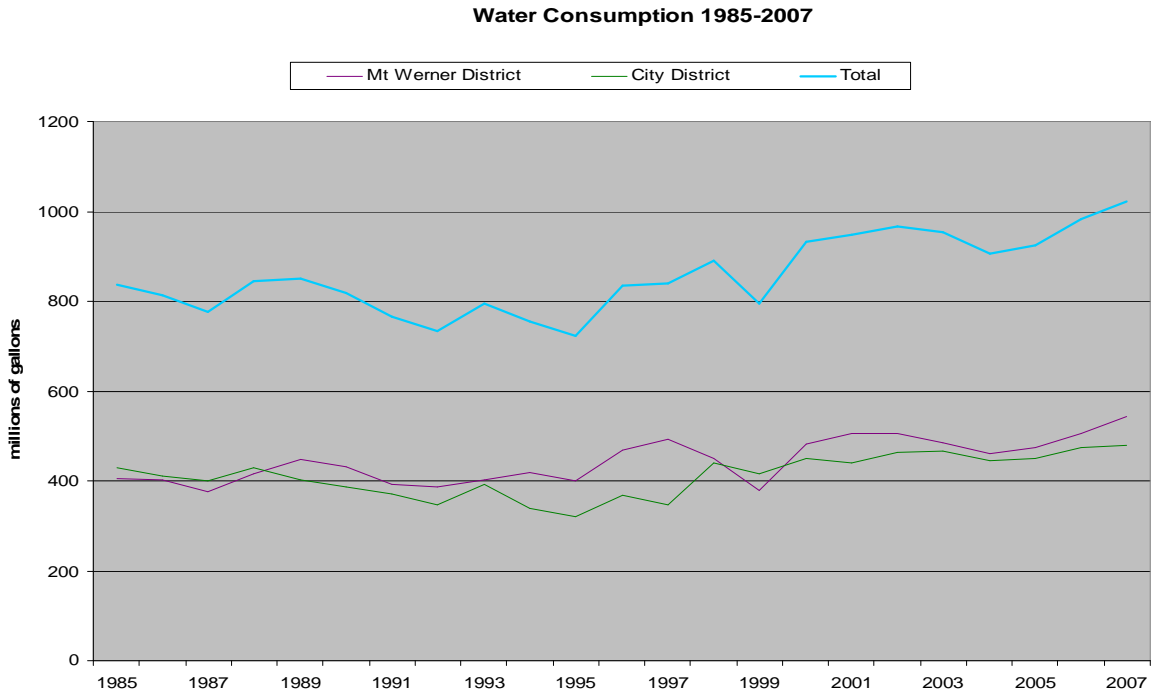
For the purpose of this Plan, actual data for water produced monthly during 2006 through 2009 was utilized to estimate produced water. On average, 1.8 MGD (million gallons per day) was produced during winter months and 4.3 MGD was produced during summer months (June – September). The current annual total produced water averages 978 million gallons, broken down as 462 million gallons in the winter and 516 million gallons in the summer. These numbers are used for the cost benefit analysis that was performed for each water conservation measure and then screened for feasibility of implementation (see sections 5-7 and detailed methodology and worksheets in the Appendix.)

3.4 Historic and Current Water Use

In 2007 the community consumed more than a billion gallons of potable water. During the course of an average year, MWW accounts for approximately 52% of total water usage; the City accounts for approximately 48% of total usage, with the MWW

consuming more than the City in the high tourist seasons and less in the shoulder seasons.

Figure 3.2 Historic Water Consumption



3.5 Seasonal and Peak Day Demand

Water usage triples from winter high season to summer high season. Every summer, irrigation for landscaping strains the ability to provide treated water for all users. Demand on peak days can exceed average daily demand by more than 40%. The City and the MWW must maintain filtration capacity at the filtration plant that is sufficient to meet the 7 to 10 peak-demand days each summer. Summer water usage correlates with summer temperatures and precipitation.

Figure 3.3 Weather and Water Use

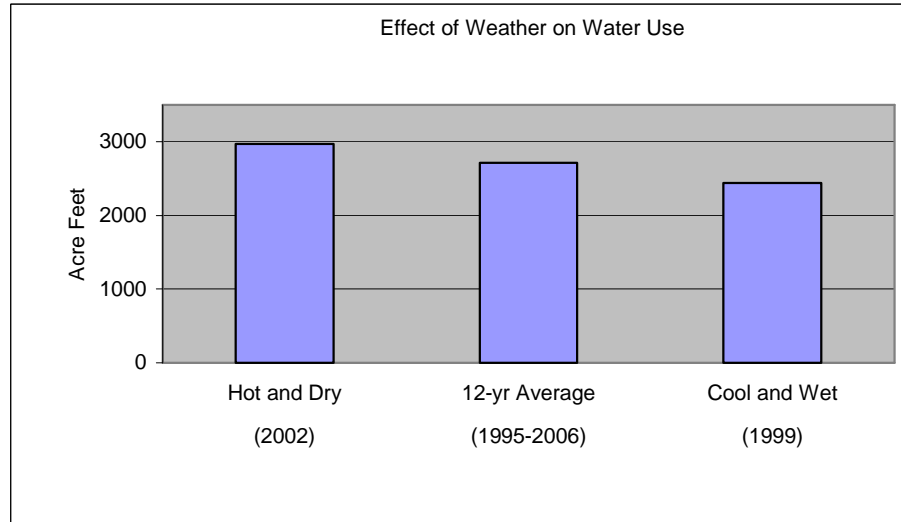
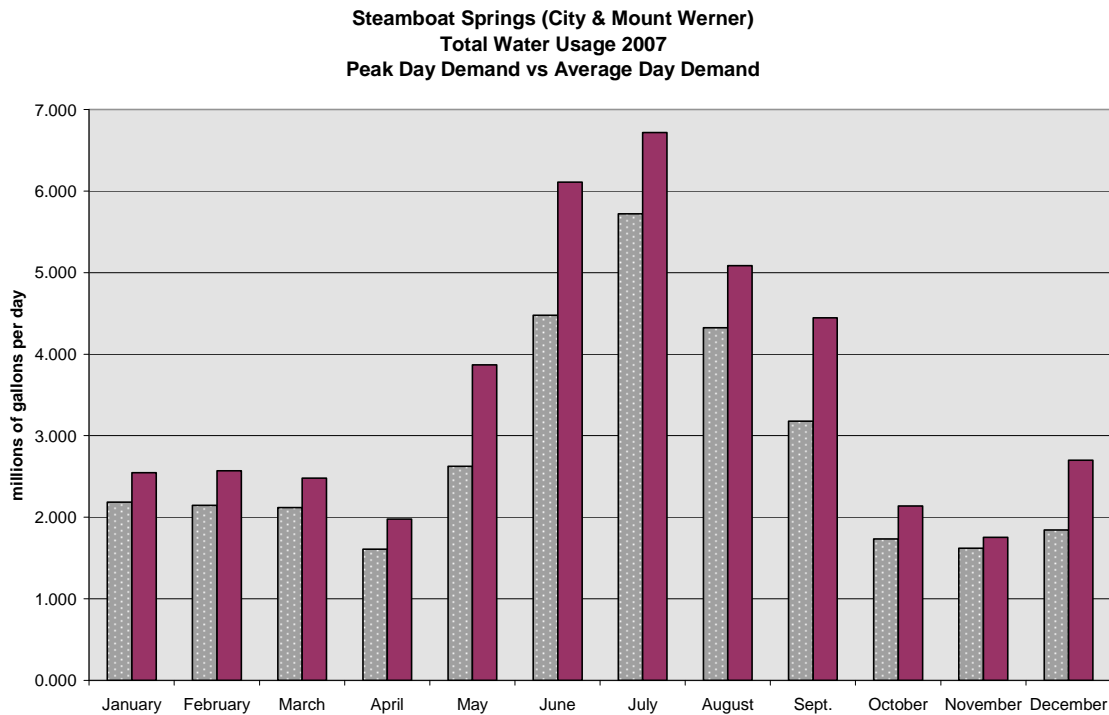


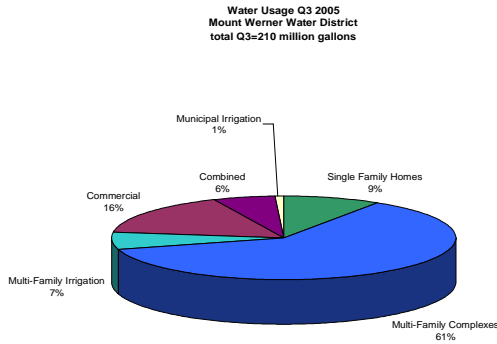
Figure 3.4 2007 Water Usage



The current average water use in the Steamboat Springs community is 3,000 AF in a service area roughly 10 square miles. The served population is different than that of traditional rural communities in that the resort area served by MWW includes a transient population of part-time residents with second homes and an even larger population of

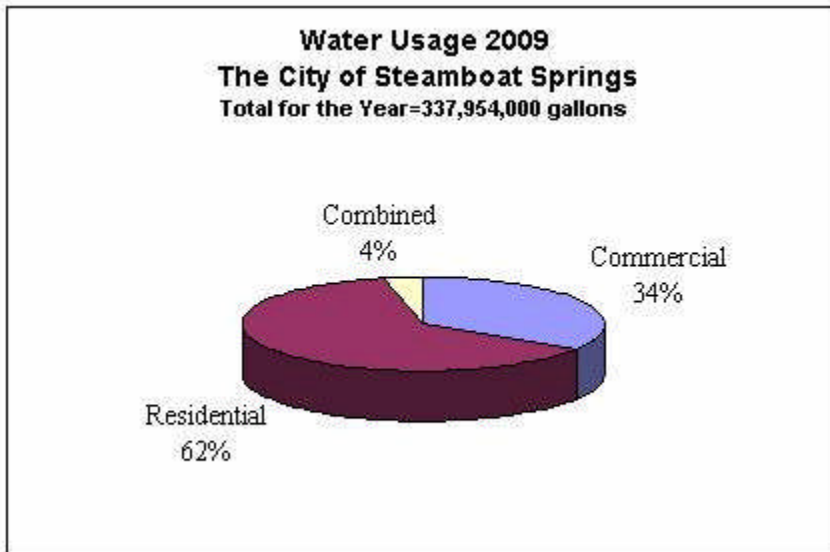
destination resort visitors and seasonal tourists and workers. Reflecting its resort character, managed multi-unit properties account for 68% of usage in the MWW followed by commercial and combined properties (22%) and single-family homes (9%).

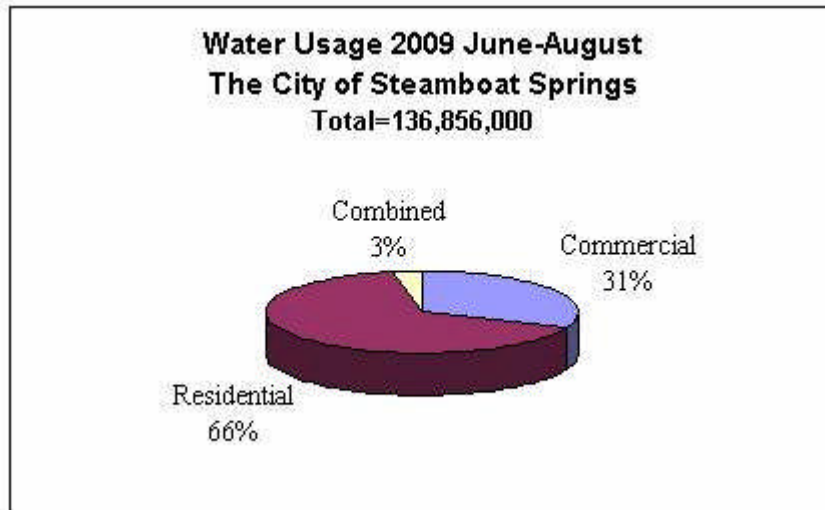
Figure 3.5 Water Usage Breakdown - MWW



The City follows more traditional usage patterns: Single-family homes account for most of the water used followed by commercial, then multi-unit properties.

Figure 3.6 a & b. Water Usage Breakdown - City





3.6 Customer Classes

The City breaks down usage/billing into three classes – 1) commercial, 2) residential, and 3) combined. These are defined as follows: Commercial - all non-residential units, industrial facilities, irrigation and Home Owner Association-run multiple housing units; Residential - all single family homes, duplex and triplex units. If the residential unit has a secondary unit as part of a duplex or triplex then the unit amount is noted; Combined - includes work/live units or any dwelling and business unit.

MWW tracks six categories (see figure 3.5), and bills users in two categories, either Commercial or Residential. Properties with a combination of uses are billed based on the percentage of square footage of residential and commercial space. Residential users are defined as all dwelling units with a full kitchen, which can be single family homes, condominium and time share units, or rental units.

Largest Users

The City and MWW keep records on their largest water users. This information is available by contacting the utilities.

3.7 System Limitations and System Water Loss

Neither the City nor MWW experience frequent shortages or supply emergencies. As discussed in the projection section of this Plan (section 4), the current modest growth rate reflects the economic downturn, however the potential for additional growth including second home ownership, tourism, growth west of Steamboat Springs, and infill has the potential to increase growth significantly.

As previously noted, the City water system infrastructure (59 miles of water mains) is significantly older than that of MWW. Accordingly, estimated water loss (non-metered water) for the City is higher than MWW largely due to older leaky cast iron and ductile

iron pipes and a higher frequency of water main breaks. These pipelines are thought to be in reasonable condition consistent with their age, however, the lifespan of the ductile iron pipes in the western part of the service area is shorter due to corrosive soils. Water loss is estimated at 19.9% for the City and 12% for MWW. Included in this calculation are: infrastructure leakage (approximately 50%), water main breaks (approximately 20%), hydrant-flushing-related loss (approximately 10%), street cleaning (10%), malfunctioning meters (5%), and non-metered park irrigation (5%). The cost benefit analysis exercise for water conservation measures (section 5) used an average of 16% loss for both systems.

The City is served with five storage tanks with a combined volume of 4.5 million gallons. Additional storage tanks have been proposed.

3.8 The End of the Line

It is important to note that water use and the capacity of the wastewater treatment plant are interrelated. The current capacity of the Steamboat Springs Wastewater Treatment Plant (WWTP) is 12 MGD. In 2008 the WWTP treated over a billion gallons of wastewater, costing over a million dollars. A portion of treated effluent is put to beneficial use to irrigate a hay meadow. Water conservation efforts, especially indoor usage reductions, will help reduce operating costs associated with wastewater treatment, as well as add years to the life of the plant.

3.9 Water Rates

Both districts use a tiered water rate system, described in section 6 and detailed in the Appendix.

**TABLE 3.1 MOUNT WERNER WATER AND SANITATION DISTRICT
SCHEDULE OF FEES AND CHARGES**

RESIDENTIAL CUSTOMERS		
Quarterly charge/unit	Volume	Base
Water Service ¹	Tier I : 0 to 95 cubic meters = \$0.23 / m ³	\$21.84
	Tier II : 96-420 cubic meters = \$0.40 / m ³	
	Tier III : over 420 cubic meters = \$0.81 / m ³	
Residential Irrigation Meter ₂	(see note 2)	none
Wastewater Service ³	(\$8.82 collection + \$31.77 treatment = \$40.59)	\$40.59
COMMERCIAL CUSTOMERS		
Quarterly charge/unit	Volume	Base
Water Service ¹	Over 0 m ³ = \$0.32 / m ³	\$21.84

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Commercial Irrigation Meter	Over 0 m ³ = \$0.40 / m ³	None
Wastewater Service ³	1st and 4th quarters – \$0.90 per m ³ of actual water use (\$0.20/ m ³ collection + \$0.70/ m ³ treatment = \$0.90/ m ³) 2nd and 3rd quarters – \$0.90 per m ³ of average winter consumption (average of 1st and 4th quarter water use) (\$0.20/ m ³ collection + \$0.70/ m ³ treatment = \$0.90/ m ³)	None

TABLE 3.2 CITY OF STEAMBOAT SPRINGS WATER RATES AND CHARGES 2010

Residential

Water Base Charge \$15.00 per month

Sewer Base Charge \$26.88 per month

Water Volume Rate

1,000-4,000	\$1.58 per 1000 gal
5,000-12,000	\$2.37 per 1000 gal
13,000-20,000 Sewer Volume Rate	\$3.63 per 1000 gal
21,000-28,000	\$4.73 per 1000 gal
29,000 +	\$7.10 per 1000 gal

Sewer Only Base Charge

\$26.88 per month

Commercial

Water Base Charge \$19.50 per month

Sewer Base Charge \$23.61 per month

Water Volume Rate

\$4.17 per 1000 gal

Sewer Volume Rate

\$4.97 per 1000 gal of water used

An average volume from October-March is used to bill April-September sewer volume

Sewer Only Base Charge

\$23.61 per month

COMBINED USAGE (Residential & Commercial Combined Properties)

Water

Base - \$19.50 per month

Volume - \$4.17 per 1000 gal

Sewer

\$23.61 + the greater of \$26.88 x # of res. units OR \$4.97 x water volume.

4.0 MEETING FUTURE DEMAND

4.1 Projections

4.1.1 Population Projections

Current (2010) city population is estimated at 12,170. Population projections appear in Table 4.1 below.

Table 4.1 Projected Population

Year	Projected Population*
2010	12,170
2015	13,697
2020	15,564
2025	17,435
2030	19,306
2035	21,178

*These numbers are permanent population and do not reflect tourism and second home population fluctuations.

4.1.2 Projected Water Demand

In order to project future water demand two types of methods were employed, one using Equivalent Residential Unit (EQR), the other gallons per capita per day (gpcd) (please see methodology in Appendix). The selected method is EQR which provides a means of normalizing water demands for resort communities like Steamboat Springs with a highly fluctuating transient and second home population. EQR provides a more accurate measure of historic and projected water demand by using a “common denominator” approach which establishes a typical single family residence as one EQR and applies this to water demand for different customer use classes. For Steamboat Springs, an EQR is considered to be a three bedroom, 2 bathroom home up to 2,500 square feet and equates to a maximum day water demand of 600 gpd.

EQR does not directly correlate to the number of taps because EQR is dependent on the number and type of plumbing fixtures in a building. Different plumbing fixtures are assigned points representative of how much water the fixture normally uses. There are currently approximately 3,500 taps within the City, but more than 5,000 EQR. When a multi-family building with 20 three bedroom/two bath units is connected to the City system, they purchase a single tap for the building, but are considered 20 EQR from a

system demand standpoint. Each building category is assigned an EQR unit listed below.

Type of Use Converted to EQR Units

- Single Family Residence = 1.00 unit
 - Single Family Estate = 1.50 unit
 - Multi-Family (2 Bedroom) = 0.85 unit
 - Multi-Family (3 Bedroom) = 1.05 unit
 - Multi-Family (4 Bedroom) = 1.25 unit
 - Mobile Homes = 1.00 unit
 - Commercial = 4.44/acre
 - Industrial = 2.13 units
 - Parks/Open Space = Site Specific
- (Water and Wastewater Master Plan Updates, McLaughlin Water 2009).

For this plan all existing customer classes were grouped into the following three categories; residential, combined and commercial. Residential customers are characterized as all types of residential development, including multifamily housing. Combined customers are defined as residential and commercial customers housed in a single structure served by a single service line. Commercial customers include all other types of customers that are neither residential nor combined.

MWW tracks six customer use categories and were combined as follows: Residential includes single family homes and multi-family complexes including any dwelling with a full kitchen; Commercial remains as is; and Combined includes multi-family irrigation and municipal irrigation.

The following table displays the existing EQR values produced by the McLaughlin Report and extrapolates an amount for each customer class according to their water usage.

TABLE 4.2 Customer Class Units and Water Use - Existing

Approximate Number of Existing Units (2009)						
	City		MWW		SBT II	
Customer Class	% Water Use	Units	% Water Use	Units	% Water Use	Units
Commercial	32.8	1,754	25	1,693	0	0
Residential	60.8	3,251	68	4,604	100	406
Combined	6.4	342	7	474	0	0
Total Number of Units		5,347		6,771		406

The *Steamboat Water Supply Master Plan* provided a detailed evaluation of the past and projected water use within both the City and MWW. The average, maximum day and total demands per EQR established in that report are presented in the following table.

TABLE 4.3 Average Daily EQR Water Demand

Projected Average Daily EQR Water Demand (gpd per EQR)

Year	City, gpd per EQR	MWW gpd per EQR	Total, gpd per EQR
2004	232	231	232
2005	230	232	231
2006	241	241	241
2007	237	247	242
Average	235	238	237

Since the table above only included years 2004-2007 it is necessary to adjust the average gpd per EQR to better reflect current data. Due to significant changes in the economy, lower tourism levels, increased unemployment, water rate increases and reduced occupancy the years 2008 and 2009 have seen a dramatic decrease in water use. Therefore by examining actual water use data, this value was decreased by 12% from 237 to 209 gpd per EQR. This adjustment is applied in the Table below which also projects growth rate by customer class and quantifies water demand based on the revised EQR multiplier.

TABLE 4.4 EQR Water Use Adjustments

	EQR Units	EQR Factor	EQR Values	Total Gallons per day average	% of Total Water Use
Commercial	3,447	1.1	230	792,366	28%
Residential	8,261	1	209	1,726,603	66%
Combined	816	1	209	170,581	7%
Totals	12524			2,689,549	

The estimated annual growth of EQRs appears below. The growth rate assumptions were taken from the *Water and Wastewater Master Rate Study* (2010) conducted by Red Oak Consulting and represent the best available data.

Projected annual growth in equivalent residential units (EQRs) is as follows:

- 2010 – 0.10%
- 2011 – 0.40%
- 2012 – 0.80%
- 2013 through 2019 – 1.69%

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Table 4.5 Projections by Customer Class

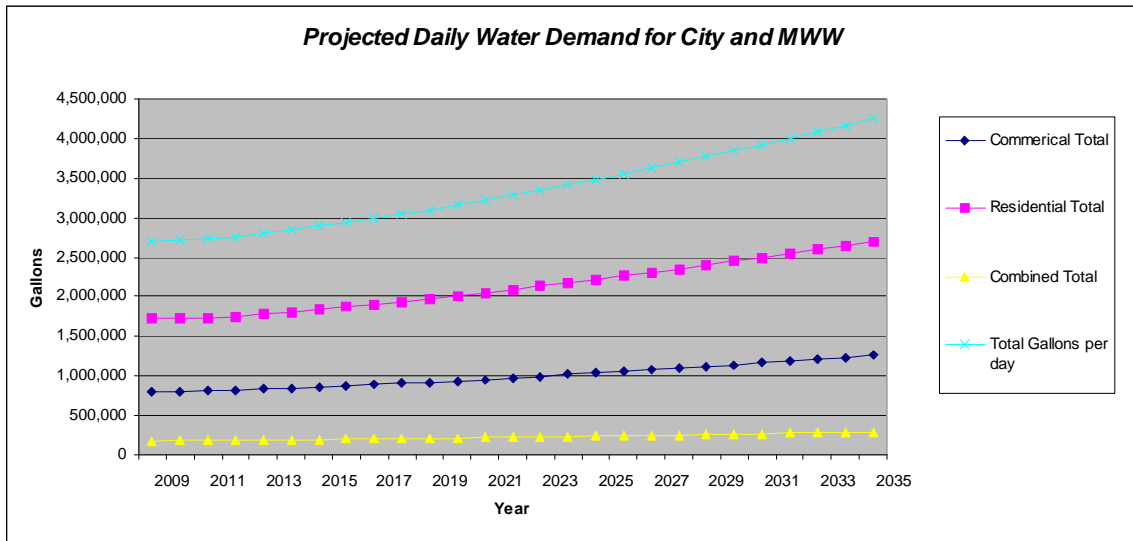
Year	Commercial	Residential	Combined	Total	Commercial Total (gal)	Residential Total (gal)	Combined Total (gal)	Total Gallons per day	Total Gallons per year Demand	PRODUCED (15% increase due to loss) Gallons	Produced (AF)
EQR	1.10	1.00	1.00								
	230	209	209								
2009	3,447	8,261	816	12,524	792,366	1,726,603	170,544	2,689,512	981,671,890	1,128,922,674	3,465
2010 (0.1% Total Growth Rate)	3,510	8,274	878	12,536	807,341	1,729,264	183,407	2,720,011	992,803,998	1,141,724,598	3,504
2011 (0.4% Total Growth Rate)	3,524	8,307	881	12,586	810,570	1,736,181	184,140	2,730,891	996,775,214	1,146,291,496	3,518
2012 (0.8% Total Growth Rate)	3,552	8,374	888	12,687	817,055	1,750,070	185,613	2,752,738	1,004,749,416	1,155,461,828	3,546
2013 (1.69% Total Growth Rate)	3,612	8,515	903	12,902	830,863	1,779,646	188,750	2,799,259	1,021,729,681	1,174,989,133	3,606
2014 (1.69% Total Growth Rate)	3,673	8,659	918	13,120	844,904	1,809,722	191,940	2,846,567	1,038,996,912	1,194,846,449	3,667
2015 (1.69% Total Growth Rate)	3,736	8,805	934	13,341	859,183	1,840,307	195,184	2,894,674	1,056,555,960	1,215,039,354	3,729
2016 (1.69% Total Growth Rate)	3,799	8,954	950	13,567	873,703	1,871,408	198,483	2,943,594	1,074,411,756	1,235,573,519	3,792
2017 (1.69% Total Growth Rate)	3,863	9,105	966	13,796	888,469	1,903,035	201,837	2,993,341	1,092,569,314	1,256,454,712	3,856
2018 (1.69% Total Growth Rate)	3,928	9,259	982	14,029	903,484	1,935,196	205,248	3,043,928	1,111,033,736	1,277,688,796	3,921
2019 (1.69% Total Growth Rate)	3,995	9,416	999	14,266	918,753	1,967,901	208,717	3,095,370	1,129,810,206	1,299,281,737	3,987
2020 (2% Total Growth Rate)	4,074	9,604	1,019	14,552	937,128	2,007,259	212,891	3,157,278	1,152,406,410	1,325,267,372	4,067
2021 (2% Total Growth Rate)	4,156	9,796	1,039	14,843	955,871	2,047,404	217,149	3,220,423	1,175,454,538	1,351,772,719	4,148
2022 (2% Total Growth Rate)	4,239	9,992	1,060	15,140	974,988	2,088,352	221,492	3,284,832	1,198,963,629	1,378,808,174	4,231

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2023 (2% Total Growth Rate)	4,324	10,192	1,081	15,442	994,488	2,130,119	225,922	3,350,528	1,222,942,902	1,406,384,337	4,316
2024 (2% Total Growth Rate)	4,410	10,396	1,103	15,751	1,014,378	2,172,721	230,440	3,417,539	1,247,401,760	1,434,512,024	4,402
2025 (2% Total Growth Rate)	4,499	10,604	1,125	16,066	1,034,665	2,216,176	235,049	3,485,890	1,272,349,795	1,463,202,264	4,490
2026 (2% Total Growth Rate)	4,589	10,816	1,147	16,388	1,055,358	2,260,499	239,750	3,555,608	1,297,796,791	1,492,466,309	4,580
2027 (2% Total Growth Rate)	4,680	11,032	1,170	16,715	1,076,466	2,305,709	244,545	3,626,720	1,323,752,727	1,522,315,636	4,672
2028 (2% Total Growth Rate)	4,774	11,253	1,193	17,050	1,097,995	2,351,823	249,436	3,699,254	1,350,227,781	1,552,761,948	4,765
2029 (2% Total Growth Rate)	4,869	11,478	1,217	17,391	1,119,955	2,398,860	254,425	3,773,239	1,377,232,337	1,583,817,187	4,861
2030 (2% Total Growth Rate)	4,967	11,707	1,242	17,738	1,142,354	2,446,837	259,513	3,848,704	1,404,776,984	1,615,493,531	4,958
2031 (2% Total Growth Rate)	5,066	11,942	1,267	18,093	1,165,201	2,495,774	264,703	3,925,678	1,432,872,523	1,647,803,402	5,057
2032 (2% Total Growth Rate)	5,167	12,180	1,292	18,455	1,188,505	2,545,689	269,997	4,004,192	1,461,529,974	1,680,759,470	5,158
2033 (2% Total Growth Rate)	5,271	12,424	1,318	18,824	1,212,275	2,596,603	275,397	4,084,276	1,490,760,573	1,714,374,659	5,261
2034 (2% Total Growth Rate)	5,376	12,672	1,344	19,201	1,236,521	2,648,535	280,905	4,165,961	1,520,575,785	1,748,662,152	5,366
2035 (2% Total Growth Rate)	5,484	12,926	1,371	19,585	1,261,251	2,701,506	286,523	4,249,280	1,550,987,300	1,783,635,395	5,474
2035 (2% Total Growth Rate)	5,484	12,926	1,371	19,585	1,261,251	2,701,506	286,523	4,249,280	1,550,987,300	1,783,635,395	5,474

Note: 15% loss, the average for the 3 districts, is factored in to arrive at total water produced

Figure 4.1 Projections by Customer Class



For additional discussion and data please refer to the Appendix.

4.2 Ability to Meet Future Demand

The *Steamboat Water Supply Master Plan* recommends that a Water Conservation Plan and a Drought Response Plan be developed and adopted. The plan indicates there is future water supply source expansion potential via modest expansion of the wells (2,000 AF), and access to Elk River sources (1,000 - 3,000 AF).

Uncertainties for long range water supply planning include the possibility of a Colorado Compact call, a large scale fire in the Fish Creek basin, annexation of land and related development west of Steamboat Springs, climate change, and extended drought. These uncertainties make an even stronger case for water conservation.

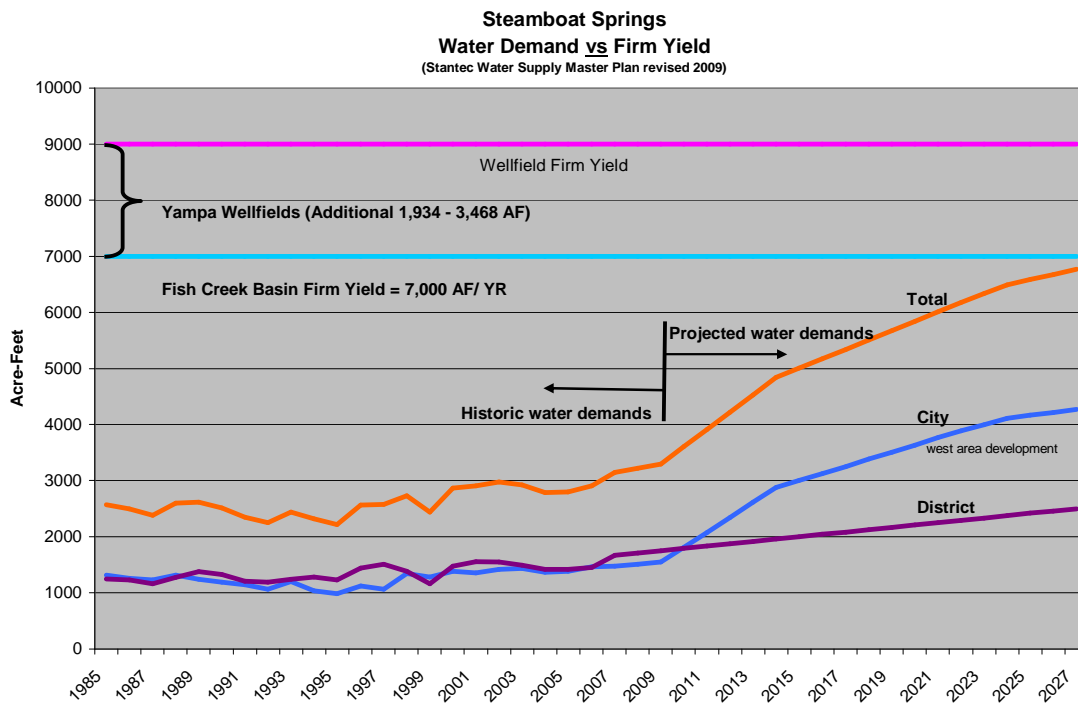
The Steamboat Water Supply Master Plan (Nov. 2008) section 5.1.3 estimates the ability to meet future demand as follows:

TABLE 4.6 Meeting Future Demand

	City	District	Combined	Annual (AF/yr.)
	Average Day (mgd)	Average Day (mgd)	Average Day (mgd)	
Current (2007) Demand	1.32	1.49	2.81	3,141
2027 Projected Demand:	3.81*	2.23	6.04	6,040
Firm Yield/Supply:				
Fish Creek Basin				7,000

Yampa River Wells				2,000 – 3,500
Elk River Right (conditional)				769 (w/o storage) 1,000 – 3,000 (depending upon amount of storage Developed)
*includes west of Steamboat demand 1.66 mgd				

Figure 4.2 Water Demand and Available Supply



5.0 WATER CONSERVATION MEASURES and PROGRAMS

5.1 Overview of Best Management Practices

5.1.1 Best Management Practices – Indoor

- Leak detection and repair

- Leaks can add up to significant water waste - one drip per second = up to 2,700 gal/yr
- Replace or retrofit appliances and fixtures
 - Toilets
 - 25% of water going into the home is flushed down the toilet
 - installing low flow, dual flush or even toilet dams can reduce this amount significantly
 - Install Water Saving Shower Heads – an effective and inexpensive way to save water
 - Faucet Aerators – cost effective and easy to install
 - Dish washers
 - Older models use up to 13 gal/wash vs. new models ave. 4 gal.
 - Clothes washers
 - Older models use up to 40 gal/wash vs. new model ave. 27 gal.
 - Install on-demand hot water heaters or hot water circulating pumps
- Behavior changes
 - Shorter showers
 - A 5 minute shower uses about 10 gal. - a bath uses about 40 gal.
 - Don't leave water running needlessly
 - Running water while brushing teeth can use up to 4 gal. or 2 gal./minute. Brushing with tap off uses about .25 gal.
 - Wash only full loads (clothes, dishwasher)
 - Use bucket to wash car instead of hose
 - A hose uses about 140 gal/hour
- Re-use water whenever possible
 - Example – reused dishwater can be used to water plants
- Water audits & tracking
 - Audits help users better understand areas for improvement
 - Learning to interpret a water bill and compare to historic usage is a useful way to manage water use

5.1.2 Best Management Practices – Outdoor

- Potable water should be used for beneficial purposes and waste is discouraged
- No outdoor watering 10AM – 6PM
- Hose irrigation with spring-loaded nozzle only; no free-running hoses
- Refrain from tree-planting and the seeding or sodding of new lawns from June 15th through August 31st
- Use native grasses and shrubs and drought-tolerant species on new or re-developing properties
- Refrain from water-intensive landscapes
- Limit filling of swimming pools to one filling per year, unless draining for repairs is necessary.
- Additional recommended irrigation practices:
 - Consider xeriscape practices

- Mulch plants, trees and shrubs
- Plan landscaping based on sun, moisture, etc.
- Use drip irrigation instead of spray
- Install rain shut-off or moisture sensors on irrigation systems.
- Sweep impervious surfaces such as driveways, parking areas, walkways instead of power washing or hosing down
- Pools and spas:
 - Cover pools and spas with insulated covers when not in use to reduce evaporation (in this climate annual evaporation losses can be 2.6 times the surface area in cu.ft)
 - Detect and repair leaks
- Refrain from installation of outdoor water features such as fountains which lose water to system leaks and evaporation.

5.1.3 Industrial, Commercial & Institutional (ICI) Best Management Practices

Best Management Practices for industrial, commercial and institutional users should be developed for communication to these users.

- Restaurants
- Lodging properties & hotels
- Ski areas
- Carwashes
- Golf courses
- Laundromats
- Gravel pits
- Public pool facilities
- Institutions
 - Hospitals
 - Schools/college
 - City Parks

5.1.4 Water District Measures

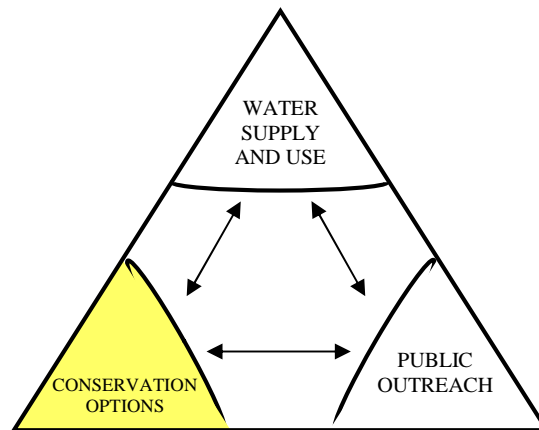
- Set and communicate goals, targets
- System inspections – loss reduction
- Improve metering accuracy and efficiency
 - Retrofit meters with wireless meter reading transponders
- Reduce un-metered use
- Adopt a conservation-minded rate structure
- User education
 - General user information on a frequent and ongoing basis
 - Targeted education
 - Focus on large users such as lodging properties, restaurants
 - Provide workshops and other materials for irrigators, landscapers
- User data tracking, data management, communication
 - Web-based software for live reporting

- Encourage building code changes
 - Work with architects, plumbers, planners
- Implement rebate and other incentive programs
- Allocate ongoing funds for water conservation programs

5.2 Existing Water Conservation Practices

Over the years, both districts have embarked upon a host of water conservation programs. It is anticipated and proposed in the implementation section of this plan, that many of these continue and that they be enhanced, as they have helped to improve water savings and set the stage for a water conservation culture. Little tracking has taken place, however, as to the measurable success of these programs and practices. A list of programs and measures undertaken by MWW and the City appear in the Appendix. Additional discussion relative to certain measures is discussed in section 6 below.

6.0 MEETING STATE-MANDATED CONSERVATION MEASURES



State of Colorado Mandate

The Colorado Water Conservation Act of 1991 and amended in 2004, C.R.S. §37-60-126, created the Office of Water Conservation and Drought Planning (OWCDP) and requires entities that supply 2000 acre-feet or more of water annually to develop, adopt, make publicly available, and implement a water conservation plan. Plans must be submitted to the Colorado Water Conservation Board (CWCB) which has developed guidelines that are required to be met prior to their approval.

The City and MWW each fall below the 2000 acre-foot threshold mandated by C.R.S. §37-60-126. However, together they supply 3000 acre-feet to their combined constituencies through the shared water supply system. While the City and MWW technically do not fall under the state mandate, the two entities desire to be proactive and accordingly have committed to meet the mandate.

The CWCB criteria include the promotion of the following:

- 1) Water-efficient fixtures and appliances, including toilets, urinals, showerheads, faucets, washing machines and dishwashers;
- 2) Low-water use landscapes and irrigation;
- 3) Water-efficient commercial and industrial water-using processes;
- 4) Water reuse systems, both potable and non-potable;
- 5) Distribution system leak repair;
- 6) Dissemination of information regarding water use efficiency measures, including public education, customer water use audits, and water saving demonstrations;
- 7) Water rate structures designed to encourage water use efficiency in a fiscally responsible manner;
- 8) Regulatory measures, including standards for the use of water efficiency fixtures and landscapes, ordinances, codes, and other laws designed to encourage water use efficiency;
- 9) Incentives to implement water use efficiency techniques, including rebates to customers to encourage the installation of water use efficiency measures.

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

Purpose

Use of water saving appliances and plumbing fixtures including toilets, kitchen and lavatory faucets, and showerheads will reduce the rate of water consumption for residential and commercial customers. The Federal Energy Policy Act of 1992 requires that toilets manufactured in the United States after January 1, 1994 be ultra low-volume (1.6 gallon per flush). As growth within the service area continues and natural replacement of old plumbing fixtures occurs through repairs and remodeling, increased efficiency will be achieved through the installation of modern fixtures. The number of residences in the service area will grow significantly over the next 20 years. Therefore, the water conservation associated with water efficient fixtures and appliances could also be significant.

Current Program

The City has adopted the International Plumbing Code (considered passive water conservation) which requires that maximum flow rates and consumption for plumbing fixtures and fixture fittings be met for new construction as follows:

Product	Maximum Water Use
Showerheads	2.5 gallons per minute at 80 psi
Lavatory faucets	2.2 gallons per minute at 60 psi
Urinals	1.0 gallons per flush
Toilets	1.6 gallons per flush

Additionally, the City offered rebates in the mid-1990's to incentivize homeowners to retrofit their plumbing fixtures to more water efficient ones.

Suggested Additions to the Program

The City and MWW should continue to encourage retrofits, potentially by offering rebates.

To demonstrate leadership, the City and MWW should encourage the installation of retrofit devices in public facilities including ultra low-volume toilets, flow reduction devices, and self-canceling faucets (timed, infrared, or motion-controlled).

For educational purposes, MWW and the City could assemble and display sample retrofit kits including state of the art fixtures as well as insulation for hot water pipes, dye tablets to detect leaks, etc. The entities should investigate possibilities for working with local plumbing and hardware vendors to educate the public.

6.2 Low water-use landscapes and efficient irrigation

Purpose

An estimated 200 acre-feet of water could be conserved each year if residents and business owners simply cut their use by 10%. This goal could be easily achieved by more careful attention to several fundamental irrigation tips to improve efficiency. Additional water conservation could be realized by transforming traditional water-intensive landscapes to utilize xeriscape concepts. It is important to remember that, while water used indoors is largely returned to the river through the wastewater treatment plant, irrigation water is consumed and largely removed from the watershed through evaporative processes.

Domestic irrigation accounts for a significant portion of the total current and projected water needs in our community. The need for irrigation water occurs during the months of May through September with peak demands in June, July, and August. Because irrigation is a significant component of the total water usage, increases in efficiency could be beneficial to in-stream flows during the late summer and early fall, and reductions in irrigation return flows could have a positive impact on water quality.

Current Program

Each year, the City and MWW distribute doorhanger brochures that provide customers with irrigation facts and tips. This brochure is targeted at the single-family homeowners who make irrigation decisions every day. For the Mount Werner District, this brochure targets only 9% of water usage in the District. The largest users of water in the District are managed properties representing nearly 70% of water usage. Therefore, in 2007 MWW launched a conservation certification program for managed properties to encourage the adoption of basic conservation practices and policies. To date there are six property management companies participating covering 40 residential complexes and 1,686 residential units as well as ten commercial complexes.

In late 2006, the Steamboat Springs Chamber Resort Association partnered with Environmental Solutions Unltd (ESU), a local environmental consultant firm, to

implement a Sustainable Business Program (SBP) which was launched in early 2007. Among other initiatives, this program focuses on educating local businesses about water conservation including indoor and outdoor landscape and irrigation best practices. To date, 79 businesses have participated in the program.

In 2009, a brochure and other informative pieces were developed and widely distributed through open houses, trade shows and events. The City website posted a detailed listing of low-water demand landscape plants that are suitable for and/or indigenous to our area.

In 2009, a workshop was held at the Yampa River Botanic Garden by the Sustainable Business Program (SBP) providing specialists in the xeriscape and native plant gardening fields to present best available technology to attendees. Three gardens were toured as part of the program. Property managers and their HOA's, landscaping firms, and designers were also targeted. The SBP has additionally hosted a networking luncheon with a water conservation theme.

There is a xeriscape demonstration garden located at the Botanic Park in Steamboat Springs.

Suggested Additions to the Program

The City and MWW should promote irrigation audits to residential and commercial customers and landscape managers. These audits could be performed by the private sector and would evaluate the efficiency of irrigation systems, practices and timing. Providing product information at a trade-show-type community event, or providing links on the website, would help consumers identify water efficient appliances and equipment.

The City could join MWW efforts in encouraging managed properties to implement more efficient landscape and irrigation practices. Working with the aforementioned SBP could provide added benefits and outreach.

6.3 Water-efficient industrial water-using processes and commercial use

Purpose

For large volume commercial and industrial users, incremental water savings through the use of water efficient fixtures and guest messaging could amount to significant savings in water use as well as reduce water, sewer, and energy bills.

The combined service areas include approximately 18,000 pillows (available rental beds), more than 100 restaurants, and a number of other large volume users such as the Yampa Valley Medical Center, City of Steamboat Springs parks, and schools. It should be noted that the Rolling Stone Ranch Golf Course leases raw water from the MWW District for irrigation, and the Steamboat Ski Resort leases raw water for snowmaking.

Current Program

MWW encourages lodging properties to place conservation messages in guest rooms encouraging towel and bedsheet reuse. In 2006, MWW had tent cards and placards from

Project Planet placed in six motels in the area and provided the managers with information about how to locate additional messages for this purpose. Several large resort properties in the base area already employ this guest messaging. Many motels do not employ guest messaging because of the high turnover rate in their guest rooms.

Suggested Additions to the Program

MWW and the City should continue to encourage the guest-messaging program with hotels and motels.

MWW and the City could provide information for restaurants and other commercial establishments to increase awareness about the potential benefits of water-use efficiency measures. Both districts could investigate the feasibility and cost-effectiveness of a program to encourage retrofitting water efficient appliances and fixtures by commercial customers. The districts could also consider working alongside the Steamboat Sustainable Business Program to support current and on-going efforts already in place to educate businesses on water conservation practices and technology.

6.4 Water reuse systems, both potable and non-potable

Purpose

Reuse systems can have a significant positive impact on water use, especially during peak periods.

Current Program

Water reuse systems that are known to exist include car washes, a public transit vehicle wash, and a golf cart washwater system. The City irrigates with treated wastewater at some facilities.

Suggested Additions to the Program

MWW and the City should encourage the use of treated effluent for landscape irrigation, and industrial purposes that do not require the level of treatment necessary for potable uses. It will help to conserve in-stream flows below municipal diversions, reduce capital costs for treatment and distribution facilities, and reduce operating costs. The City should also consider water reuse systems for proposed developments in the West Area of Steamboat Springs if permitted by State regulations.

6.5 Distribution system leak repair

Purpose

In the community's water system, water distribution losses (non-revenue water) occur in three forms:

- 1) metering inaccuracy;
- 2) unmetered usage;
- 3) distribution system leakage and water main breaks.

One of the primary effects of distribution system losses is reduced revenue to the districts. This is obvious in the case of metering inaccuracy and unmetered use. However, in the case of distribution system leakage, not only do MWW and the City experience higher pumping and treatment costs, but higher volume diversions cause lower flows in Fish Creek and the Yampa River, even though subsurface leakage eventually finds its way back to the stream. Therefore, it is in the best interest of MWW and the City to reduce overall distribution system losses (non-revenue water) to an acceptable level. During the last few years, MWW and the City have established programs to improve metering of its customers and reduce losses to the distribution system.

Current Program

The following programs are currently in place and are directed at reducing system losses and achieving the distribution system improvements described above.

Improve Metering Accuracy and Maintenance:

Water meters tend to wear out and slow down with age, failing to register all of the water passing through. Irrigation meters are particularly vulnerable to ice damage. Presently, MWW and the City replace failing meters when a problem is identified.

MWW and the City regularly compare customer usage with previous year records. Significant discrepancies trigger a service call to check for possible in-house leaks and the accuracy of the meter. MWW is currently retrofitting its meters with wireless transponders that can automatically read and report from meters twice a day.

Reduce Unmetered Use:

Fire hydrant water used for fire department training and hydrant flushing for system maintenance are two contributors to unmetered use in both districts. Also MWW provides building contractors with unmetered water from their shop at Fetcher Pond.

Detect and Repair Distribution System Leaks:

MWW and the City currently identify and repair leaks which are evident in obvious surface flows. Water is tested for fluoride content to determine if it is treated water or groundwater. Booster pump stations and pressure reducing valve (PRV) vaults are routinely checked.

Suggested Additions to the Program

Improve Metering Accuracy and Maintenance:

The entities could adopt a more aggressive policy of systematically changing out water meters on a scheduled basis, according to size, to maintain accuracy. The City is planning to begin retrofitting meters to smart meters as early as next year. These will include automatic wireless transponders that provide daily readings to identify anomalies and possible leaks.

Reduce Unmetered Use:

Fire hydrant water used for fire department training and system maintenance should be estimated and reported. By improving methods of quantifying these losses, a better idea can be had of the amount of water loss occurring from these practices.

Detect and Repair Distribution System Leaks:

MWW and the City could enhance the program to check water mains and fire hydrants for leakage by pursuing best available technology for leak detection.

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

Purpose

The ultimate success of water conservation programs depends upon the actions of the people who use the water. Development of a conservation ethic through public awareness and education is therefore necessary to the overall success of this conservation program. Making information available to the public regarding the benefits of water conservation and the available methods of conservation will help to foster such a conservation culture.

Current Program

The MWW District and City periodically disseminate conservation information through customer newsletters, door hangers and press releases.

Each spring and fall, the MWW District hosts Middle School children at the Fish Creek Filtration Plant where they learn about where our community water comes from and how to use it responsibly.

The City provides tours of the Wastewater Treatment Plant to elementary school students annually.

In the past year, both districts have attended and promoted community events that raise water conservation awareness. Additionally, displays have been set up in the library and other high traffic areas, and a video, Liquid Assets, was shown to the public at the library.

Suggested Additions to the Program

During National Drinking Water Week in early May, the City and MWW could conduct a water conservation education program in the local elementary and middle schools.

With the assistance of the City and MWW, the Bud Werner Library could establish a water conservation shelf in the resource section of the library. The entities would maintain and update this information on a regular basis.

Consider hosting an annual community event supporting the water conservation education theme. The event could include a “trade show” type exhibit of plumbing fixtures, appliances, landscaping/xeriscaping information, irrigation practices and control devices, etc.

Encourage continued retrofits of old appliances, fixtures and equipment.

Work with property managers and homeowners associations on improvements to units.

6.7 Water rate structures designed to encourage water use efficiency in fiscally responsible manner

Purpose

An appropriate rate structure can incentivize customers to implement measures to use water more efficiently and reduce demands.

Current Program

The City and MWW have implemented inclined block rate structures in which the rate per thousand gallons of usage increases for higher levels of use at prescribed usage thresholds. The City has long used this type of rate structure. In 2007, the MWW District introduced its inclined block rate structure: this eliminated the base volume, reduced the base charge accordingly, and introduced a three-tiered rate structure which used first quarter water use statistics to differentiate between indoor base use and discretionary outdoor use. Revenues from the highest-use tier 3 are used to fund conservation programs.

Suggested Additions to the Program

The City recently increased rates after embarking on a water rate study that evaluated future financial needs and alternatives to meet them. Additional rate increases are planned annually through 2015 and will be evaluated every three years. MWW is currently considering rate increases.

6.8 Regulatory measures, including standards for the use of efficient fixtures and landscapes, and ordinances, codes, or other law designed to encourage water use efficiency

Purpose

Regulations to require the use of certain water conservation measures, such as water efficiency standards for plumbing fixtures and use of water efficient landscaping, should be employed to facilitate and enforce implementation of reasonable conservation measures. Districts should encourage local governments to implement these requirements in building codes or as ordinances.

Local governments may need to adopt mandatory measures to protect public health and safety in response to emergency or drought situations:

Colorado experiences a wide range of climatic conditions from year-to-year as well as from season to season. Climatological records and research conducted by the National Center for Atmospheric Research, indicated a pattern of major droughts in Colorado occurring approximately every 20 years. Water suppliers in the West accommodate this uncertainty through reservoir storage, consideration of "firm yields" in estimates of water

availability, raw water supply development, and "demand side" strategies such as voluntary or mandatory restrictions on outdoor water usage. Plans to reduce usage are necessary to stretch the available water supply through periods of drought.

Water supply systems are also at risk from possible forest fire, floods, failure of dams, mains, wells, and contamination of all or part of the raw water supply. In emergency or drought situations, contingency plans should be designed for implementation of mandatory measures in stages that minimize impacts to the economy, life-styles, and environment of the community. Plans should also be flexible in response to worsening or improving conditions.

Current Program

Both the City and MWW discourage casual use of potable water in their regulations. In 2007, MWW amended its Rules and Regulations:

- 1) to limit the size and consumption of water features in landscape design;
- 2) to eliminate the 3000SF allowance for irrigated areas in the calculation of tap fees;
- 3) to raise the tap fee charged for irrigated areas.

The City and MWW have the authority to levy fines for violations of these regulations.

Suggested Additions to the Program

The City and MWW will continue to encourage methods for water-efficient landscaping and irrigation and to reduce waste.

The City is exploring methods to require future development to address water supply needs.

Both districts have adopted the three-tiered preparedness plan for drought and other water emergencies (section 7.0).

6.9 Incentives to implement water use efficiency techniques including rebates to customers or others to encourage the installation of efficient fixtures and appliances.

Purpose

In addition to the financial incentives to conserve water, other incentives are possible. However, conservation programs, water audits, education, monitoring and verification of efficiency over time, and incentives for private sector efficiency projects all cost money.

Current Program

The MWW Budget includes a line item (2009 Budget \$4,000) to support its conservation initiatives. The revenue collected from Tier 3 users is directed to this purpose.

Suggested Additions to the Program

The City and MWW should improve internal programs and explore partnering with the private sector to provide other forms of customer-targeted education and audit programs for the purpose of broadening the basis of water conservation efforts in the community. Any funding for this purpose from the City would require a new budget line item.

7.0 DROUGHT and WATER EMERGENCY PREPAREDNESS

7.1 Statement of Need

As discussed previously in section 6.8, Colorado experiences a wide range of climatic conditions causing potential drought risk. Plans to reduce usage are necessary to stretch the available water supply through periods of drought. Water supply systems are also at risk from uncertainties such as forest fires, failure of dams, mains, and wells, and contamination of all or part of the raw water supply. The Steamboat Water Supply Plan identifies a forest fire as being a potential threat to the Fish Creek water supply that should be addressed. It further recommends that a Drought Response Plan be developed for the City and the District. A Community Wildfire Protection Plan has been developed for the area and the Forest Service has a wildfire management plan for the Fish Creek watershed.

In emergency or drought situations, contingency plans should be designed for implementation of mandatory measures in stages that minimize impacts to the economy, life-styles, and environment of the community. Plans should also be flexible in response to worsening or improving conditions.

7.2 Proposed Staged Water Use Restrictions

Adoption by the City Council and MWW District Board of the three-stage response plan outlined below is recommended. Adoption of this plan will authorize the Director of Public Works of the City and the General Manager of MWWD to declare Stage 2 and Stage 3 conditions and implement and enforce the drought response actions. Stage 1 will be in effect at all times.

7.2.1 Stage 1: The following recommended guidelines are in place at all times

- Potable water shall be used for beneficial purposes and should not be wasted.
- No outdoor watering 10AM – 6PM.
- When irrigating with a hose, use spring-loaded nozzle; no free-running hoses.
- Discourage tree-planting and the seeding or sodding of new lawns June 15th through August 31st.
- Encourage the use of native grasses and shrubs or drought-tolerant species on new or re-developing properties.
- Discourage water-intensive landscapes.
- Limit the filling of swimming pools to one per year, unless draining for repairs is necessary.

7.2.2 Stage 2: This stage will be triggered by a drought warning based upon:

*Water Conservation Plan II
Mount Werner Water & City of Steamboat Springs*

- April 1st SWE at the Tower SNOTEL site below 80% of average;
- an early run-off (before July 1) resulting in low flows in the Fish Creek Watershed;
- persistent higher than average temperatures within the period of April through August;
- below average precipitation within the period of April through August.

The following Stage 2 restrictions will be put into effect by Utility operators and will be mandatory in addition to the year-round recommendations in Stage 1:

- Watering schedule based on the last number of customer street address:

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Even	Odd	Even	No Watering	Odd	Even	Odd

- Permits may be secured for newly-sodded lawns and newly-planted trees for up to 14 consecutive days and for newly-seeded lawns for up to 25 consecutive days with the exception of Wednesdays.
- No vehicle washing at residences.
- No washing hard surfaces (i.e., driveways, sidewalks, parking lots, outdoor eating areas).
- No running outdoor water features (including those meeting MWW District specifications).
- No use of domestic water for dust control.

7.2.3 Stage 3: This stage will be triggered by a drought declaration or a water supply emergency caused by forest fire or failed infrastructure

The following mandatory restrictions go into effect in addition to Stage 1, Stage 2 restrictions:

- No lawn irrigation.
- Suspension of special watering permits including those for newly seeded or sodded lawns.
- Hand watering of trees, shrubs, and flowers, and drip irrigation of trees and shrubs is allowed.
- All businesses including hotels, restaurants and property management companies, will be required to implement Stage 3 water conservation measures including education of owners, tenants and guests.

The entities may impose a total ban on all outside water use in the event of an extreme water system emergency.

8.0 COST BENEFIT ANALYSIS, SCREENING AND SELECTION OF WATER CONSERVATION PLAN COMPONENTS

8.1 Master List of Water Conservation Measures & Programs

A master list of water conservation measures and programs was prepared for review and appears in Table 8.1. These were combined into categories to better define the type of program and allow a more integrated assessment of the potential benefits that may be derived from their implementation. The categories are as follows: Utility, Education, Rebates, and Audits.

The utility programs focus on improving efficiency of service, distribution, municipal operations and educating the customer base on water usage. These programs are primarily created and managed by water department staff and administrators. The main targets for the utility programs are to reduce the quantity of non-revenue water and to slow the demand for total produced water.

Education programs concentrate on water users and are geared towards reducing the water consumption in residential and commercial sectors. Education extends to all demographics and focuses on improving overall awareness.

Rebate programs, a third category, would provide financial incentives to customers who aim to improve the efficiency of water use in their home or business. These will encourage and support the retrofit of older and outdated appliances, equipment and technology.

The fourth category includes both residential and commercial audits. Through monitoring and field assessment water wasting issues would be identified and mitigated.

Initial screening of the 38 programs and measures listed below took place with district personnel in attendance (meeting September 13, 2010) using the prescribed criteria outlined below. Of these, 33 were furthered for cost benefit analysis. Some elements were eliminated or restructured and combined (U7, U8, U9, U12, U13, E3, E12, R5, and A1). Grey water reuse and rainwater harvesting never made initial list because of legal limitations placed on these activities in Colorado.

*Water Conservation Plan II
Mount Werner Water & City of Steamboat Springs*

TABLE 8.1 Conservation Programs/Measures - Master List for Initial Screening

Conservation Programs/Measures *	E x i s t i n g S S	E x i s t i n g M W I	E x i s t i n g S I I	Further Evaluati on	Further Evaluati on	Further Evaluati on	Comments
	Y / N	Y / N	Y / N	SS	MWW	SII	
U1. Leak detection	n	n	Y	y	Y	continue	-City - routine yes, Surveys no. City will consider once every 2 years. City plans to continue replacing pipe annually. -MWW plans to continue replacing pipe. -SBT actively looks for leaks via annual surveying (using sonar). Dig to it & repair.
U2. Distribution system Infrastructure repair /replacement & improvement	y	n	y	y	n	continue	-City looking at expanding wellfield. -92% of MWW water distribution system less than 40 years old. Principal activity is upsizing strategic water mains. Repair older mains as necessary. -SBT II evaluates every year e.g. 1,000 ft. this fall
U3. Tiered Rate Structure	y	y	Y	n	Y	y	-City likes current structure. -MWW will be doing base rate evaluation, looking at tighter tiers and lower thresholds -SBII will be reevaluating this fall (current structure dates to 1996)
U4. Meter enhancements /software	y	y	Y	continue	continue	continue & new	-City is moving to smart meters. Casselle billing software is utilized. Sensus meter reading software is utilized. -MWW is deploying Aclara system, currently at 50%.complete. -SBII upgrading from Badger to Sensus. Looking into new software
U5. Hydrant testing /monitoring	y	y	Y	continue	continue	continue	All do annual flushing, exercise valves, retrofitting of seats and valves.
U6. Bill stuffers	y	y	Y	y	Y	y	-City would like to enhance with new messages and promotional info monthly. Also do door hangers annually -MWW does newsletter quarterly with messages on statements as well. -SBII sends messages/newsletter quarterly. Will continue to enhance
U7. Billing Software Upgrades	y	n	Y	y	Y	y	-City will be upgrading. - MWW running Caselle 2.16, considering upgrade to Caselle Clarity version. -SBII is upgrading

*Water Conservation Plan II
Mount Werner Water & City of Steamboat Springs*

Conservation Programs/ Measures *	E x i s t i n g S S	E x i s t i n g M W I	E x i s t i n g S I	Further Evaluati on	Further Evaluati on	Further Evaluati on	Comments
U8. Water restrictions	n	n	Y	y	N	y	-All are considering adopting drought related restrictions Everyday water restrictions not in place; will be incorporated in drought response section of WC plan.
U9. Commercial/Industrial Standards (new construction)	n	n	n / a	n	N	n	As there is no problem with water delivery, it is felt that no need exists.
U10. Decorative Water Features Standards (new construction)	n	y	n / a	n	Y	n	-MWW restricts fountains and other decorative outdoor water use
U11. Park irrigation monitoring	y	n / a	Y	y	N	continue	-City is planning to do an audit of city parks. Also looking into converting from watering with treated water to raw water with water rights (e.g. Soda Creek, Butcher Knife, Springs Creek) -MWW has none. -SBII 1.5 million gallons goes to parks.
U12. Irrigation requirements	n	n	N	n	N	n	Not needed, no authority. Irrigation and hose code has size limitation, not enforced.
U13. High efficiency fixture & appliance requirements beyond standard code (new residential construction)	y	y	Y	n	N	n	-City has voluntary code for green building which extends across all 3 districts. No enhancements planned in foreseeable future due to the poor economy
U14. Meter testing and replacement	n	n	Y	n	N	y	-City, within next 3 years will replace every meter in system - MWW responds to erratic meter readings and replaces as necessary. MWW deploying Aclara wireless meter reading system. -SBII has program planned to replace Badger to Sensus
U15. Designate water conservation officer	n	n	N	y	Y	y	All 3 districts are beginning a phased in program over time as budget allows, starting with responding to complaints which are minimal.
U16. Drought & emergency preparedness plan	y	y	Y	y	Y	y	Plan is to have all district bodies adopt the drought & emergency preparedness plan as part of the W/C plan.

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Conservation Programs/ Measures *	E x s t i n g S S	E x i s t i n g M W	E x i s t i n g S I	Further Evaluati on	Further Evaluati on	Further Evaluati on	Comments
							-MWW has some components in place as does SBII
U17. Form Water Suppliers Group	n	n	n	y	Y	y	-And also include other districts
U18. Newsletters	y	y	Y	continue	continue	continue	
E1. Website enhancements	y	y	N	y	continue	maybe	Add ET info, etc. -MWW evaluating online billing/payment -SBII doesn't have a website
E2. Training for professional irrigators & landscapers	n	n	N	y	?	?	There is a real need for educating irrigators and landscapers, these is a need to look for grant monies to implement.
E3. Residential kit distribution	D i d i n p a s t	n	N	n	N	n	-most homes are retrofitted
E4. Irrigation / Xeriscape information (best practices, rain sensors, efficient spray heads, ET irrigation guidelines)	n	n	N	y	Y	y	-Need residential training on how to set/adjust, when and how often to water, install water efficient/saving components
E5. Youth (school, scouts, etc.) programs	n	y	N	?	continue	?	-MWW conducts tours for grades 3-4. Other programs to be considered if grant money becomes available.
E6. General public education programs -how to read bill -why monitor usage -benefits of behavior changes	y	y	Y	y	Y	y	All would like to consider enhancements as staff and budget/grants become available

*Water Conservation Plan II
Mount Werner Water & City of Steamboat Springs*

Conservation Programs/ Measures *	E x s t i n g S S	E x i s t i n g M W W	E x i s t i n g S I I	Further Evaluati on	Further Evaluati on	Further Evaluati on	Comments
-website (practices/ savings, xeriscaping, plant list, ET irrigation info, etc.							
E7. Annual public open house: product info and availability	y	y	N	?	?	?	Did one in 2009, not good turnout. Possibly look partnering with demonstration trailer, home and garden show, and/or other events.
E8. Lodging Property education	n	y	n / a	n	Y	n/a	Work is being done by MWW and SBP and should be enhanced if grant funds become available- part of rebate 50/50 program
E9. Commercial/ Industrial education -Sustainable Biz program coordination	y	y	n / a	y	Y	n/a	Plan to continue, however could enhance with grant funds
E10. HOA program	n	y	n / a				Needed, however grant funding will be necessary.
E.11 Seminars & demonstrations targeted to professionals and/or businesses	y	y	n	?	?	?	Need grant money - Focus on irrigation and big users e.g.
E.12 Agricultural -collaborate with existing organizations	n	n	N	n	N	n	No opportunity here
R1. Toilet replacement incentive	n	n	N	y	Y	y	Would like to look into with grant assistance on a 50/50 basis: 2 nd after irrigation
R2. Clotheswasher replacement incentive	n	n	N	y	Y	y	3 rd priority
R3. Dishwasher replacement	n	n	N	y	Y	y	4 th priority
R4. Irrigation	n	n	N	y	Y	y	1 st priority

*Water Conservation Plan II
Mount Werner Water & City of Steamboat Springs*

Conservation Programs/ Measures *	E x i s t i n g S S	E x i s t i n g M W	E x i s t i n g S W I	Further Evaluati on	Further Evaluati on	Further Evaluati on	Comments
enhancement incentives							
R5. Commercial rebate program	n	n	N	n	N	n	Not applicable – focus on education
A1. Commercial audits	n	n	N	n	N	n	No funding
A2. Residential audits	n	y	N	?	continue	?	-MWW offers free residential audits w/ few takers
A3. Irrigation audits	n	n	N	y	Y	n	-City is planning on doing these as is MWW

*Legend of Abbreviations
 E = Education Programs
 R = Rebate Programs
 U = Utility Programs
 A = Audit Programs

A description for programs and measures from the initial master list prior to screening appears below.

Utility

U1. Leak Detection: The Leak Detection/Investigation program is the investigation of leaks within the distribution main lines. This is site specific and is based on suspecting a leak due to water rising to the surface and requires listening at valves and hydrants to determine a leak. With mountainous topography and high pressure zones, almost all leaks surface in a relatively short time frame. Employing sensor based technologies remains a possibility in the future.

U2. Distribution system Infrastructure repair /replacement & improvement: Distribution System Infrastructure Repair and Replacement is an ongoing Capital Improvement Project (CIP) for both Districts. The target goal is to replace or repair 1,000 linear feet of water pipeline a year in each district.

U3. Tiered Rate Structure: Tiered Rate Structure is a billing mechanism that requires customers who consume more water to pay more. In both districts the tiered rate structure for water billing applies to residential customers only. For the City, there is a base rate and then five classes of water volumes with each increased level, an increased price per 1,000 gallon. MWW, includes a base rate and three tiers for water volume with the highest tiers’ revenue specifically allocated to conservation. This billing structure will

continue into the future with planned rate increases every year at the City. MWW may also have to raise rates in the future to accommodate infrastructure improvement costs.

U4. Meter enhancements /software: The Meter Enhancement program is a Capital Improvement Project. The City plans to convert approximately all 3,000 taps to Smart meters, over the next 3 years. MWW is retrofitting existing meters and has already completed two-thirds of all meters, leaving 574 meters per year for the next two years.

U5. Hydrant testing /monitoring: Hydrant Flushing is a unique program because there is actually no anticipated water savings. Hydrants are tested annually which involves releasing unmetered water in order to flush hydrants and test valves. The amount of water used will most likely remain the same, unless newer flushing techniques become available and provide an opportunity for water savings. However, by improving the monitoring of how much water is released through recordkeeping both districts will be better able to quantify the amount of non-revenue water.

U6. Bill stuffers: Bill Stuffers is a proposed program that involves developing informative inserts to be included with customer billings and/or separate mailings to customers. This is an educational opportunity, providing customers with tips on how to read the bill, why they should conserve water, and how. This has occurred to some extent in the past, but has not been an on-going program. The goal for this program is 10 year duration with quarterly messages.

U7. Billing Software Upgrades: This measure involves upgrading current utility billing software by purchasing a newer, more advanced software version. The intent of this upgrade is to increase software capabilities, improve account information retrieval and provide access to other vital tools that will improve the billing clerk's ability to track customer usage.

U8. Water restrictions: Revising and adopting codes that address water usage allowance and place restrictions on type of use, frequency and duration. This would affect all residences and business within the City limits.

U9. Commercial/Industrial Standards – new construction: This measure would require working with the planning and building departments to develop changes in the existing building code that promote water conservation and efficient technology/equipment for new commercial construction.

U10. Decorative Water Features Standards (new construction): Decorative Water Features Standards is applicable for MWW district only (not an issue within City). The focus will be on education and discouraging outdoor water features altogether, possibly through a change or set of disincentives in the building code. Lodging properties will be targeted. The cost benefit analysis projects restricting one fountain per year.

U11. Park Irrigation Monitoring: This program includes evaluating water usage at City-owned/operated parks, fields and irrigated areas by performing landscape irrigation

audits. System inefficiencies are identified and recommendations are made to improve system performance. This includes parks in both water districts, will take place over 10 years, and targets 5 landscape irrigation audits per summer.

U12. Irrigation requirements: Revising and adopting codes that specify irrigation restrictions and requirements. This would affect all residences and business within the City of Steamboat Springs.

U13. High efficiency fixture & appliance requirements: Revising and adopting codes that improve the standards for new construction by requiring water conservation appliances and fixtures. This would be an enhancement to the existing guidelines set forth in the International Building Code (IBC). This would affect all new construction taking place within the City of Steamboat Springs.

U14. Meter testing and replacement: Meter monitoring is an on-going program which requires the identification and replacement or repair of non-functioning meters. The lifespan of this program is 10 years and is a reactive, not proactive approach to fixing broken meters. Approximately only 5 meters a year are identified and repaired, however all known broken meters are and will continue to be addressed immediately.

U15. Designate water conservation officer: This program would result in the designation of a staff person to oversee water conservation issues, record and respond to complaints or inquires about water wasting, provide water conservation recommendations, enforce water restrictions and assist with educating users on water saving measures. Quantifying water savings that would result in creating this position is difficult, however, the potential exists for significant savings. Creation of a permanent water conservation position is intended to be a good start towards the development of a conservation culture within the customer base.

U16. Drought & emergency preparedness plan: The Drought and Emergency Preparedness measure is enacting the elements of the plan when a drought situation is imminent. This program would only go into effect after analysis of prescribed snowpack/water levels. The anticipated duration of a drought program is 2 years. The water savings is significant, but would only be realized in an emergency.

U17. Form Water Suppliers Group: Forming a Water Suppliers Group involves joining the local and regional water supply and distribution providers together to: allow for better coordination; merge water conservation efforts; share information about water savings program successes and challenges; and combine resources for water conservation and drought response programs.

U18. Newsletters: The basis of this program is to develop annual or semi-annual newsletters and distribute them to customers, aiming to educate them on the importance of water conservation as well as discuss program updates, water supply initiatives, capital infrastructure improvements and other relevant topics and issues faced by the water/sewer utilities. MWW already distributes quarterly newsletters with the water bill.

U19. Raw Water Conversion for Irrigation: This measure involves the conversion of municipal irrigation systems from filtered water to raw water. The City is primarily looking at irrigated space along Yampa river tributaries where there is a possible opportunity to obtain or utilize a water right. This requires a feasibility study and site analysis along with engineering and design for a pump station, diversion structure, and upgraded irrigation system. This new program will have construction costs and potential added operations and maintenance costs. An interdepartmental effort between Public Works and Parks, Recreation and Open Space and would be necessary to implement the program.

Education

E1. Website Enhancements: Website enhancements involves updating district websites with pertinent and current utility information as well as providing resources such as fact sheets, water savings calculators, water saving tips and evapo-transpiration irrigation guidelines for our climate. This website would be useful in rebate program administration, advertising programs and promoting events.

E2. Training for professional irrigators & landscapers: This is a proposed education program that will target irrigation system designers and installers and provide them with updates and training on design and installation using best available technology and equipment.

E3. Residential kit distribution: Distributing a kit with tools and devices that assist home owner in responding to water wasting issues.

E4. Irrigation / Xeriscape information: Irrigation / Xeriscape information is a program that provides education on best practices, rain sensors/ shut offs, efficient spray heads, and ET irrigation guidelines. This will potentially be combined with a rebate program. The information will be targeted to both residential and commercial property owners with a focus on lodging properties and large irrigation users.

E5. Youth (school, scouts, etc.) programs: Youth Programs are proposed education initiatives that would target K-8 school age water users, currently of which there are 1,200 in Steamboat Springs public schools.

E6. General public education programs: Education programs that target general public/ municipal water customers by providing advice and assistance in understanding water bills, conveying the importance of monitoring usage and demonstrating benefits of behavior changes. It may involve events, distribution of materials, and partnering with suppliers in the region.

E7. Annual public open house: This program would allow for the creation of an annual public event in conjunction with commercial or non-governmental partners to raise awareness of water conservation technology, appliances, rebates, local availability, etc.

E8. Lodging property education: This is a proposed education program targeted to lodging properties and homeowner associations, some of the largest users in the MWW district. Rebates may also be incorporated.

E9. Commercial/ Industrial education: This is a proposed education program targeted to commercial customers. The program as analyzed would partner with the Steamboat Sustainable Business Program and/or work with business owners/managers to identify ways to improve water efficiency within the business. Commercial audits and rebates may be included as a compliment to this initiative.

E10. HOA program: This is a proposed education program targeted to lodging properties and homeowner associations, which constitute some of the largest users in the MWW district. Rebates may also be incorporated.

E.11 Seminars & demonstrations targeted to professionals and/or businesses: This is the development and implementation of seminars & demonstrations targeted to professionals and/or businesses. Those groups include architects, planners, landscape design companies, plumbers and developers.

E.12 Agricultural: The goal of this program would be to facilitate communication with agricultural water users, collaborate with existing organizations, and work cohesively to conserve water in the Yampa River basin.

Rebate

R1. Toilet replacement incentive: The goal of this program is to encourage residents to replace toilets 3.5 gallons and greater with EPA recognized WaterSense brands, high-efficiency toilets (maximum flush 1.28 gallons), dual flush toilets, or other approved fixtures. The funds would be administered on a first come first served basis with both districts' customers being eligible.

- **Commercial Toilet Replacement Incentive:** This program consists of identifying qualified recipients in the community, through the Sustainable Business Program, or by business owners applying and showing a need for a toilet upgrade. The program would offer \$150 to offset the cost of a Water Sense toilet. The goal is to replace 25 commercial toilets a year, for five year duration. This rebate program is not retroactive and must first be approved by The City of Steamboat Springs or MWW official due to limited funding.
- **Residential Toilet Replacement Incentive:** This program would allow residents who qualify to receive a \$100 to offset the cost of a Water Sense toilet. The goal is to replace 100 residential toilets per year, for five year duration. This program would operate on a first come, first served basis until the 100 toilets for the year have been replaced.

R2. Residential Clothes Washer replacement incentive: This program will provide financial incentives to residents who upgrade their existing clothes washers to Energy Star and/or Water Sense certified appliances. To qualify the machine being replaced must be over 10 years old. The program would be for five year duration, offering per year \$100 rebates for 75 new washing machines. This program would operate on a first come, first served basis.

R3. Residential Dishwasher replacement: This program will provide financial incentives to residents who upgrade their existing dishwasher to a water saving appliance. To qualify the machine being replaced must be over 8 years old. The program would be for a five year duration, offering per year \$75 rebates for 50 new dishwashers. This rebate program is not retroactive and must first be approved by a City of Steamboat Springs or MWW official due to limited funding. This program would operate on a first come, first served basis.

R4. Irrigation enhancement incentives: This program will provide financial incentives to people who upgrade their existing irrigation equipment. The program would be for five year duration, offering per year \$75 rebates for 100 individual residents for rain sensors and efficient spray heads. This program would operate on a first come, first served basis and requires proof of purchase and an affidavit proving installation. The City would administer funds but both districts customers would be eligible.

R5. Commercial rebate program: This program will provide financial incentives to business or Home Owner Associations who upgrade their existing irrigation equipment. The program would be for a five year duration, offering per year \$1000 rebates for 5 individual properties for rain sensors and efficient spray heads. This rebate program would include an on site consultation to determine deficient areas and provide recommended upgrades.

Audits

A1. Commercial Audits: Commercial water use audits would be provided to help business owners understand where their water goes and how to develop a plan to reduce consumption.

A2. Residential audits and A3. Irrigation Audits:

- **Indoor Residential Audits:** This is a monitoring and response program to address anomalies in customer water usage. For example, as the billing software program detects abnormally high water use, a water technician would contact the customer to assess the situation. If there was no obvious cause for excessive water use, the technician would do an on-site assessment to determine if there is a problem, like a potential leak.
- **Outdoor Residential Audits:** If the above audit reveals an outdoor problem, a “broad brush” outdoor audit would be triggered including checking spray heads,

looking for broken or misaligned nozzles, determining overspray, etc. Recommendations would be made.

8.2 Screening and Selection Process

Water Conservation Measures and Programs were screened using the following procedure:

STEP 1: Create Master List of Conservation Measures and Programs

STEP 2: Preliminary Screening:

Along with water district representatives, review the master list and apply the following criteria:

-Is it already being done?

If yes:

-Has it been successful?

-Does it need updating/enhancements?

-Should it be continued?

If no:

-Is there interest?

-Supported by Board? Public?

-Is there budget to implement?

-Is it one time or ongoing?

-Can it be administered by staff? By outside party?

-Grant monies available?

-How will savings be measured?

-Short Term?

-Long Term?

STEP 3: For those measures and programs that are advanced through preliminary screening, scrutinize for cost benefit analysis:

-How much water will be saved?

-How will it affect the \$ bottom line?

-Does it have good potential for success? Legal barriers? Technology issues?

-Does the expense justify the savings?

STEP 4: Selection for implementation:

-Rank the selected measures/programs according to effectiveness, cost and potential for success

-Will the water conservation goals be met with the selected measures/programs?

STEP 5: Monitor list annually and make necessary adjustments. Are savings being achieved? What is the actual cost?

8.3 Cost Benefit Analysis

An extensive cost benefit analysis was performed on those items which were advanced through step 2 above. Detailed worksheets for each measure or program appear in the Appendix. A master spreadsheet summarizing findings was prepared (Table 8.2).

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TABLE 8.2 Cost Benefit Analysis Summary

For the following charts please refer to color key.

	City of Steamboat Springs
	Mount Werner Water
	Both Water Districts

	A	B	C	D	E	F	G	H	I	J	K	L
		1	2	3	4	5	6	7	8	9	10	11
	Conservation Measure or Program	Planning Period (number of years)	One time labor & material cost	# of Participants per year	Gallons saved per unit per year	Estimated Annual Water Savings (gallons)	Estimated Total Water Savings Over Planning Period	Annual Revenue Loss	Estimated Annual Cost	Estimated Total cost over planning period	Cost per 1000 gallons saved	Rank
4	City of Steamboat Springs											
5	Mount Werner Water											
6	Both Water Districts											
7	Removed											
8												
9												
10												
11	U1. Leak detection/ Investigation CITY	10	\$0	5280 (ft.)	135	711,397	7,113,970	N/A	\$71,400	\$714,000	\$100.37	8
12	U1. Leak detection/ Investigation MWW	10	\$0	5280 (ft.)	101	578,004	5,780,040	N/A	\$71,400	\$714,000	\$123.53	8
13	U2. Distribution system Infrastructure repair /replacement & improvement CITY	10	\$0	5280 (ft.)	135	710,684	7,106,839	N/A	\$267,000	\$2,670,000	\$375.69	*
14	U2. Distribution system Infrastructure repair /replacement & improvement MWW	10	\$0	5280 (ft.)	101	533,941	5,339,408	N/A	\$346,000	\$3,460,000	\$648.00	*
15	U3. Tiered Rate Structure CITY	10	\$0	3,000	2,110	6,330,000	73,865,000	\$34,372	\$11,350	\$113,500	\$1.79	*
16	U3. Tiered Rate Structure MWW	10	\$0	3,000	2,852	8,476,170	99,335,530	\$18,902	\$10,425	\$104,250	\$1.23	*
17	U4. Meter enhancements /software CITY	3	\$50,000	1,000	10,137	10,137,000	30,411,000	\$55,044	\$231,500	\$794,500	\$26.13	*
18	U4. Meter enhancements /software MWW	2	\$0	574	8,031	4,610,000	9,220,000	\$10,280	\$94,787	\$189,575	\$41.12	*
19	U5. Hydrant testing /monitoring	10	\$0	N/A	N/A	0	N/A	N/A	\$1,110	\$11,100	N/A	⊖
20	U5. Hydrant testing /monitoring	10	\$0	N/A	N/A	0	N/A	N/A	\$1,110	\$11,100	N/A	⊖
21	U6. Bill stuffers	10	\$0	6,000	2,038	12,225,875	146,710,500	\$66,387	\$2,080	\$20,800	\$0.06	2
22	U10. Decorative Water Features Standards (new construction)	10	\$250	\$1.00	754,560	754,560	7,545,600	\$1,683	\$350	\$3,500	\$0.46	4
23	U11. Park irrigation monitoring	5	\$500	5	219,562	1,097,810	5,489,051	\$4,205	\$3,125	\$16,125	\$2.85	3
24	U12. Irrigation requirements											
25	U13. High efficiency											
26	U14. Meter Monitoring	10	\$0	5	9,600	48,000	480,000	N/A	\$11,901	\$119,010	\$247.94	*
27	U14. Meter Monitoring	10	\$0	5	9,600	48,000	480,000	N/A	\$13,005	\$130,050	\$270.94	*
28	U15. Designate water conservation officer	10	\$0	3,000	703	2,110,000	21,100,000	\$11,457	\$7,187	\$71,875	\$3.41	7
29	U15. Designate water conservation officer	10	\$0	3,000	942	2,825,390	28,253,900	\$6,301	\$8,250	\$8,250	\$2.92	7
30	U16. Drought & emergency preparedness plan	3	\$0	6,000	10,033	60,200,000	180,600,000	\$230,566	\$4,275	\$12,825	\$0.08	*

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	A	B	C	D	E	F	G	H	I	J	K	L
28	U17. Form Water Suppliers Group	10	\$0	6,000	163	978,070	9,780,700	\$3,746	\$2,450	\$24,500	\$2.50	6
29	U18. Newsletters	10	\$0	6,000	8	48,904	489,040	\$187	\$925	\$9,250	\$18.91	5
30	U.19 Raw water conversion for Irrigation	10	\$20,000	1	3,000,000	3,000,000	30,000,000	\$11,490	\$52,750	\$527,500	\$17.58	1
31	E1. Website enhancements	10	\$0	3,000	7	21,100	211,000	\$115	\$802	\$8,020	\$38.03	1
32	E1. Website enhancements	10	\$0	3,000	9	28,254	282,540	\$63	\$750	\$7,500	\$26.55	1
33	E2. Training for professional irrigators & landscapers	10	\$0	20	516,000	10,320,000	103,200,000	\$39,526	\$2,950	\$29,500	\$0.29	7
34	E3. Residential kit distribution											
35	E4. Irrigation / Xeriscape information (best practices, rain sensors, efficient spray heads, ET irrigation schedules)	10	\$0	20	23,442	468,844	4,688,440	\$1,796	\$4850 Labor and materials/ \$11,500 Rebates	\$48,000 L&M/ 115,000	\$34.87	5
36	E5. Youth (school, scouts, etc.) programs	10	\$1,000	Need age group target	2,037	1,222,588	47,680,913	\$4,805	\$2,300	\$24,000	\$0.50	8
37	E6. General public	10	\$0	6,000	82	489,035	4,890,350	\$1,873	\$1,850	\$18,500	\$3.78	3
38	E9. Commercial/Industrial education	10	\$0	15	219,000	3,285,000	32,850,000	\$12,582	\$5,450	\$54,500	\$1.66	6
39	E10. HOA program/Lodging Property Education(E8) and A1	10	\$0	10	1,026,100	10,261,000	102,610,000	\$22,882	\$8,850	\$88,500	\$0.86	2
40	E.11 Seminars & demonstrations targeted to professionals and/or businesses	10	\$0	25	195,614	4,890,350	48,903,500	\$18,730	\$2,025	\$20,250	\$0.41	4
41	E.12 Agricultural											
42	R1a. Commercial Toilet replacement incentive	5	\$4,275	25	32,882	822,071	4,110,355	\$3,149	\$7,393	\$40,743	\$8.99	3
43	R1b. Residential Toilet replacement incentive	5	\$4,275	100	1,956	195,614	978,070	\$749	\$14,375	\$76,150	\$73.49	2
44	R2. Clotheswasher replacement incentive	5	\$4,275	75	6,800	510,000	2,550,000	\$1,953	\$10,781	\$58,180	\$21.14	1
45	R3. Dishwasher replacement	5	\$4,275	50	1,872	93,600	468,000	\$358	\$7,031	\$39,431	\$75.12	6
46	R4a. Irrigation enhancement incentives	5	\$4,275	100	3,110	311,040	1,555,200	\$1,191	\$12,505	\$66,800.00	\$40.20	4
47	R4b. Commercial (HOA) Irrigation enhancement incentives	5	\$4,275	5	707,328	3,536,640	17,683,200	\$13,545	\$9,651	\$52,531	\$2.73	5
48	R5. Commercial rebate program											
49	A1. Commercial audits											
50	A2. Indoor Residential audits CITY	10	\$4,275	75	6,000	450,000	4,500,000	\$2,444	\$6,018	\$60,187	\$13.38	1
51	A2. Indoor Residential audits MWW	10	\$4,275	75	6,000	450,000	4,500,000	\$1,004	\$5,625	\$56,250	\$12.50	1
52	A3. Outdoor Residential Audits-CITY	10	\$2,750	20	2,074	41,472	414,720	\$225	\$1,605	\$16,050	\$38.70	2
53	A3. Outdoor Residential Audits-MWW	10	\$1,525	20	2,074	41,472	414,720	\$92	\$5,100	\$51,000	\$122.97	2

Notes: The number of taps is used in the “participants” column where appropriate (a value of 3,000 for each district was utilized). For U1 and U2 1 mile was used to estimate costs, however realistically each district will not perform these programs for more than 1,000 ft per year and not necessarily that amount per year for 10 years. MWW only replaces pipe based upon need.

Revenue Loss

Costs of conservation measures cited in columns 8 and 9 of Table 8.2 do not include the amounts shown in the revenue loss column. Some programs will not result in revenue loss as the water being “saved” constitutes a non-metered loss that is not being billed or paid for. It is important to note that although some revenue will be lost when billed water is conserved, an indirect cost benefit results from deferring large capital expenditures to add filtration bays and/or to expand sewerage treatment plant capacity. For example, a \$2 million dollar revenue loss is still better than a \$5 million dollar facility expansion cost. Further, cost savings associated with reduced operational costs will be realized as a result of reducing water demand and subsequent water produced (such as energy savings).

TABLE 8.3 Estimated Costs of Measures and Programs

Cost Estimates for All Measures and Programs

Conservation Measure or Program	Estimated Annual Cost	Estimated Total cost over planning period	Cost per 1000 gallons saved
U1. Leak detection/ Investigation	\$71,400	\$714,000	\$100.37
U1. Leak detection/ Investigation	\$71,400	\$714,000	\$123.53
U2. Distribution system Infrastructure repair /replacement	\$267,000	\$2,670,000	\$375.69
U2. Distribution system Infrastructure repair /replacement	\$346,000	\$3,460,000	\$648.00
U3. Tiered Rate Structure	\$11,350	\$113,500	\$1.79
U3. Tiered Rate Structure	\$10,425	\$104,250	\$1.23
U4. Meter enhancements	\$231,500	\$794,500	\$26.13
U4. Meter enhancements	\$94,787	\$189,575	\$41.12
U5. Hydrant testing /monitoring	\$1,110	\$11,100	N/A
U5. Hydrant testing /monitoring	\$1,110	\$11,100	N/A
U6. Bill stuffers	\$2,080	\$20,800	\$0.06
U10. Decorative Water Features Standards (new construction)	\$350	\$3,500	\$0.46
U11. Park Irrigation Monitoring	\$3,125	\$16,125	\$2.85
U14. Meter Monitoring	\$11,901	\$119,010	\$247.94
U14. Meter Monitoring	\$13,005	\$130,050	\$270.94
U15. Designate water conservation officer	\$7,187	\$71,875	\$3.41

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U15. Designate water conservation officer	\$8,250	\$8,250	\$2.92
U16. Drought & emergency preparedness plan	\$4,275	\$12,825	\$0.08
U17. Form Water Suppliers Group	\$2,450	\$24,500	\$2.50
U18. Newsletters	\$925	\$9,250	\$18.91
U.19 Raw water conversion for Irrigation	\$52,750	\$527,500	\$17.58
E1. Website enhancements	\$802	\$8,020	\$38.03
E1. Website enhancements	\$750	\$7,500	\$26.55
E2. Training for professional irrigators & landscapers	\$2,950	\$29,500	\$0.29
E4. Irrigation / Xeriscape information	\$4850 Labor and materials/ \$11,500 Rebates	\$48,000 L&M/ 115,000	\$34.87
E5. Youth (school, scouts, etc.) programs	\$2,300	\$24,000	\$0.50
E6. General public education programs	\$1,850	\$18,500	\$3.78
E9. Commercial/ Industrial education	\$5,450	\$54,500	\$1.66
E10. HOA program/Lodging Property Education(E8) and A1	\$8,850	\$88,500	\$0.86
E.11 Seminars & demonstrations targeted to professionals and/or businesses	\$2,025	\$20,250	\$0.41
R1a. Commercial Toilet replacement incentive	\$7,393	\$40,743	\$8.99
R1b. Residential Toilet replacement incentive	\$14,375	\$76,150	\$73.49
R2. Clothes washer replacement incentive	\$10,781	\$58,180	\$21.14
R3. Dishwasher replacement	\$7,031	\$39,431	\$75.12
R4a. Irrigation enhancement incentives	\$12,505	\$66,800	\$40.20
R4b. Commercial (HOA) Irrigation enhancement incentives	\$9,651	\$52,531	\$2.73
A1. Commercial audits			
A2. Indoor Residential audits	\$6,018	\$60,187	\$13.38
A2. Indoor Residential audits	\$5,625	\$56,250	\$12.50

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A3. Outdoor Residential Audits	\$1,605	\$16,050	\$38.70
A3. Outdoor Residential Audits	\$5,100	\$51,000	\$122.97

Table 8.4 Water Savings Estimates for Measures and Programs

Savings Estimates for All Measures and Programs		
Conservation Measure or Program	Estimated Annual Water Savings (gallons)	Estimated Total Water Savings Over Planning Period (gallons)
U1. Leak detection/ Investigation	711,397	7,113,970
U1. Leak detection/ Investigation	578,004	5,780,040
U2. Distribution system Infrastructure repair /replacement	710,684	7,106,839
U2. Distribution system Infrastructure repair /replacement	533,941	5,339,408
U3. Tiered Rate Structure	6,330,000	73,865,000
U3. Tiered Rate Structure	8,476,170	99,335,530
U4. Meter enhancements	10,137,000	30,411,000
U4. Meter enhancements	4,610,000	9,220,000
U5. Hydrant testing /monitoring	0	N/A
U5. Hydrant testing /monitoring	0	N/A
U6. Bill stuffers	12,225,875	146,710,500
U10. Decorative Water Features Standards (new construction)	754,560	7,545,600
U11. Park Irrigation Monitoring	1,097,810	5,489,051
U14. Meter Monitoring	48,000	480,000
U14. Meter Monitoring	48,000	480,000
U15. Designate water conservation officer	2,110,000	21,100,000
U15. Designate water conservation officer	2,825,390	28,253,900
U16. Drought & emergency preparedness plan	60,200,000	180,600,000
U17. Form Water Suppliers Group	978,070	9,780,700

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U18. Newsletters	48,904	489,040
U.19 Raw water conversion for Irrigation	3,000,000	30,000,000
E1. Website enhancements	21,100	211,000
E1. Website enhancements	28,254	282,540
E2. Training for professional irrigators & landscapers	10,320,000	103,200,000
E4. Irrigation / Xeriscape information	468,844	4,688,440
E5. Youth (school, scouts, etc.) programs	1,222,588	47,680,913
E6. General public education programs	489,035	4,890,350
E9. Commercial/ Industrial education	3,285,000	32,850,000
E10. HOA program/Lodging Property Education(E8) and A1	10,261,000	102,610,000
E.11 Professional Training	4,890,350	48,903,500
R1a. Commercial Toilet replacement incentive	822,071	4,110,355
R1b. Residential Toilet replacement incentive	195,614	978,070
R2. Clothes washer replacement incentive	510,000	2,550,000
R3. Dishwasher replacement	93,600	468,000
R4a. Irrigation enhancement incentives	311,040	1,555,200
R4b. Commercial (HOA) Irrigation enhancement incentives	3,536,640	17,683,200
A1. Commercial audits		
A2. Indoor Residential audits	450,000	4,500,000
A2. Indoor Residential audits	450,000	4,500,000
A3. Outdoor Residential Audits	41,472	414,720
A3. Outdoor Residential Audits	41,472	414,720

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TABLE 8.5 Totals for all Listed Measures and Programs

Water Conservation Program Type	Estimated Annual Water Savings (gallons)	Estimated Annual Cost	Percentage
Utility	115,423,805	\$1,212,380	0.75
Education	30,986,171	\$24,977	0.20
Rebates	5,468,965	\$61,736	0.04
Audits	982,944	\$18,348	0.01
Total	152,861,885	\$1,317,441	100
% of Total Produced Water	0.16		

Although cost per 1,000 gallons saved was not the only selection consideration, overall cost effectiveness is certainly desirable during the ranking process. It is not surprising that the measures that appear to be most effective are ones that require little labor and materials costs and reach a larger number of people. The top ten programs that are the most cost effective, meaning the least amount of dollars per 1,000 gallons saved are displayed on the Table below.

TABLE 8.6 Top 10 Most Cost Effective Programs

Conservation Measure or Program	Cost per 1000 gallons saved
U6. Bill stuffers	\$0.06
U16. Drought & emergency preparedness plan	\$0.08
E2. Training for professional irrigators & landscapers	\$0.29
E.11 Seminars & demonstrations targeted to professionals and/or businesses	\$0.41
U10. Decorative Water Features Standards (new construction)	\$0.46
E5. Youth (school, scouts, etc.) programs	\$0.50
E10. HOA program/Lodging Property Education(E8) and A1	\$0.86
U3. Tiered Rate Structure MWW	\$1.23
E9. Commercial/ Industrial education	\$1.66
U3. Tiered Rate Structure CITY	\$1.79

Note: E4 was combined with R4, inflating the cost and precluding this measure from making the list.

8.4 Final Selection

Based upon the results of the cost benefit analysis and consideration of screening criteria, measures were ranked as follows:

TABLE 8.7 Recommended Ranking by Category
Utility Programs & Measures

Ranking	Program Name
*	U2. Distribution system Infrastructure repair /replacement & Improvement CITY
*	U2. Distribution system Infrastructure repair /replacement & improvement MWW
*	U3. Tiered Rate Structure CITY
*	U3. Tiered Rate Structure MWW
*	U4. Meter enhancements /software CITY
*	U4. Meter enhancements /software MWW
*	U16. Drought & emergency preparedness plan
*	U18. Newsletters-MWW
*	U14. Meter monitoring
1	U.19 Raw water conversion for Irrigation
2	U6. Bill stuffers
3	U11. Park irrigation monitoring
4	U10. Decorative Water Features Standards (new construction)
5	U18. Newsletters-CITY
6	U17. Form Water Suppliers Group
7	U15. Designate water conservation officer
8	U1. Leak detection/ Investigation CITY
8	U1. Leak detection/ Investigation MWW
⊖	U5. Hydrant monitoring/quantifying
Moved to E13	U12. Irrigation requirements
Moved to E13	U13. High efficiency fixture & appliance requirements beyond standard code (new residential construction)

* *In progress but might need enhancements or CIP financing.*

Education Programs & Measures

Ranking	Program Name
1	E1. Website enhancements
2	E10. HOA program/Lodging Property Education(E8) and A1
3	E6. General public education programs and Annual Event
4	E.11 Seminars & demonstrations targeted to professionals and/or businesses
5	E4. Irrigation / Xeriscape information (includes rebate)
6	E9. Commercial/ Industrial education
7	E2. Training for professional irrigators & landscapers
8	E5. Youth (school, scouts, etc.) programs
9	E.13 Community Development Code revisions
Moved to Rebate section	E3. Residential kit distribution
Removed	E.12 Agricultural

Many of these programs have been started, this ranking is prioritizing how we want to start enhancements to existing program.

Rebate Programs

Ranking	Program Name
1	R2. Clothes washer replacement incentive
2	R1b. Residential Toilet replacement incentive
3	R1a. Commercial Toilet replacement incentive
4	R4a. Residential Irrigation enhancement incentives
5	R4b. Commercial Irrigation enhancement incentives
6	R3. Dishwasher replacement

Audit Programs

Ranking	Program Name
1	A2. Indoor Residential audits CITY
1	A2. Indoor Residential audits MWW
2	A3. Outdoor Residential audits CITY
2	A3. Outdoor Residential audits MWW
Moved to E9	A1. Commercial audits (added to E9)

Most of the programs on the Master List were selected for implementation in some fashion, some being combined and others becoming a blend of desired components. Very few programs/measures were completely rejected. The ones that were rejected lacked feasibility of implementation (legal or public support) or the ability to affect water

savings (for example rain harvesting and greywater reuse are not legally allowable in our region).

An important component of implementation is the ability to secure outside funding through grants and other mechanisms. In the case of the City, pressure from governing boards to significantly reduce expenditures makes it difficult to adjust budgets to allocate for new projects and programs. Often Capital Improvement Projects are budgeted but funds are not allocated. Priorities may also change from a City-wide perspective, potentially precluding funding for programs recommended in this plan. Mount Werner Water is a special utility district and therefore has more flexibility and control of their funds, however is managed by a fiscally conservative board and is subject to meeting their financial objectives as well.

9.0 WATER CONSERVATION IMPLEMENTATION PROGRAM

9.1 Implementation Plan

Based upon the analysis in section 8, it is realistic in the current economic climate to implement the following water conservation components. It should be noted that rebate programs and certain other capital projects would only be feasible if grant funds are awarded. The programs discussed below are intended to be implemented within the planning period identified in this Plan.

Table 9.1 Implementation Plan
Continue existing programs including enhancements:

Item	Annual Water Savings	Current Program Cost	Funding Source
➤ Distribution system, infrastructural repair/replacement U2	1,244,625	\$613,000 annually	Capital Improvement Program (CIP) or Bond
➤ Tiered rate structure (City & MWW) U3	14,806,170	\$21,775 annually	Operation (O&M) Budget (built into rate structure)
➤ Meter enhancements/software (City & MWW) U4	14,747,000	\$326,287 3 years City 2 years MWW	CIP
➤ Drought & emergency preparedness U16	0-60,200,000 (only implemented if drought)	\$4,275 variable	O&M
TOTAL	90,997,795		

Result: 9% savings of total water produced (if drought year stage 3), or 3% not factoring in the drought preparedness restrictions

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2011 and Beyond:

Item	Annual Water Savings	Program Cost	Duration	Fund Source
➤ Website enhancements E1	49,354	\$1,552	Annually	O&M
➤ Bill stuffers U6	12,225,875	\$2,080	Annually	Grant
➤ Park irrigation monitoring (City) U11	1,097,810	\$3,125	Annually 5 parks/yr	O&M
➤ Raw water conversion for irrigation (City) U19	3,000,000	\$52,750	Annually over 5 years	Grant & O&M
➤ HOA and Lodging Property Program (MWW) E10	10,261,000	\$8,850	Annually	MWW O&M
➤ Appliance and/or irrigation component rebate programs R1-R4 with residential & commercial audits as necessitated	5,468,965	\$61,738*	355 rebates over 1 year	Grant
➤ Hydrant flushing quantification U5	0	\$2,220	Annually	O&M
➤ Meter testing U14	96,000	\$24,906	Annually	O&M
➤ Annual public education event E6	498,135	\$1,850	Annually	Grant
TOTALS	32,697,139			

*would require grant funds

Result: 3% savings of total water produced

Add one program per year starting in 2012 from list below

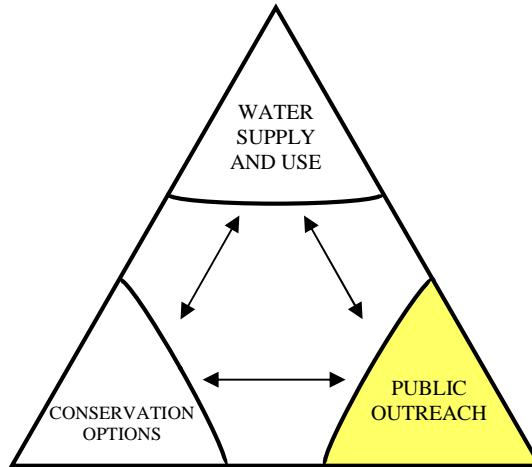
- Irrigation education E4
- Irrigation training E2
- Indoor and Outdoor residential audits A2&3
- Commercial education (partnering with Steamboat Sustainable Biz Program) E9

System Loss Reduction Goals

As outlined in Section 3, the estimated system loss for the City is 19.9% and MWW 12%. Losses that are due to distribution system leakage, metering inaccuracies, unmetered use and non-metered park irrigation would be addressed by implementing U1, U2, U4, U14,

U11 and U19. Currently, approximately 156 million gallons per year (MG/Yr), or 16% of produced water, is lost from the system. A target has been set to reduce this loss by 58 million gallons to 98 MG/yr by the year 2035. Grant funds would be needed to implement some of these programs.

10.0 PUBLIC OUTREACH – ESTABLISHING A WATER CONSERVATION CULTURE AND TRACKING PROGRAM EFFECTIVENESS



10.1 Establishing a Dialogue

As mentioned in previous sections of this Plan, to be successful and effective, water suppliers must effectively develop and communicate water conservation messages to the public in order to initiate the process of developing a water conservation culture in the community.

Effective communication requires the effort of all stakeholders including users, water suppliers and local governments. Further, this communication should not be one-way. Water suppliers and local governments must listen and learn and engage residents and business owners in an exchange of views and ideas. Periodic feedback to the community on meeting goals will validate programs and energize participation

Coordination of actions and conveying a consistent message among community water suppliers is also crucial to effective communication within the community to avoid confusing the public. An example is the “oasis effect” whereby the customers of one supplier are perceived to be using more water than the customers of a neighboring supplier. For this reason, regional water suppliers should form a Community Water Suppliers Group. This would include the managers from the City of Steamboat Springs, Mount Werner Water, Steamboat II, and Tree Haus as well as smaller water suppliers such as Dakota Ridge, Priest Creek, and Alpine Mountain Ranch.

The community water suppliers group would

- develop and adopt a uniform set of conservation policies;
- implement these policies uniformly in their respective jurisdictions;
- coordinate media communication of these policies to their customers.
- develop a plan for enforcement in case mandatory emergency measures are enacted.

It is essential that area residents and business owners understand the water conservation program. They need assurance that all service area customers are participating in this program.

△ Customers. All customers will need to understand why water conservation is beneficial to the community. The media will be one of the best means to inform the public about the conservation program.

△ Homeowners' associations and neighborhood organizations. Water supplier managers will meet with property managers to encourage HOA's and neighborhood associations to adopt responsible water use policies and practices, particularly with regard to landscaping.

△ Architects, landscape designers, landscapers, plumbers, and developers. Water suppliers should actively communicate new policies regarding water fixtures, landscape design, irrigation systems, and water features.

△ Local government. Elected government officials, City and County managers and staff, and Metropolitan District Directors and Managers need to know about possible impacts on residents. The City Council and respective boards of the Metropolitan Districts will be provided in-depth information to support their deliberations and decision-making processes. Local governments and public agencies should lead the way and be the first to show a willingness to implement conservation measures, while maintaining public health and safety.

△ Water supplier employees. Opportunities to train Water Supplier employees as "water ambassadors" may also be incorporated into the public outreach program.

Involving the Public in Developing Water Conservation Measures

Meetings of the water suppliers group, City Council and MWW District board provide forums in which to present and exchange views and ideas regarding water conservation policies and measures. Often, however, targeted audiences are not in attendance. Additional outreach efforts are necessary to effectively get the message out.

Monitoring Drought Conditions

If drier than normal conditions exist, public interest in drought potential will develop quickly. It will be important to communicate to the community that water suppliers are monitoring conditions closely. The community should know that water suppliers are prepared to address the situation. Even if dry conditions do not eventually lead to a drought declaration for the community, water suppliers need to be prepared with

consistent information to field queries from the media, customers, and area visitors. Water suppliers will also need to develop and adopt a uniform Drought Response Plan which outlines how to implement the more aggressive measures of a Stage 3 declaration.

10.2 Suggested Measures for Public Outreach

- ❖ Form a Water Suppliers Group comprised of representatives from all water supply entities.
- ❖ Adopt a set of uniform conservation messages.
- ❖ Allocate funds for media messaging and public outreach efforts.
- ❖ Raise community awareness by publicizing conservation messages through a media campaign.
- ❖ Encourage public discussion on water use priorities and ways to conserve water.
- ❖ Publish a “water waste reduction” brochure for households and aggressively promote it.
- ❖ Contact high-volume commercial and institutional water users to solicit their ideas and support.
- ❖ Publicize efforts of individuals and business customers as examples. Work with entities such as the Steamboat Sustainable Business Program to support ongoing efforts.
- ❖ Encourage government entities to demonstrate leadership by conducting water audits on their facilities and large irrigated public areas and by implementing water conservation measures; publicize the results.
- ❖ Report regularly to the public during the irrigation season and document results annually.
- ❖ Host or participate in “green” community events.

10.3 Metrics and Measurement of Implemented Programs

An important component of this program is providing feedback to the community as well as to governing bodies on the effectiveness of water conservation measures and progress made toward targets.

The greatest conservation gains may be made in the area of irrigation practices because most customers practice some form of irrigation during the summer months. Small behavioral changes can also have a significant impact.

Other metrics to track might include;

- rebate usage;
- implementation of new code changes;
- tracking the number of attendees at water conservation workshops, seminars, and events;
- reporting infrastructure improvements including pipe replacement, meter upgrades, etc.;
- tracking wireless transponder meter data;

- improved measurement of reduced loss and reduced demand (e.g. hydrant flushing quantification);
- business and property management participation in the commercial water conservation programs;
- website “hits”.

Annual reports will be prepared and will detail the cost benefit and effectiveness as well as tracking efforts of the various programs that are implemented. Additionally, a better understanding of water usage and water losses will be obtained as the programs become more sophisticated, resulting in improved resource management.

10.4 Plan Adoption Procedure

In 1991 the Colorado Water Conservation Act, C.R.S.§37-60-126, went into effect, creating the Office of Water Conservation and Drought Planning (OWCDP) and requiring entities that supply 2,000 acre-feet or more of water annually to develop, adopt, make publicly available, and implement a water conservation plan. Plans must be submitted to the Colorado Water Conservation Board (CWCB) which has developed guidelines that are required to be met prior to their approval.

While the City and MWW each fall below this 2,000 acre-foot threshold, together they supply 3,000 acre-feet to their combined constituencies through a shared water supply system. Accordingly, the two entities desire to be proactive and have committed to partner to meet the mandate. This joint water conservation plan is the result of that partnership.

In April of 2009, the first Water Conservation Plan for the Steamboat Springs community, including the City and MWW was finalized. Both the City Council and the MWW Board embraced the Plan. The draft Plan was presented publicly to the City Council on April 14, 2009 and to the MWW Board in May, 2009. Additionally, the public was invited to a Water Conservation Open House on May 27th where exhibits explaining the Plan and implementation objectives as well as a presentation were made. No negative responses were received as a result of this process. The Plan was also submitted to the CWCB, not for formal approval, but for feedback.

In May of 2010, this Plan, Water Conservation Plan II, with the generous funding assistance provided by the CWCB, was embarked upon with the intention of gaining CWCB Plan approval and subsequent implementation assistance.

A 60 day public comment period to solicit additional public input will commence in December of 2010. The Colorado Water Conservation Program requires that Water Conservation Plans go through a public process prior to their approval including making the draft plan available, providing public notice, and soliciting comment for at least 60 days. The public will be notified via news media and other means. The Plan is scheduled for review by the City Council on January 18, 2011 and by the MWW Board on January 20, 2011.

11.0 CONCLUSION – DESIRED OUTCOME

This plan is intended to be a living document which will be revisited periodically. The CWCB requires adopted plans to be updated a minimum of every 7 years.

Progress reports relative to program costs, successes and challenges will be prepared annually.

It is intended that the public continue to be apprised of progress as part of this water conservation plan implementation process.

APPENDIX A – EXISTING WATER CONSERVATION EFFORTS

The City and the Districts have recognized the importance of water conservation and see their responsibility as promoting changes in attitude towards the daily use of water by residents, businesses and visitors alike. Small changes in behavior over a long period of time can have large impacts.

Customer Outreach

In the Mount Werner District, managed residential properties are the largest users of water in the Districts (70%) followed by commercial (20%) and other residential (10%). All indications are that most of our customers are trying to conserve water.

Since 2002, Mount Werner Water has increased its efforts to work with customers to conserve water. Efforts have included:

- Instructing homeowners in efficient landscape irrigation.
- Visiting houses to conduct water audits and to instruct on water-saving practices.
- Hosting Middle-School children at the Filtration Plant to introduce them to the community's water system and conservation practices.

In 2006, the MWW launched the following conservation initiatives:

Managed Residential customers (70% of usage)

The MWW District launched a water conservation certification program with property managers to persuade their client homeowner associations to adopt landscaping policies and practices consistent with responsible water use. To date there are six property management companies participating covering 40 residential complexes and 1,686 residential units as well as ten commercial complexes.

Residential customers (10% of usage)

The MWW District has developed a doorhanger leaflet with irrigation tips which is distributed by the local Boy Scout Troop each June. The District also highlights conservation tips in its quarterly newsletter mailed in early July.

Commercial customers (20% of usage)

The MWW District encourages hotel and motel owners to place conservation messages in guest rooms. The large resort hotels in the base area already employ this guest messaging. In 2006, the District sourced tent cards and placards from Project Planet and placed them in six area motels and provided the managers with information about how to source additional messaging materials. Many motels do not employ in-room messaging because of the high turnover rate in guest rooms.

School Program

Each spring and fall, the MWW District hosts Middle School children at the Fish Creek Filtration Plant where they learn about where our community water comes from and how to use it responsibly.

Conservation Policy

In 2007, the Board of Directors amended the MWW District's Rules and Regulations

- 1) to regulate the size and consumption of water features in landscape design;
- 2) to raise the tap fee charged for irrigated areas.

Economic Incentives

In January, 2007, the MWW District introduced tiered water rates. It also re-balanced the cost of service between residential and commercial classes and eliminated the monthly volume allowance.

- For residential users, the District employs a tiered structure which increases the rate for discretionary outdoor uses. Irrigation meters are charged at the second tier discretionary rate.
- For commercial users, the new rates averaged a 28% increase.

City of Steamboat Springs Current Conservation Activities

- i. Adoption of the 2003 International Plumbing code
- ii. Educational door hanger and Message Inserted in water bill about conservation
- iii. Water conservation information on websites
- iv. Water efficient landscape design workshops
- v. Host middle school tours of Wastewater Treatment Plant and Water Filtration Plant
- vi. *Liquid Assets*: Public viewing with panel of experts
- vii. Water Conservation Recognition and Certification Program

All of the current conservation activities have been well received by the general public and are successful in bringing awareness to water use and conservation. Quantifying the amount of water saved is difficult to determine because each activity has a different focus and impact on the community. All of these educational and out reach programs have been well received by the community, schools and individuals. With many in attendance, it is determined that these efforts are successful in the intended goal of bringing more awareness and empowerment about conservation to water users. However it can be concluded that more people are becoming conscious about their water consumption.

Overall the main challenges we are experiencing is adequate personnel designated to the current programs in order to enhance them to the fullest, reaching the water users who are not engaged in civil events and tracking the water savings for each effort. The challenges we face involve reaching people who are less civically minded and not as receptive to conservation initiatives

Narrative Descriptions

- i. To address single family homes indoor water usage, all three districts encourage retrofitting older fixtures to more efficient models through the adoption of the 2006 International Plumbing Code. This requires all new construction to install water saving fixtures. This being required more homes are water efficient and therefore setting a standard that cannot be changed. This is a positive step towards improving efficiency in homes. Challenges are enforcing this on an individual level, however most all fixtures are water conscience and more home buyers are demanding them in design or when purchasing new homes.
- ii. To reduce outdoor usage in the single and multi family homes an educational door hanger and bill inserts are distributed annually with water bill. At this point we have not determined the success of the hanger and bill inserts and haven't seen a noticeable water use change since the distribution.
- iii. To educate the public and continue community outreach we created water conservation pages on the City of Steamboat Springs and MWW websites, which include water conservation tips, drought tolerant plant lists and a variety of water conservation sources.
- iv. In 2009 we held a water efficient landscape design workshop coordinated by the private sector at their monthly Sustainable Business Luncheon. We also facilitated the creation of a xeriscape demonstration garden at a City of Steamboat Springs owned property in conjunction with a local non-profit environmental education group, Yampatika.
- v. To involve the schools, MWW hosts middle school students at the filtration plant to introduce them to the water system and conservation, while the City provides WWTP tours to elementary school students.
- vi. In an effort to engage the average citizen we facilitated the public viewing of the PBS film, *Liquid Assets*, with panel of water experts available for questions and answers. This community event spawned discussion relating to public water infrastructure and conservation of resources.
- vii. The main water conservation program currently in place is a property management Water Conservation Recognition and Certification Program. This program focuses on bringing awareness of water usage to property managers and their Home Owner Associations. There are 12 components of the certification with 10 of those focusing on outdoor practices, since summer water usage is where dramatic water use increases occur. Managed properties in the MWW District comprise 68-75 percent of the residential units and therefore consume a large majority of water. Focusing on these properties is essential to reduce summer usage. The program has been in effect for several years now in the MWW District and is well received by the participants. Each property is certified at one of three levels: Bronze, Silver and Gold. To achieve Bronze certification, a property must display compliance with at least five of the above standards. To achieve Silver certification, a property must display compliance with at least seven standards. Compliance with nine

standards will result in Gold certification. The success of this program comes from generating awareness, providing education and continuing to enroll new properties into the program. The program has grown ever year since its creation in 2007, with the participants all striving to achieve a gold standard. The focus of this program is outdoor use for managed properties. One of the challenges of expanding the program into the City of Steamboat Springs water service area is the limited number of managed properties with outdoor water use; however we plan to enroll them in the program this year. Another challenge of this program is ensuring adequate communication between the property managers and their respective boards.

Steamboat Springs Chamber Resort Assn. Sustainable Business Program

To date, 78 businesses have participated in the Sustainable Business Program, one of the most accredited, diverse and encompassing programs of its kind in Colorado. Established in March of 2007 as a collaborative effort between the Steamboat Springs Chamber Resort Association and local consulting firm Environmental Solutions Unltd, the Sustainable Business Program has been changing the nature of business in the Yampa Valley. The program focuses on sustainability and the Triple Bottom Line - a new way to define business success. The Triple Bottom Line includes: financial success, social responsibility, proactive environmental management, and the inter-relationships between them. Our goal is to leave our planet in as good or better shape for future generations.

As part of the program, Environmental Solutions Unltd provides professional sustainable business coaching as well as a format for networking, sharing of ideas and practices, and for channeling collective energies amongst the business community that further the goal of achieving sustainability and a vibrant, economically sound community.

APPENDIX B - REFERENCES

Steamboat Springs Water Supply Plan, Nov. 2008 (Stantec)

Water and Wastewater Master Plan Updates, Steamboat Springs, December 2009
(McLaughlin Water Engineers, LTD)

Colorado Water Conservation Board website

AWWA website

A Water Conservation Master Plan for the Eagle River Water & Sanitation District
(Draft) developed by the Upper Eagle Regional Water Authority (Bauer, 2006)

Drought Response Plan - Denver Water

Realizing the Benefits from Water Conservation, Maddaus, W.O., Maddaus Water
Management, Alamo, CA

WATER, Use Less, Save More by Jon Clift and Amanda Cuthbert

US Environmental Protection Agency - Water Sense Program and Energy Star websites

Colorado State University website

Handbook of Water Use and Conservation, Vickers, Amy

Town of Windsor, CO Water Conservation Plan

Water and Wastewater Master Rate Study, Steamboat Springs, 2010 (Red Oak
Consulting)

Final Technical Memorandum No. 86-68210-SCA0-01, Summary of SMA Controller
Water Savings Studies, U.S. Department of the Interior, April 2008

Town of Aurora, CO Water Conservation Plan

Austin Texas Water Conservation website

Town of Evans Water Conservation Plan

APPENDIX C – WATER RATES

**MOUNT WERNER WATER AND SANITATION DISTRICT
SCHEDULE OF FEES AND CHARGES**

Effective 1 January 2009

**RESIDENTIAL
CUSTOMERS**

Quarterly charge/unit	Volume	Base
Water Service ¹	Tier I : 0 to 95 cubic meters = \$0.23 / m ³	\$21.84
	Tier II : 96-420 cubic meters = \$0.40 / m ³	
	Tier III : over 420 cubic meters = \$0.81 / m ³	
Residential Irrigation Meter ²	(see note 2)	none
Wastewater Service ³	(\$8.82 collection + \$31.77 treatment = \$40.59)	\$40.59

**COMMERCIAL
CUSTOMERS**

Quarterly charge/unit	Volume	Base
Water Service ¹	Over 0 m ³ = \$0.32 / m ³	\$21.84
Commercial Irrigation Meter	Over 0 m ³ = \$0.40 / m ³	None
Wastewater Service ³	1st and 4th quarters – \$0.90 per m ³ of actual water use (\$0.20/ m ³ collection + \$0.70/ m ³ treatment = \$0.90/ m ³) 2nd and 3rd quarters – \$0.90 per m ³ of average winter consumption (average of 1st and 4th quarter water use) (\$0.20/ m ³ collection + \$0.70/ m ³ treatment = \$0.90/ m ³)	None

NOTES:

1. Customers combining both residential and commercial units will be billed the water volume charges proportionately based upon square footage allocated to residential and commercial uses.
2. Residential irrigation meter flow for one single family dwelling shall be combined with the house meter flow and the Tier rates applied. Residential irrigation meter flow for all other residential units including irrigation meters for common areas

appurtenant to a multiple housing common community development shall be charged at the Tier II rate.

3. Effective April 1, 2009, the City of Steamboat Springs raised wastewater treatment charges 50% for Special Connectors.
Customers combining residential and commercial units will be billed the greater of the two methods for wastewater charges: by unit or by volume of water used.
4. All wastewater treatment charges collected by the District are passed through to the City of Steamboat Springs.
5. 1 cubic meter (1 m³) equals 264.17 gallons

**OTHER FEES AND CHARGES
Effective 1 January 2009 through 2010**

Bulk water fee: \$1.75 per 1000 gallons

Labor Rates:

- Regular work hours (8 am to 5 pm, Monday through Friday): \$41.83/hour
- All other hours: \$62.75/hour with a minimum 2 hour charge

Superintendent Rates:

- Regular work hours (8 am to 5 pm, Monday through Friday): \$52.05/hour
- All other hours: \$78.07/hour with a minimum 2 hour charge

City of Steamboat Springs – 2010 Rates and Charges

Each water consumer shall be billed for water service on a monthly basis for water usage on the premises. Each sewage works user shall pay a monthly service fee determined as follows.

Residential

Water Base Charge \$15.00 per month

Sewer Base Charge \$26.88 per month

Water Volume Rate

1,000-4,000	\$1.58 per 1000 gal
5,000-12,000	\$2.37 per 1000 gal
13,000-20,000 Sewer Volume Rate	\$3.63 per 1000 gal
21,000-28,000	\$4.73 per 1000 gal
29,000 +	\$7.10 per 1000 gal

Sewer Only Base Charge
\$26.88 per month

Commercial

Water Base Charge \$19.50 per month
Sewer Base Charge \$23.61 per month

Water Volume Rate
\$4.17 per 1000 gal

Sewer Volume Rate
\$4.97 per 1000 gal of water used

An average volume from October-March is used to bill April-September sewer volume

Sewer Only Base Charge
\$23.61 per month

COMBINED USAGE (Residential & Commercial Combined Properties)

Water

Base - \$19.50 per month
Volume - \$4.17 per 1000 gal

Sewer

\$23.61 + the greater of \$26.88 x # of res. units OR \$4.97 x water volume.

Billing Method:

Fee for turning water on.

Every water user shall pay to the city the sum of twenty-five dollars (\$25.00) for every time the water is turned on and/or is disconnected, except that there shall be no such charge in the case where a new tap is being installed or for pipeline repairs or initial construction. (c) In addition to the sum set forth above, every water user shall pay to the city a deposit equal to the sum of the two (2) highest months of usage within the last twelve (12) months to turn on water service when the water was disconnected due to non-payment or delinquency. Such deposits may be applied by the city to future charges, or shall be refunded to the property owner after one year of continuous timely payment.

Discounts and reimbursements.

(a) *Water charge discounts.* The monthly charges for water service to a private dwelling, apartment, condominium unit or any other single-family dwelling unit occupied by a family meeting the eligibility criteria established below shall be discounted to one-half (1/2) of the charge, as set out in section 25-216. The rate charged for turning water on to these same units shall be discounted to one-half (1/2) of the regular rate, as set out in section 25-217. Nothing stated herein shall be construed as allowing a discount for wastewater service charges. The wastewater rate shall be as set forth in section 25-218, with no rate discounts. For purposes of this section, the terms "dwelling unit" and "family" shall be defined as set forth in section 26-402.

(b) *Application for discount; duration.* Discount rates will take effect in the month following initial application to the city. The discount rate for families eligible under the elderly or non-elderly criteria as set forth in subsections 25-223(c) and (d) will remain in effect for one year; provided, that no discount rate will remain in effect after discontinuation of service, a change in the name of the billing, or any change in the status of the family or dwelling, and specifically for families eligible under the non-elderly criteria, the discontinuation of income support payments and changes in family income, which affects eligibility for the discount. Families eligible under criteria as set forth in subsections (c) and (d) may reapply yearly for continuation of the discount, and reapply to keep the discount rate

in effect. Members of families receiving discount rates shall notify the city upon any change in status of the family or dwelling, which might affect eligibility for the discount.

(c) *Elderly eligibility criteria.* A family is eligible for the discount rate under elderly criteria if the member named on the billing is sixty-two (62) years of age or older, the head of household, occupies the service address as his/her principal or primary place of residence, receives from all sources as a household an annual income equal to or less than the Low Income Adjusted Income Limit as published annually by the Farmer's Home Administration/HUD for Routt County, and makes application to the city pursuant to subsection 25-223(b).

(d) *Non-elderly eligibility criteria.* A family is eligible for a discount rate under non-elderly criteria if it meets both of the following requirements:

(1) The member named on the billing is receiving and will indefinitely continue to receive regular monetary income support payments from a private or public source for blindness, long term disability or indigency. Such payments include but are not limited to: social security, supplemental security income, aid to families with dependent children, disabled veterans payments, state social services general income support payments and private disability pensions. Such payments do not include nondisability retirement pensions, workmen's compensation, unemployment compensation or other forms of in-kind services, cost reimbursements, nonmonetary support, or any other form of assistance which is directed toward a specific need other than general income support.

(2) Total family income from all sources for the last twelve (12) months is the same or less than one hundred thirty (130) percent of the current poverty levels established by the U.S. Community Services Administration for non-farm families and in effect at the time of application or reapplication.

(e) Reserved.

(f) *Reimbursement of sewer charges for dwelling units.* One-half of the charges, as set out in section 25-218, for a private dwelling, apartment, condominium unit or any other single-family dwelling unit meeting the eligibility requirements as outlined in subsections (b), (c) and (d) shall be reimbursed on a monthly basis to the customers eligible for the discount. Such rebate shall be made from the general fund of the city. Under no circumstances will any rebate be allocated from the wastewater fund. Nothing in this section shall be construed as allowing for a discount rate for wastewater service.

(Ord. No. 2016, § 1(Exh. A), 10-11-05)

Payment; delinquent accounts.

The charges established in this division shall be due and payable monthly, upon receipt. Accounts shall be deemed delinquent if payment is not received by the city within fifteen (15) days of the billing date. Accounts in arrears more than thirty (30) days shall bear interest at the rate of one percent per month until paid. Accounts in arrears more than sixty (60) days shall be posted for disconnection and charged a penalty of fifteen dollars (\$15.00) unless suitable arrangements have been made with the finance director for payment in full.

(Ord. No. 2016, § 1(Exh. A), 10-11-05)

Liability for charges; collection of unpaid charges.

(a) The owner of any property or premises served by the city's water or sewer system shall be held personally liable for any and all charges imposed under the provisions of this division, from the time such charges become due. Such charges shall become and remain a lien upon any such property or premises served thereby, until such charges are paid. Such charges may be collected from any owner by an action at law or in equity. Such action is to be in the name of the city and may be prosecuted in any court having jurisdiction. The action may be for the enforcement of the lien. Any such lien shall attach to any lot or building comprising the property or premises served by the water or sewer system, and shall extend to the whole of such buildings or lots on the premises thereby served.

(b) In addition to or alternatively to the remedies provided in subsection (a), if the charges are not paid when due, the city clerk may certify such delinquent charges to the county treasurer, to be placed upon the tax rolls for the current year, to be collected in the same manner as other taxes are collected, with ten (10) percent of the amount of such delinquency added thereto to defray the cost of collection. All laws of the state for the assessment and collection of general taxes and the enforcement of liens therefor, including the laws for the sale of property for delinquent taxes and the redemption of the property, shall apply.

(Ord. No. 2016, § 1(Exh. A), 10-11-05)

Delinquency as grounds for termination of water service.

*Water Conservation Plan
Mount Werner Water, City of Steamboat Springs*

In addition to the remedies provided in section 25-225, if the charges provided by this division are not paid when due, and the account is deemed delinquent as set forth in section 25-224, the water service to the premises or property affected by such delinquency may be turned off by the city with forty-eight (48) hours' notice to the owner or occupant of the property, by shutting off the water supply thereto or therefrom or in any other manner by which disconnection or discontinuance of such service can be reasonably accomplished. Subsequent request by the owner of the property or premises so affected for connection with the water system of the city shall be subject to the charge set forth in section 25-217; further, the city shall not make such connection until a utility permit is received pursuant to section 25-3 and all delinquent charges have been paid.
(Ord. No. 2016, § 1(Exh. A), 10-11-05)

The Mount Werner Water and Sanitation District and the Tree Haus District (districts) shall pay wastewater services charges as follows:

- (1) The districts shall pay for each residential wastewater user within their respective special district boundary a monthly service charge of ten dollars and fifty-nine cents (\$10.59) per dwelling unit.
- (2) The districts shall pay for each commercial wastewater user within their respective special district boundary a quarterly service charge in the amount of two dollars and sixty-seven cents (\$2.67) per thousand gallons of water used per quarter, provided, however that for the months of April through September the districts shall pay a quarterly charge for each commercial customer in the amount of two dollars and sixty-seven cents (\$2.67) per thousand gallons of the customer's average quarterly water use for the months of October through March of the preceding year.
- (3) For each commercial wastewater user that also contains residential units within the same structure, the districts shall pay the greater of:
 - a. An amount equal to the number of dwelling units times thirty-one dollars and seventy-seven cents (\$31.77); or
 - b. Two dollars and sixty-seven cents (\$2.67) per thousand gallons of water used. The greater amount per user shall be determined and remitted to the city quarterly.
- (d) The Steamboat II Metropolitan District (Steamboat II) shall pay wastewater services charges as follows:
 - (1) Steamboat II shall pay for each Residential wastewater user within its Special District Boundary a monthly service charge of \$6.77 per dwelling unit. Steamboat II shall pay for each commercial wastewater user within its special district boundary a quarterly service charge in the amount of two dollars and sixty-seven cents (\$2.67) per thousand gallons of water used per quarter, provided, however, that for the months of April through September the district shall pay a quarterly charge for each commercial customer in the amount of two dollars and sixty-seven cents (\$2.67) times the customer's average quarterly water use for the months of October through March of the preceding year.
 - (2) For each commercial wastewater user that also contains residential units within the same structure, Steamboat II shall pay the greater of:
 - a. An amount equal to the number of dwelling units times thirty-one dollars and seventy-seven cents (\$31.77); or
 - b. Two dollars and sixty-seven cents (\$2.67) per thousand gallons of water used. The greater amount per user shall be determined and remitted to the city quarterly.
 - (e) Additionally, charges for wastewater service may consist of additional surcharges as set forth in sections 25-219.
 - (f) New accounts or summer only accounts shall have charges estimated based on first month readings and other information available to the finance director. Commercial wastewater users may appeal to the finance director for application of average winter consumption or, an average summer consumption, or other suitable estimate if the user can show that billing based on current water use will result in unfair treatment a gross injustice. In all cases in which users of said wastewater system are not supplied with water from the city water system, the charge for use of the wastewater system shall be determined by the city manager.

(Ord. No. 2016, § 1(Exh. A), 10-11-05; Ord. No. 2216, § 1, 11-18-08; Ord. No. 2229, §§ 1, 2, 2-3-09)

APPENDIX D – METHODOLOGY FOR PROJECTIONS

Future Water Demand

In order to project future water demand two types of methods were employed. The first method is based on the Equivalent residential unit. The equivalent residential (EQR) unit method is another means of normalizing water demands. For communities like Steamboat, with a large transient population due to the resort nature of the community, it may provide a more accurate measure of historic and projected unit water demand. This method uses a “common denominator” approach, establishing a typical single family residence as one EQR, to equate water demands and wastewater flows for different user categories. For Steamboat Springs, an EQR is considered to be a three bedroom, 2 bathroom home up to 2,500 square feet and equates to a maximum day water demand of 600 gpd (Water and Wastewater Master Plan Updates, McLaughlin Water 2009).

Existing and projected EQR for the City, MWW and Steamboat II, are presented in the following table. By using the EQR method of evaluating existing and future flows, the number of EQR does not directly correlate to the number of taps. For example, there are currently approximately 3,500 taps within the City, but more than 5,000 EQR. When a multi-family building with 20 three bedroom/two bath units is connected to the City system, they purchase a single tap for the building, but are considered 20 EQR from a system demand standpoint. EQR comparison allows an accurate technique for assigning water usage in addition to tap size and square footage. (Water and Wastewater Master Plan Updates, McLaughlin Water 2009).

**Table 11-A
Existing and Projected EQR**

Entity	Existing EQR	Projected EQR	Total EQR
City	5,347	1,898	7,245
District	6,771	3,256	10,027
Steamboat	406	47	453
Total	12,524	8,868	21,578

(Water and Wastewater Master Plan Updates, McLaughlin Water 2009).

For this analysis all existing customer classes, for the City of Steamboat Springs, Mount Werner Water and Steamboat II are grouped into the following three categories; residential, combined and commercial. Residential customers are characterized as all types of residential development, including multifamily housing. Combined customers are defined as residential and commercial customers housed in a single structure served by a single service line. Commercial customers include all other types of customers that are neither residential nor combined. In the Mt. Werner Water District there are more than these 3 groups and therefore for analysis purposes the existing customer classes were regrouped into the three designated customer classes. The Residential customer class in the District includes multi-family complexes and Single family residences, Commercial remains ungrouped and Combined includes multi-family irrigation and municipal irrigation. Steamboat II only has one customer class which is residential. The following table displays the existing EQR values produced by the McLaughlin Report and extrapolates an amount for each customer class according to their water usage.

Approximate Number of Existing Units						
	City		MWW		SBT II	
Customer Class	% Water Use	Units	% Water Use	Units	% Water Use	Units

*Water Conservation Plan
Mount Werner Water, City of Steamboat Springs*

Commercial	32.8	1,754	25	1,693	0	0
Residential	60.8	3,251	68	4,604	100	406
Combined	6.4	342	7	474	0	0
Total Number of Units		5,347		6771		406

The *Steamboat Water Supply Master Plan* provided a detailed evaluation of the past and projected water use within both the City and the District. The average, maximum day and total demands per EQR established in that report are presented in the following tables.

Table 2-9. Projected Average Daily EQR Water Demand (gpd per EQR)

Year	City, gpd per EQR	District, gpd per EQR	Total, gpd per EQR
2004	232	231	232
2005	230	232	231
2006	241	241	241
2007	237	247	242
Average	235	238	237

Steamboat Water Supply Master Plan, Stantec, November 2008

Since the table above only included years 2004-2007 it is necessary to adjust the average total EQR to better reflect current use. Due to significant changes in the economy, lower tourism levels, increased unemployment, water rate increases and reduced occupancy the years 2008 and 2009 have seen a dramatic decrease. This has a direct affect on the average EQR value. Therefore this value was decreased by 12% from 237 to 209, which is what the utility has experience over the last 2 years in water consumption.

After review of the City’s present customer information, and the categories used for comprehensive planning, the customer base was analyzed using the following land use categories, together with assigned EQR values:

Type EQR Units

- Single Family Residence 1.00
 - Single Family Estate 1.50
 - Multi-Family (2 Bedroom) 0.85
 - Multi-Family (3 Bedroom) 1.05
 - Multi-Family (4 Bedroom) 1.25
 - Mobile Homes 1.00
 - Commercial 4.44/acre
 - Industrial 2.13
 - Parks/Open Space Site Specific
- (Water and Wastewater Master Plan Updates, McLaughlin Water 2009).

The customer classes used in this analysis are more general than the recommended EQR units listed above and so they were pared down to the following amounts.

	Tri District: Existing Combined EQR Units	EQR Factor	EQR Values	Total Gallons per day average	% of Total Water Use

*Water Conservation Plan
Mount Werner Water, City of Steamboat Springs*

Commercial	3,447	1.1	230	792,366	28%
Residential	8,261	1	209	1,726,603	66%
Combined	816	1	209	170,581	7%
Total number of Units	12524			2,689,549	

This table represents by customer class the total growth rate for EQR and the associated gallons per day needed to meet that demand. The produced water is calculated by applying a 15% increase because that is the average percent loss (3 districts). The projected future water demands are listed below. The growth rate assumptions are from Red Oak Water and Wastewater Master Rate Study (2010) and represent the best available data. The growth assumptions for the Steamboat Springs community are based on historical data. The utility grew at an average rate of 1.69% during the five-year period from 2003 through 2007. Growth has slowed from this rate during 2009 to approximately 0.4%. Red Oak worked with City staff to project annual growth for the 10-year study period.

Projected annual growth in equivalent residential units (EQRs) is as follows:

- 2010 – 0.10%
- 2011 – 0.40%
- 2012 – 0.80%
- 2013 through 2019 – 1.69%

Year	Comm ercial	Residenti al	Combin ed	Total	Comme rcial Total (gallons)	Residenti al Total (gallons)	Combine d Total (gallons)	Total Gallons per day	Total Gallons per year Demand	PRODUCED(15% increase due to loss) Gallons	Produce d (AF)
EQR	1.10	1.00	1.00								
	230	209	209								
2009	3,447	8,261	816	12,524	792,366	1,726,603	170,544	2,689,512	981,671,890	1,128,922,674	3,465
2010 (0.1% Total Growth Rate)	3,510	8,274	878	12,536	807,341	1,729,264	183,407	2,720,011	992,803,998	1,141,724,598	3,504
2011(0.4 % Total Growth Rate)	3,524	8,307	881	12,586	810,570	1,736,181	184,140	2,730,891	996,775,214	1,146,291,496	3,518
2012(0.8 % Total Growth Rate)	3,552	8,374	888	12,687	817,055	1,750,070	185,613	2,752,738	1,004,749,416	1,155,461,828	3,546
2013 (1.69% Total Growth Rate)	3,612	8,515	903	12,902	830,863	1,779,646	188,750	2,799,259	1,021,729,681	1,174,989,133	3,606
2014 (1.69% Total Growth Rate)	3,673	8,659	918	13,120	844,904	1,809,722	191,940	2,846,567	1,038,996,912	1,194,846,449	3,667
2015 (1.69% Total Growth Rate)	3,736	8,805	934	13,341	859,183	1,840,307	195,184	2,894,674	1,056,555,960	1,215,039,354	3,729
2016 (1.69% Total Growth Rate)	3,799	8,954	950	13,567	873,703	1,871,408	198,483	2,943,594	1,074,411,756	1,235,573,519	3,792

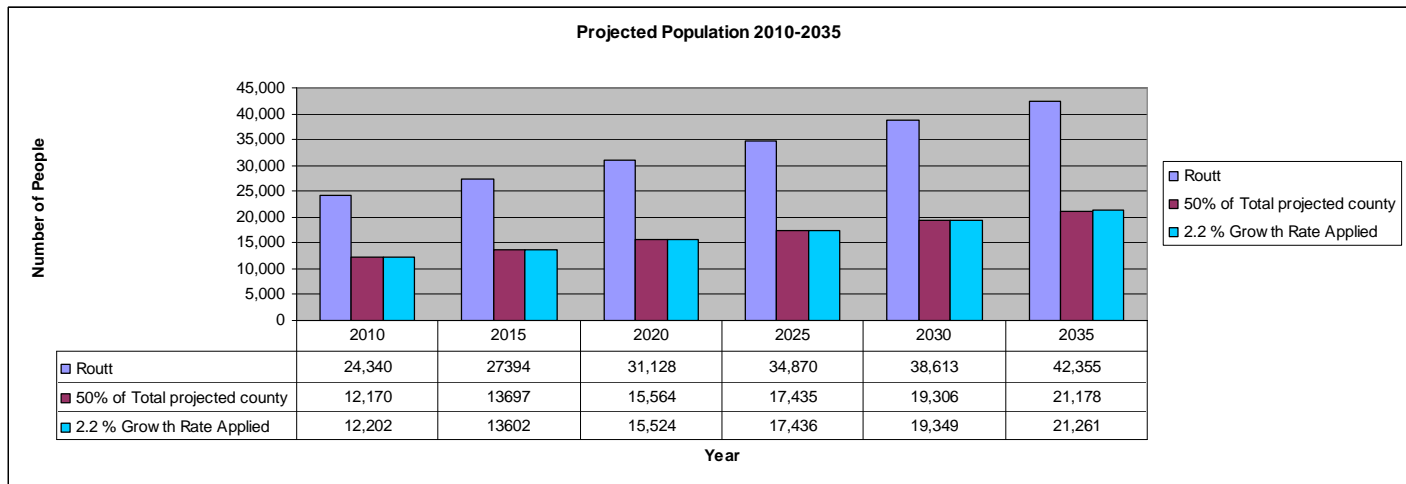
*Water Conservation Plan
Mount Werner Water, City of Steamboat Springs*

Growth Rate)												
2017 (1.69% Total Growth Rate)	3,863	9,105	966	13,796		888,469	1,903,035	201,837	2,993,341	1,092,569,314	1,256,454,712	3,856
2018 (1.69% Total Growth Rate)	3,928	9,259	982	14,029		903,484	1,935,196	205,248	3,043,928	1,111,033,736	1,277,688,796	3,921
2019 (1.69% Total Growth Rate)	3,995	9,416	999	14,266		918,753	1,967,901	208,717	3,095,370	1,129,810,206	1,299,281,737	3,987
2020 (2% Total Growth Rate)	4,074	9,604	1,019	14,552		937,128	2,007,259	212,891	3,157,278	1,152,406,410	1,325,267,372	4,067
2021 (2% Total Growth Rate)	4,156	9,796	1,039	14,843		955,871	2,047,404	217,149	3,220,423	1,175,454,538	1,351,772,719	4,148
2022 (2% Total Growth Rate)	4,239	9,992	1,060	15,140		974,988	2,088,352	221,492	3,284,832	1,198,963,629	1,378,808,174	4,231
2023 (2% Total Growth Rate)	4,324	10,192	1,081	15,442		994,488	2,130,119	225,922	3,350,528	1,222,942,902	1,406,384,337	4,316
2024 (2% Total Growth Rate)	4,410	10,396	1,103	15,751		1,014,378	2,172,721	230,440	3,417,539	1,247,401,760	1,434,512,024	4,402
2025 (2% Total Growth Rate)	4,499	10,604	1,125	16,066		1,034,665	2,216,176	235,049	3,485,890	1,272,349,795	1,463,202,264	4,490
2026 (2% Total Growth Rate)	4,589	10,816	1,147	16,388		1,055,358	2,260,499	239,750	3,555,608	1,297,796,791	1,492,466,309	4,580
2027 (2% Total Growth Rate)	4,680	11,032	1,170	16,715		1,076,466	2,305,709	244,545	3,626,720	1,323,752,727	1,522,315,636	4,672
2028 (2% Total Growth Rate)	4,774	11,253	1,193	17,050		1,097,995	2,351,823	249,436	3,699,254	1,350,227,781	1,552,761,948	4,765
2029 (2% Total Growth Rate)	4,869	11,478	1,217	17,391		1,119,955	2,398,860	254,425	3,773,239	1,377,232,337	1,583,817,187	4,861
2030 (2% Total Growth Rate)	4,967	11,707	1,242	17,738		1,142,354	2,446,837	259,513	3,848,704	1,404,776,984	1,615,493,531	4,958
2031 (2% Total Growth Rate)	5,066	11,942	1,267	18,093		1,165,201	2,495,774	264,703	3,925,678	1,432,872,523	1,647,803,402	5,057
2032 (2% Total Growth	5,167	12,180	1,292	18,455		1,188,505	2,545,689	269,997	4,004,192	1,461,529,974	1,680,759,470	5,158

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Rate)												
2033 (2% Total Growth Rate)	5,271	12,424	1,318	18,824		1,212,275	2,596,603	275,397	4,084,276	1,490,760,573	1,714,374,659	5,261
2034 (2% Total Growth Rate)	5,376	12,672	1,344	19,201		1,236,521	2,648,535	280,905	4,165,961	1,520,575,785	1,748,662,152	5,366
2035 (2% Total Growth Rate)	5,484	12,926	1,371	19,585		1,261,251	2,701,506	286,523	4,249,280	1,550,987,300	1,783,635,395	5,474

The Figure below displays the forecasted population of Routt County with the City of Steamboat Springs consistently contributing approximately 50% to the total County population. This data is produced by the Colorado State Department of Local Affairs (DOLA). Two methods were used for comparison purposes to generate projections for the City of Steamboat Springs. The first method applied the mean value of the annual percent change or 2.2%. The second method uses the portion of the County population that constitutes the City (49.85% from the years 2000-2008). Both methods produce similar results.



Source: DOLA: Population data/Routt.County

Using an estimate of gpcd, the following figures extrapolates projected population to water usage.

YEAR	Estimated Population(based on 50% of County)	Average Number of Gallons per day (210 gpcd)	Number of Gallons in a Year (Based on Average 210 GPCD)	Produced (Gallons)	Produced (AF)
2010	12,170	2,555,700	932,830,500	1,072,755,075	3,292
2011	12,369	2,597,490	948,083,850	1,090,296,428	3,346
2012	12,586	2,642,955	964,678,575	1,109,380,361	3,405
2013	12,949	2,719,185	992,502,525	1,141,377,904	3,503
2014	13,310	2,794,995	1,020,173,175	1,173,199,151	3,600
2015	13,697	2,876,370	1,049,875,050	1,207,356,308	3,705
2016	14,067	2,954,035	1,078,222,775	1,239,956,191	3,805
2017	14,441	3,032,628	1,106,909,038	1,272,945,393	3,907
2018	14,815	3,111,220	1,135,595,300	1,305,934,595	4,008
2019	15,190	3,189,813	1,164,281,563	1,338,923,797	4,109

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2020	15,564	3,268,405	1,192,967,825	1,371,912,999	4,210
2021	15,938	3,346,998	1,221,654,088	1,404,902,201	4,311
2022	16,312	3,425,590	1,250,340,350	1,437,891,403	4,413
2023	16,687	3,504,183	1,279,026,613	1,470,880,604	4,514
2024	17,061	3,582,775	1,307,712,875	1,503,869,806	4,615
2025	17,435	3,661,368	1,336,399,138	1,536,859,008	4,716
2026	17,809	3,739,960	1,365,085,400	1,569,848,210	4,818
2027	18,184	3,818,553	1,393,771,663	1,602,837,412	4,919
2028	18,558	3,897,145	1,422,457,925	1,635,826,614	5,020
2029	18,932	3,975,738	1,451,144,188	1,668,815,816	5,121
2030	19,306	4,054,330	1,479,830,450	1,701,805,018	5,223
2031	19,681	4,132,923	1,508,516,713	1,734,794,219	5,324
2032	20,055	4,211,515	1,537,202,975	1,767,783,421	5,425
2033	20,429	4,290,108	1,565,889,238	1,800,772,623	5,526
2034	20,803	4,368,700	1,594,575,500	1,833,761,825	5,628
2035	21,178	4,447,293	1,623,261,763	1,866,751,027	5,729

Both methods described above provide an estimate of the future water demands. The following chart shows the projected average day demand for both methodologies. The population based method using GPCD grows more rapidly over time than the EQR however the values are relatively close for each year. The difference between the two methods ranges from 10,441 to 207,323 gallons per day demand.

	EQR	GPCD	Difference
	Average Demand per day (Gallons)		
2010	2,720,011	2,555,700	164,311
2011	2,730,891	2,597,490	133,401
2012	2,752,738	2,642,955	109,783
2013	2,799,259	2,719,185	80,074
2014	2,846,567	2,794,995	51,572
2015	2,894,674	2,876,370	18,304
2016	2,943,594	2,954,035	-10,441
2017	2,993,341	3,032,628	-39,287
2018	3,043,928	3,111,220	-67,292
2019	3,095,370	3,189,813	-94,442
2020	3,157,278	3,268,405	-111,127
2021	3,220,423	3,346,998	-126,574
2022	3,284,832	3,425,590	-140,758
2023	3,350,528	3,504,183	-153,654
2024	3,417,539	3,582,775	-165,236
2025	3,485,890	3,661,368	-175,478
2026	3,555,608	3,739,960	-184,352
2027	3,626,720	3,818,553	-191,833
2028	3,699,254	3,897,145	-197,891
2029	3,773,239	3,975,738	-202,498
2030	3,848,704	4,054,330	-205,626
2031	3,925,678	4,132,923	-207,244
2032	4,004,192	4,211,515	-207,323

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2033	4,084,276	4,290,108	-205,832
2034	4,165,961	4,368,700	-202,739
2035	4,249,280	4,447,293	-198,012

Both methodologies have validity; however the first method of using an EQR was selected for this community because it better reflects its character and nature.

APPENDIX E – METHODOLOGY FOR DETERMINING PRODUCED WATER AND WATER LOSS

Produced Water Calculations

Water sold/water produced 2009									
PRODUCED WATER (monthly totals MG) from MWW records									
ave daily use in winter	average daily use in summer (with irrigation)	245 days at 1.886 mgd	120 days at 4.3 mgd	365 day usage (water produced/yr)	water billed/yr 15% ave loss	city 2009 actuals	MWW 2009 actuals	totals	
1,886,000	4,300,000	462,070,000	516,000,000	978,070,000	827,733,181	billed produced losses	337,900,000 422,000,000 19.93%	461,000,000 522,000,000 11.69%	798,900,000 944,000,000 15.37%
				loss	150,336,819		84,100,000	61,000,000	145,100,000
using 2009 actual monthly usage data (MWW data)									
PRODUCED WATER (monthly totals MG) from MWW records									
	2006	2007	2008	2009					
June	139.872	134.344	121.971	92.846					
July	150.142	177.404	163.378	143.862					
August	131.144	134.050	145.617	157.922					
September	87.652	95.378	103.267	117.852					
Total	508.810	541.176	534.233	512.482					
AVG DAILY (MGD) (122 days)	4.171	4.436	4.379	4.201	4.297	.=average Daily Use MGD			
PRODUCED WATER (monthly totals MG) from MWW records									
	2006	2007	2008	2009					
Jan	62.580	67.631	65.073	60.481					
Feb	57.815	60.079	60.729	52.917					
Mar	69.342	65.600	66.837	58.527					
Apr	50.079	48.209	46.919	44.808					
May	72.354	81.425	56.160	71.203					
Oct	52.731	53.810	55.543	45.669					
Nov	47.284	48.539	44.068	40.349					
Dec	60.593	57.084	54.651	53.874					
Total	472.778	482.377	449.980	427.828					
AVG DAILY (MGD) (243 days)	1.946	1.985	1.852	1.761	1.886	.=average Daily Use MGD			
243									

**APPENDIX F – COST BENEFIT ANALYSIS WORKSHEETS FOR WATER
CONSERVATION PROGRAMS AND MEASURES**

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Measure/Program: U1. Leak Detection/Investigation					
Description of Measure/Program	This program is the investigation of leaks within the distribution line, employing sensor based protocols, methods or other technologies to proactively detect leaks. Goal is to evaluate 1 mile of pipe per year.			NOTES:	
Planning Period	2011-2021	2011-2021	years	<p>Planning period is 10 years, so annual value is multiplied by 10.</p> <p>50% of each systems non-revenue water City=19.95% MWW=11.69%</p> <p>Based on replacing 1 mile of pipe a year in each system. City: 59 miles equals 311,520 feet total, so 5280 ft. is approximately 1.69% of total distribution line. MWW: 57 total miles of pipe which equals 300,960 feet so 5280 ft. is 1.75% of the total distribution line.</p> <p style="text-align: right;">1,289,401</p> <p>Multiplied by 10</p> <p>Approximate, based on combined salaries averaged.</p> <p>linear feet</p> <p>Estimate</p>	
Years in Planning Period	10	10			
Total Annual Water Production without Savings	422,000,000	565,078,000	gallons/yr		
Estimated Water Production over Planning Period without Savings	4,220,000,000	556,078,000	gallons		
Annual Amount of non-revenue water	42,094,500	33,028,809	gallons		
Annual Estimated Water Savings Rate	1.69%	1.75%	%		
Estimated Annual Water Savings	711,397	578,004	gallons/yr		
Estimated Savings over Planning Period	7,113,971	5,780,042	gallons		
Labor Costs					
Staff Hours	40	40	per year		
Hourly Cost	\$35.00	\$35.00	per hour		
Annual Staff Costs	\$1,400.00	\$1,400.00			
Consultant Costs	\$20,000.00	\$20,000.00	per year		
Evaluation & Follow Up Cost	\$0.00	\$0.00	per year		
Annual Labor	\$21,400.00	\$21,400.00			
Materials Costs					
Unit Cost	\$7.84	\$4.05	per participant		
# of Participants	5,280	5,280	per year		
Gallons Saved per Unit per year	135	109	gallons		
Annual Materials	\$50,000.00	\$50,000.00			
Rebates	N/A	N/A			
Rebate Cost					
# of Participants					
Annual Rebate Cost					
One Time Labor & Material Costs					
One Time Materials Cost	N/A				
Labor Costs	N/A				
One Time Materials/Labor Costs	N/A				
Estimated Annual Cost	\$71,400.00	\$71,400.00			
Estimated Total Cost over Planning Period	\$714,000.00	\$714,000.00			
Cost per 1000 Gallons Saved	\$100.37	\$123.53			

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Measure/Program: U2. Distribution system Infrastructure repair /replacement & improvement			
Description of Measure/Program	Target goal is to replace/repair 1 mile of pipe a year in each district.		
Planning Period	2011-2021	2011-2021	years
Years in Planning Period	10	10	
Total Annual Water Production without Savings	422,000,000	565,078,000	gallons/yr
Annual Water Production without Savings	4,220,000,000	5,650,780,000	gallons in 10 yrs.
Estimated amount of water loss to infrastructure problems	42,052,300	30,510,900	
Annual Estimated Water Savings Rate	1.69%	1.75%	%
Estimated Annual Water Savings	710,684	533,941	gallons/yr
Estimated Savings over Planning Period	7,106,839	5,339,408	gallons
Labor Costs			
Staff Hours	900		per year
Hourly Cost	\$40.00		per hour
Annual Staff Costs	\$42,000.00	\$214,000.00	
Consultant Costs	\$50,000.00	\$28,000.00	per year
Evaluation & Follow Up Cost	\$25,000.00		per year
Annual Labor	\$117,000.00	\$242,000.00	
Materials Costs	\$150,000.00	\$104,000.00	
Unit Cost	\$50.57	\$65.53	per participant
# of Participants	5,280	5,280	ft./per year
Gallons Saved per Unit per year	135	101	gallons
Annual Materials	\$150,000.00	\$104,000.00	
Rebates			
Rebate Cost			
# of Participants			per year
Annual Rebate Cost			per year
One Time Labor & Material Costs	N/A	N/A	
One Time Materials Cost			
Labor Costs			
One Time Materials/Labor Costs			
Estimated Annual Cost	\$267,000.00	\$346,000.00	
Estimated Total Cost over Planning Period	\$2,670,000.00	\$3,460,000.00	
Cost per 1000 Gallons Saved	\$375.69	\$648.01	
<i>sources:</i>	BillingData(xls.)	MWW billing and payroll	

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Measure/Program:		U3. Tired Rate Structure		
Description of Measure/Program				Notes
	CITY: The rate structure for water billing is tiered for residential customers. Therefore the more water used the higher rate paid. The billing structure has five classes of water amounts with each increased level an increased price per 1000 gallon. There is also a base rate for water. Prices are different for commercial and residential use.	MWW: The rate structure for water billing is tiered for residential customers. Therefore the more water used the higher rate paid. The billing structure has three tiers. There is also a base rate for water. Prices are different for commercial and residential use.		
Planning Period	2011-2021	2011-2021	years	
Years in Planning Period	10	10		
Annual Water Production without Savings	422,000,000	565,078,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	4,220,000,000	5,650,780,000	gallons	Planning period is 10 years, so annual value is multiplied by 10.
1st Year Estimated Water Savings Rate	4.00%	4.00%	%	Estimation based on number of gallons sold from 2008 to 2009. January 2009 tired rate structure was implemented at CITY and that year water sales decreased by approximately 11%, for MWW water sales decreased by 11% as well. For a more conservative estimate a 4% savings value is used for first year and then a 1.5% reduction for years after, assuming rate increases continue, which is planned.
Annual Estimated Water Savings Rate	1.50%	1.50%		
Estimated Annual Water Savings in first year	13,516,000	18,440,000	gallons/yr	
Estimated Annual Water Savings	6,330,000	8,476,170	gallons/yr	1.5% reduction for remaining years. Approximation of gallons, weather conditions and tourism affect these numbers greatly.
Estimated Savings over Planning Period	70,486,000	94,725,530	gallons	First year plus remaining years (multiplied by 9)

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Labor Costs				
Staff Hours	50	25	per year	Estimation from Billing Clerk Based on utility billing clerk- pay scale #18 for City, Average of Director and Billing clerk cost for MWW
Hourly Cost	\$23.00	\$35.00	per hour	
Annual Staff Costs	\$1,150.00	\$875.00		
Consultant Costs				Based on \$28,000 charged to MWW for consulting services for years 2004-2006. City costs for consulting are about 30,000 ever 3 years. Very similar.
Evaluation & Follow Up Cost	\$0.00	\$0.00	per year	
Annual Labor	\$11,150.00	\$10,225.00		
Materials Costs	\$200.00	\$200.00		Printing and marketing Approximately 3000 customers
Unit Cost			per participant	
# of Participants	3000	3000	per year	
Gallons Saved per Unit per year	2110	2825	gallons	N/A
Annual Materials	\$200.00	\$200.00		
Rebates				
Rebate Cost				N/A
# of Participants			per year	
Annual Rebate Cost			per year	
One Time Labor & Material Costs				
One Time Materials Cost				
Labor Costs				
One Time Materials/Labor Costs				
Estimated Annual Cost	\$11,350.00	\$10,425.00		
Estimated Total Cost over Planning Period	\$113,500.00	\$104,250.00		
Cost per 1000 Gallons Saved for first year	\$0.84	\$0.57		
Cost per 1000 Gallons Saved for remaining years	\$1.79	\$1.23		
<i>sources:</i>	Water and Sewer rates (utility), billing data worksheet(LF)	Rates and billing data		

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Measure/Program: U4. Meter Enhancements			
Description of Measure/Program	CITY: Plans to convert to Smart Meters.	MWW: 2007 installed the five data collection units (DCU's) and the office-based NCC server which receives the meter data from the DCU's. 57% or 1,357 of our 2,380 meters are on the Aclara system. We are expecting to complete the retrofit of existing meters by mid 2012. The challenge in the District is getting access to second homes.	
			Notes
Planning Period	2011-2014	2011-2021	years
Years in Planning Period	3	2	
Annual Water Production without Savings	337,900,000	461,000,000	gallons/yr
Estimated Water Production over Planning Period without Savings	1,013,700,000	922,000,000	gallons
Annual Estimated Water Savings Rate	1.00%	1.00%	%
Estimated Annual Water Savings	10,137,000	4,610,000	gallons/yr
Estimated Savings over Planning Period	30,411,000	9,220,000	gallons
Labor Costs			
Staff Hours	100	20	per year
Hourly Cost	\$35.00	\$35.00	per hour
Annual Staff Costs	\$3,500.00	\$700.00	
Consultant Costs	0	0	per year
Evaluation & Follow Up Cost	\$0.00	\$0.00	per year
Annual Labor	\$3,500.00	\$23,100.00	
Materials Costs		\$71,687.50	
Unit Cost	\$185.33	\$165.14	per participant
# of Participants	1000	574	per year
Gallons Saved per Unit per year	10,137	8,031	gallons
Annual Materials	\$228,000.00	\$71,687.50	
Rebates	N/A		
Rebate Cost			
# of Participants			per year
Annual Rebate Cost			per year
One Time Labor & Material Costs	\$328,000.00	\$0.00	
One Time Materials Cost			
Labor Costs			
One Time Materials/Labor Costs			
Estimated Annual Cost of first year	\$331,500.00		
Estimated Annual Cost	\$231,500.00	\$94,787.50	
Estimated Total Cost over Planning Period	\$794,500.00	\$189,575.00	
Cost per 1000 Gallons Saved	\$26.13	\$41.12	
<i>sources:</i>	City of Evans, Senus		

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Measure/Program: U5. Hydrant Monitoring			
Description of Measure/Program	Performs annual hydrant testing and monitoring releasing unmetered water in order to flush hydrants and test valves. The amount of water used will remain the same, most likely, but the staff will be tracking flow rates and time of flushing in order to better quantify water used for this program.		
	Notes		
Planning Period	2011-2021	2011-2021	years
Years in Planning Period	10	10	
Annual Water Production without Savings	422,000,000	565,078,000	gallons/yr
Estimated Water Production over Planning Period without Savings	4,220,000,000	5,650,780,000	gallons
Annual Estimated Water Savings Rate	0.00%	0.00%	%
Estimated Annual Water Savings	0	0	gallons/yr
Estimated Savings over Planning Period	0	0	gallons
Labor Costs			
Staff Hours	25	25	per year
Hourly Cost	\$35.00	\$35.00	per hour
Annual Staff Costs	\$875.00	\$875.00	
Consultant Costs	\$200.00	\$200.00	per year
Evaluation & Follow Up Cost	\$0.00	\$0.00	per year
Annual Labor	\$1,110.00	\$1,110.00	
Materials Costs			
Unit Cost			per participant
# of Participants			per year
Gallons Saved per Unit per year			gallons
Annual Materials			
Rebates			
Rebate Cost			
# of Participants			per year
Annual Rebate Cost			per year
One Time Labor & Material Costs			
One Time Materials Cost			
Labor Costs			
One Time Materials/Labor Costs			
Estimated Annual Cost	\$1,110.00	\$1,110.00	
Estimated Total Cost over Planning Period	\$11,100.00	\$11,100.00	
Cost per 1000 Gallons	N/A	N/A	
<i>sources:</i>	Water and Sewer rates (utility), billing data worksheet(LF)	Rates and billing data	

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Measure/Program: U6. Bill Stuffers			
Description of Measure/Program:	This is a proposed education program that would develop informative inserts to be included with customer billings and/or separate mailings to customers providing them with tips on how to read the bill, why they should conserve water, and how.		NOTES
Planning Period	2011-2021		assuming 25% of consumers implement water conservation over 10 years, first year 15%, 2nd year additional 5%, 3-10 yrs additional 5% MWW, City & Stb II Metro 2009 prepare and mail develop educational information 3,000 taps each in City and MWW
Years in Planning Period		10	
Annual Water Production without Savings	978,070,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	9,780,700,000	gallons	
Annual Estimated Water Savings Rate	10%	%	
Estimated Annual Water Savings 1st year	36,677,625	gallons/yr	
Remaining years	12,225,875		
Estimated Savings over Planning Period	146,710,500	gallons	
Labor Costs			
Staff Hours	8	per year	
Hourly Cost	\$35	per hour	
Annual Staff Costs	\$280		
Consultant Costs	\$1,700	per year	
Evaluation & Follow Up Cost		per year	
Annual Labor	\$1,980		
Materials Costs	\$100		
total	\$2,080		
Unit Cost			
# of Partipants	6000	all	
Gallons Saved per Unit per year	2,038	gallons	
Rebates			
rebate cost residential	n/a		
Rebate Cost commerical			
# of Partipants		per year	
Annual Rebate Cost		per year	
One Time Labor & Material Costs			
One Time Materials Cost			
Labor Costs			
OneTime Materials/Labor Costs			
Estimated Annual Cost	\$2,080		
Estimated Total Cost over Planning Period	\$20,800		
Cost per 1000 Gallons Saved	\$0.14	\$0.06	
<i>sources:</i>	Vickers		
LH 9.17.10			

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Measure/Program: U10. Decorative Water Features Standards - new construction		
Description of Measure/Program:	This is a proposed program for MWW district only. Focus will be on lodging properties.	
		NOTES
Planning Period	2011-2021	
Years in Planning Period	10	
Annual Water Production without Savings for each small size fountain	754,560	gallons/yr
Estimated Water Production per small size fountain over Planning Period without Savings	7,545,600	gallons
Annual Estimated Water Savings Rate	100	%
Estimated Annual Water	754,560	gallons/yr
Estimated Savings over Planning Period	7,545,600	gallons
Labor Costs		
Staff Hours	5	per year
Hourly Cost	\$50	per hour
Annual Staff Costs	\$250	
Consultant Costs		
Evaluation & Follow Up Cost		
Annual Labor	\$250	
Materials Costs	\$100	
total	\$350	
Unit Cost		per participant
# of Partipants	1	per year
Gallons Saved per Unit per year	754,560	gallons
Rebates		
rebate cost residential	n/a	
Rebate Cost commerial		
# of Partipants		
Annual Rebate Cost		
One Time Labor & Material Costs		
One Time Materials Cost		
Labor Costs	250	
OneTime Materials/Labor Costs		
Estimated Annual Cost	\$350	
Estimated Total Cost over Planning Period	\$3,500	
Cost per 1000 Gallons Saved	\$0.46	\$0.46
<i>sources:</i>	Vickers	
LH 9.17.10		

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Measure/Program:		U11. Park Irrigation Monitoring	
Description of Measure/Program	Landscape irrigation audits on City managed parks, fields and irrigated areas. Auditor performs tests indicating current efficiency of system, lists any problems, and provides recommendations to improve system. Includes all parks regardless of water district.		
			Notes
Planning Period	2010-2021	years	120 days at 4.3 mgd Amount in 5 years 28 parks. Average size is 3.1 acres. Average usage is 2.2 million gallons per park, per year. 5 parks a year use about 10.9 million gallons. A 10% water reduction can be assumed though an irrigation audit.
Years in Planning Period	5		
Annual Water Production without Savings	516,000,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	2,580,000,000	gallons	
Total Amount used on Parks	61,477,372	gallons	
Average Amount used on 5 parks	10,978,102	gallons/per year	
Annual Estimated Water Savings Rate	10.00%	%	
Estimated Annual Water Savings	1,097,810	gallons/yr	
Estimated Savings over Planning Period	5,489,051	gallons	
Labor Costs			
Staff Hours	100	per year	
Hourly Cost	\$26.75	per hour	
Annual Staff Costs	\$2,675.00		
Consultant Costs	\$0.00	per year	
Evaluation & Follow Up Cost	\$400.00	per year	
Annual Labor	\$3,075.00		
Materials Costs			
Unit Cost	\$615.00	/participant	
# of Participants	5	per year	
Gallons Saved per Unit per year	219,562	gallons	
Annual Materials	\$50.00		
Rebates			
Rebate Cost	N/A		
# of Participants		per year	
Annual Rebate Cost		per year	
One Time Labor & Material Costs			
One Time Materials Cost	\$500.00		
Labor Costs			
One Time Materials/Labor Costs			
Estimated Annual Cost First Year			
	\$3,625.00		
Estimated Annual Cost following years			
	\$3,125.00		
Estimated Total Cost over Planning Period			
	\$16,125.00		
Cost per 1000 Gallons Saved			
	\$2.85		
<i>sources:</i>	Irrigation Association		Job Order Sheets, Water repair list by location, time sheets, ParksWaterDemand(LF)

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Measure/Program: U14. Meter Monitoring			
Description of Measure/Program	City: Replacing or repairing non functioning meters as necessary and as identified. MWW: Existing meters are tested periodically for leaks and accuracy and are replaced as necessary. Faulty meters account for apparent losses or losses due to meter inaccuracies. As the meter base ages more will fail and require replacement. The larger meter sizes supply a greater volume of water and therefore replacing sizes 2 inch and larger will have the largest influence on water savings.		
Planning Period	2011-2021	2011-2021	years
Years in Planning Period	10	10	
Annual Water Production without Savings	337,900,000	461,000,000	gallons/yr
Estimated Water Production over Planning Period without Savings	3,379,000,000	4,610,000,000	gallons
Annual Estimated Water Savings Rate	0.01%	0.01%	%
Estimated Annual Water Savings	48,000	48,000	gallons/yr
Estimated Savings over Planning Period	480,000	480,000	gallons
Labor Costs			
Staff Hours	15	43	per year
Hourly Cost	\$26.75	\$35.00	per hour
Annual Staff Costs	\$401.25		
Consultant Costs	\$0.00	\$0.00	per year
Evaluation & Follow Up Cost	\$0.00	\$0.00	per year
Annual Labor	\$401.25	\$1,505.00	
Materials Costs	\$11,500.00	\$11,500.00	
Unit Cost	\$2,380.25	\$2,601.00	per participant
# of Participants	5	5	per year
Gallons Saved per Unit per year	9,600	9,600	gallons
Annual Materials	\$11,500.00	\$11,500.00	
Rebates	N/A	N/A	
Rebate Cost			
# of Participants			per year
Annual Rebate Cost			per year
One Time Labor & Material Costs	N/A	N/A	
One Time Materials Cost			
Labor Costs			
One Time Materials/Labor Costs			
Estimated Annual Cost	\$11,901.25	\$13,005.00	
Estimated Total Cost over Planning Period	\$119,012.50	\$130,050.00	
Cost per 1000 Gallons Saved	\$247.94	\$270.94	
sources:	Instrument direct:GF63005AUBA16 ; Toshiba 2" magmeter / Integral Converter-Display. PU Rubber lined, 316L SS Electrodes. \$2,146 4"= 2189, 6" 2,567 Average of three sizes= \$2300		

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Measure/Program:	U15. Designate water conservation officer			
Description of Measure/Program	A staff person who manages water conservation issues, records and responds to complaints or inquires about water wasting, provides water recommendations and educates community on water saving measures. Produces valuable information sheets, educates public on conservation and continually seeks ways to improve water efficiency within the Utility Department and in the community. Manage rebate programs. The majority of hours spent on these tasks would be during summer months. In a drought situation this position is responsible for enforcing restrictions set forth in Stage 2 and 3 including but not limited to citing violators, granting permits, and mitigating civil disputes and customer reactions to drought scenario.			
	CITY	MWW		Notes
Planning Period	2011-2021	2011-2021	years	Planning period is 10 years, so annual value is multiplied by 10. Value is estimated at 5% the first year and 0.5% the following years. In a drought year the percentage would dramatically increase.
Years in Planning Period	10	10		
Annual Water Production without Savings	422,000,000	565,078,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	4,220,000,000	5,650,780,000	gallons	
Annual Estimated Water Savings Rate	5.00%	5.00%	%	
Annual Estimated Water Savings Rate	0.50%	0.50%	%	
Estimated 1st year Water Savings	21,100,000	28,253,900	gallons/yr	
Estimated Annual Water Savings	2,110,000	2,825,390	gallons/yr	
Estimated Savings over Planning Period	40,090,000	53,682,410	gallons	
Labor Costs				
Staff Hours	250	100	per year	
Hourly Cost				
	\$26.75	\$35.00	per hour	
Annual Staff Costs	\$6,687.50	\$3,500.00		
Consultant Costs				
	\$0.00	\$4,250.00	per year	
Evaluation & Follow Up Cost	\$0.00	\$0.00	per year	
Annual Labor	\$6,687.50	\$7,750.00		
Materials Costs				
	\$500.00	\$500.00		
Unit Cost	\$2.40	\$2.75	/participant	
# of Participants	3000	3000	per year	
Gallons Saved per Unit per year	703	942	gallons	
Annual Materials	\$500.00	\$500.00		
Rebates				
Rebate Cost	N/A	N/A		
# of Participants			per year	
Annual Rebate Cost			per year	
One Time Labor & Material Costs				
	N/A	N/A		
One Time Materials Cost				
Labor Costs				
One Time Materials/Labor Costs				
Estimated Annual Cost	\$7,187.50	\$8,250.00		
Estimated Total Cost over Planning Period	\$71,875.00	\$82,500.00		
Cost per 1000 Gallons Saved-1st Yr	\$0.34	\$0.29		
Cost per 1000 Gallons Saved	\$3.41	\$2.92		

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Measure/Program:	U16. Drought and Emergency Preparedness Plan				
Description of Measure/Program	Colorado experiences a wide range of climatic conditions. Plans to reduce usage are necessary to stretch the available water supply through periods of drought. Water supply systems are also at risk from uncertainties such as forest fires, failure of dams, mains, wells, and contamination of all or part of the raw water supply. The Steamboat Water Supply Plan identifies a forest fire as being a potential threat to the Fish Creek water supply that should be addressed. It further recommends that a Drought Response Plan be developed for the City and the District. In emergency or drought situations, contingency plans should be designed for implementation of mandatory measures in stages that minimize impacts to the economy, life-styles, and environment of the community. Plans should also be flexible in response to worsening or improving conditions.				
					Notes
Planning Period	2010-2021			years	120 days at 4.3 mgd total for the 3 years Percentage is of summer irrigation water usage. 60,200,000 180,600,000 Increases based on enforcement time Based on water technician salary pay scale #20 Paper materials, printing, distribution 6000 total customers Each year is a one time senerio.
Years in Planning Period	1	1	1	3 years total	
Annual Water Production without Savings	516,000,000	516,000,000	516,000,000	gallons/yr	
Estimated Water Production over Planning Period without Savings			1,548,000,000	gallons	
Annual Estimated Water Savings Rate (stage 1,2,3, respectively)	5.00%	10.00%	20.00%	%	
Estimated Annual Water Savings	25,800,000	51,600,000	103,200,000	gallons/yr	
Estimated Savings over Planning Period	25,800,000	51,600,000	103,200,000	gallons	
Labor Costs					
Staff Hours	50	100	150	per year	
Hourly Cost	\$26.75	\$26.75	\$26.75	per hour	
Annual Staff Costs	\$1,337.50	\$2,675.00	\$4,012.50		
Consultant Costs	\$1,000.00	\$1,000.00	\$1,000.00	per year	
Evaluation & Follow Up Cost	\$0.00	\$0.00	\$0.00	per year	
Annual Labor	\$2,337.50	\$3,675.00	\$5,012.50		
Materials Costs					
Unit Cost	\$0.44	\$0.70	\$1.00	/ participant	
# of Participants	6000	6000	6000	per year	
Gallons Saved per Unit per year	4,300	8,600	17,200	gallons	
Annual Materials	\$300.00	\$500.00	\$1,000.00		
Rebates	N/A				
Rebate Cost					
# of Participants	6,000	6,000	6,000	per year	
Annual Rebate Cost				per year	
One Time Labor & Material Costs	\$0.00	\$0.00	\$0.00		
One Time Materials Cost					
Labor Costs					
One Time Materials/Labor Costs					
Estimated Annual Cost	\$2,637.50	\$4,175.00	\$6,012.50		
Estimated Total Cost over Planning Period	\$2,637.50	\$4,175.00	\$6,012.50		
Cost per 1000 Gallons Saved	\$0.10	\$0.08	\$0.06		
				\$4,275.00	

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Measure/Program: U17. Form Water Conservation Group			
Description of Measure/Program:	This is a proposed program that would coordinate efforts on a more regional basis among water districts/utilities as well as share information and resources for water conservation and drought response programs.		NOTES
Planning Period	2011-2021		<p>Ideas: track water conservation progress, have annual meetings, share info on rebates, etc., pool resources for media outreach, enforcement</p> <p>MWW, City 2009</p> <p>managers from all districts attend quarterly mtgs</p> <p>program dev, coordinate meetings, agendas, develop issue white papers, etc.</p> <p>roughly 3,000 each district</p>
Years in Planning Period	10		
Annual Water Production without Savings	978,070,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	9,780,700,000	gallons	
summer water production	516,000,000	gallons	
Annual Estimated Water Savings Rate	0.10%	%	
annual water savings	978,070		
water savings over planning period	9,780,700	gallons/yr	
Labor Costs			
Staff Hours	25	per year	
Hourly Cost	\$50	per hour	
Annual Staff Costs	\$1,250		
Consultant Costs	\$1,000	per year	
Evaluation & Follow Up Cost		per year	
Annual Labor	\$2,250		
Materials Costs	\$200		
total	\$2,450		
Unit Cost			
# of Partipants	6000	taps	
Gallons Saved per Unit per year		gallons	
Rebates			
rebate cost residential	n/a		
Rebate Cost commerical			
# of Partipants		per year	
Annual Rebate Cost		per year	
One Time Labor & Material Costs			
One Time Materials Cost			
Labor Costs			
OneTime Materials/Labor Costs			
Estimated Annual Cost	\$2,450		
Estimated Total Cost over Planning Period	\$24,500		
Cost per 1000 Gallons Saved	\$2.50	\$2.50	
<i>sources:</i>			
LH 9.17.10			

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Measure/Program: U18. Newsletters		
Description of Measure/Program:	This is a proposed education program that would develop annual newsletters to keep water conservation "top of mind" as well as provide program updates.	
		NOTES
Planning Period	2011-2021	
Years in Planning Period	10	
Annual Water Production without Savings	978,070,000	gallons/yr
Estimated Water Production over Planning Period without Savings	9,780,700,000	gallons
Annual Estimated Water Savings Rate	0.0050%	%
Estimated Annual Water Savings 1st year	48,904	gallons/yr
Estimated Savings over Planning Period	489,035	gallons
Labor Costs		
Staff Hours	8	per year
Hourly Cost	\$50	per hour
Annual Staff Costs	\$400	
Consultant Costs	\$425	per year
Evaluation & Follow Up Cost		per year
Annual Labor	\$825	
Materials Costs	\$100	
total	\$925	
Unit Cost		per tap
# of Partipants	6000	taps
Gallons Saved per Unit per year		gallons
Rebates		
rebate cost residential	n/a	
Rebate Cost commerical		
# of Partipants		per year
Annual Rebate Cost		per year
One Time Labor & Material Costs		
One Time Materials Cost		
Labor Costs		
OneTime Materials/Labor Costs		
Estimated Annual Cost	\$925	
Estimated Total Cost over Planning Period	\$9,250	
Cost per 1000 Gallons Saved	\$18.91	\$18.91
LH 9.17.10		

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Measure/Program:		U.19 Raw Water Conversion for Irrigation		
Description of Measure/Program	Conversion of irrigation systems at City Parks from filtered water to raw water. Each applicable park has a combination of a water source and/or decreed water rights associated. A complete feasibility analysis along with engineering and design for a pump station, diversion structure, irrigation systems and building costs and maintenance would be required.			
Notes				
Planning Period	2011-2021	years	<p>Total estimated annual usage at each of the following parks: Emerald, Little Toots, West Lincoln, Memorial, Ski Town Lions, Spring Creek Park, Stehley, Strawberry Park Field, Whistler. These parks have potential for raw water conversion due to proximity to water source. However some of these might not be viable and other parks that are not listed could be identified in the future.</p> <p>Based on approximately 1 park a year</p> <p>Average costs for superintendent and technician. -Hours constituent some systems maintenance.</p> <p>Master planning and preliminary design for 1 site</p> <p>construction costs</p> <p>1 park a year</p> <p>Estimation: Dependant on size of park.</p> <p>Cost to perform master planning and preliminary design and engineering for multiple locations.</p>	
Years in Planning Period	10			
Annual Water Production without Savings for program	30,000,000			
Estimated Water Production over Planning Period without Savings	300,000,000	gallons/yr		
Annual Estimated Water Savings Rate	10%	%		
Estimated Annual Water Savings	3,000,000	gallons/yr		
Estimated Savings over Planning Period	30,000,000			
Labor Costs				
Staff Hours	50	per year		
Hourly Cost	\$35.00	per hour		
Annual Staff Costs	\$1,750.00	per year		
Consultant Costs	\$4,000.00	per year		
Evaluation & Follow Up Cost				
Annual Labor	\$5,750.00			
Materials Costs				
Unit Cost	\$50,750.00	/participant		
# of Participants	1	per year		
Gallons Saved per Unit per year	3,000,000	gallons		
Annual Materials	\$45,000.00			
Rebates	N/A			
Rebate Cost	N/A			
# of Participants	N/A	per year		
Annual Rebate Cost	N/A	per year		
One Time Labor & Material Costs				
One Time Materials Cost	N/A			
Labor Costs	\$20,000.00			
One Time Materials/Labor Costs	N/A			
Estimated Annual Cost	\$52,750.00			
Estimated Total Cost over Planning Period	\$547,500.00			
Cost per 1000 Gallons Saved	\$17.58			
sources:	Aqua Engineering Inc.			

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Measure/Program: E1. Website Enhancements				
Description of Measure/Program	-fact sheets, water calculator, water saving tips, evapotranspiration info	Continue to add information and new tools as available.		
				Notes
Planning Period	2011-2021	2011-2021	years	<p>Based on public interest which fluctuates and is hard to quantify. Estimating small impact, at .005% of total water produced.</p> <p>3000 for City and MWW</p> <p>SBII: Website design</p>
Years in Planning Period	10	10		
Annual Water Production without Savings	422,000,000	565,078,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	4,220,000,000	5,650,780,000	gallons	
Annual Estimated Water Savings Rate	0.005%	0.005%	%	
Estimated Annual Water Savings	21,100	28,254	gallons/yr	
Estimated Savings over Planning Period	211,000.00	282,539.00	gallons	
Labor Costs				
Staff Hours	30	30	per year	
Hourly Cost	\$26.75	\$25.00	per hour	
Annual Staff Costs	\$802.50	\$750.00		
Consultant Costs	\$0.00	\$0.00	per year	
Evaluation & Follow Up Cost	\$0.00	\$0.00	per year	
Annual Labor	\$802.50	\$750.00		
Materials Costs				
Unit Cost	\$0.27	\$0.25	per participant	
# of Participants	3000	3000	per year	
Gallons Saved per Unit per year	7	9	gallons	
Annual Materials				
Rebates	N/A	N/A		
Rebate Cost				
# of Participants			per year	
Annual Rebate Cost			per year	
One Time Labor & Material Costs	N/A	N/A		
One Time Materials Cost				
Labor Costs				
One Time Materials/Labor Costs				
Estimated Annual Cost	\$802.50	\$750.00		
Estimated Total Cost over Planning Period	\$8,025.00	\$7,500.00		
Cost per 1000 Gallons Saved	\$38.03	\$26.55	\$32.29	

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Measure/Program: E2. Irrigator Training			
Description of Measure/Program:	This is a proposed education program that will target irrigation system designers/installers		NOTES
Planning Period	2011-2021		<p>18% per property targeted (summer months)</p> <p>4.3 mgd for peak days (120/yr), June, July, August, Sept (MWW & City)</p> <p>Metrics: 30 gpcd used for outdoor watering without conservation practices. 4 inches water /wk x 5,000 sq.ft = 12,280 gal/wk (Vickers)</p> <p>coordination</p> <p>annual training session in spring partnering with product manufactures, retailers, etc.</p>
Years in Planning Period	10		
Annual Water Production without Savings	516,000,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	5,160,000,000	gallons	
Annual Estimated Water Savings	2 % of irrigation water	%	
Estimated Annual Water Savings	10,320,000	gallons/yr	
Estimated Savings over Planning Period	103,200,000	gallons	
Labor Costs			
Staff Hours	5	per year	
Hourly Cost	\$50	per hour	
Annual Staff Costs	\$250		
Consultant Costs	\$1,700	per year	
Evaluation & Follow Up Cost		per year	
Annual Labor	\$1,950		
Materials Costs	\$1,000		
total	\$2,950		
Unit Cost	\$148	per participant	
# of Partipants	20	per year	
Gallons Saved per Unit per year	516000	gallons	
Rebates			
rebate cost residential	n/a		
Rebate Cost commerical			
# of Partipants	0	per year	
Annual Rebate Cost		per year	
One Time Labor & Material Costs			
One Time Materials Cost			
Labor Costs			
OneTime Materials/Labor Costs			
Estimated Annual Cost	\$2,950		
Estimated Total Cost over Planning Period	\$29,500		
Cost per 1000 Gallons Saved	\$0.29		
sources:	Vickers, Austin TX & Windsor WC Plans		
LH 9.17.10			

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Measure/Program:		E4. Irrigation/Xeriscape information	
Description of Measure/Program:	This is a proposed education program that will potentially be combined with rebate program R4. for both residential and commercial properties. Focus will also be on lodging properties and large irrigation users.		NOTES may be combined with R4. rebate program 18% per property targeted (summer months only), with 20 properties participating per year. Assume 10 commercial (12,280gal/wk x 16 weeks x 10 properties = 1.97 MGD/yr x 18% = 353,644), 10 residential (30gpcd x 3.2ppl/hh x 120 days x 10 = 115,200gal. 18%=20,736 gal saved / yr) targeted per year. 4.3 mgd for peak days (120/yr), June, July, August, Sept (MWW & City) Metrics: 30 gpcd used for outdoor watering without conservation practices. 4 inches water /wk x 5,000 sq.ft = 12,280 gal/wk (Vickers) 50hrs/yr for irrigation evaluations \$150 residential, \$1,000 commercial 10 each
Planning Period	2011-2021		
Years in Planning Period		10	
Annual Water Production without Savings	516,000,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	5,160,000,000	gallons	
Annual Estimated Water	18 % of irrigation water	%	
Estimated Annual Water Savings	468,844	gallons/yr	
Estimated Savings over Planning Period	4,688,440	gallons	
Labor Costs			
Staff Hours	10	per year	
Hourly Cost	\$50	per hour	
Annual Staff Costs	\$500		
Consultant Costs	\$4,250	per year	
Evaluation & Follow Up Cost			
Annual Labor	\$4,750		
Materials Costs	\$100		
total	\$4,850		
Unit Cost	\$243	per participant	
# of Partipants	20	per year	
Gallons Saved per Unit per year	23,442	gallons	
Rebates			
rebate cost residential	\$150		
Rebate Cost commerical	\$1,000		
# of Partipants	20	per year	
Annual Rebate Cost	\$11,500	per year	
One Time Labor & Material Costs			
One Time Materials Cost			
Labor Costs			
OneTime Materials/Labor Costs			
Estimated Annual Cost	\$16,350		
Estimated Total Cost over Planning Period	\$163,500		
Cost per 1000 Gallons Saved	\$34.87		
sources:	Vickers, Austin TX & Windsor WC Plans		
LH 9.17.10			

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Measure/Program: E5. Youth Education Program			
Description of Measure/Program:	This is a proposed education program that would target school age water users	NOTES	
Planning Period	2011-2021	<p>MWW, City 2009</p> <p>assuming 25% of consumers implement water conservation over 10 years, first year 15%, 2nd year additional 5%, 3-10 yrs additional 5%</p> <p>program development & assist implementation</p> <p>2,800 taps at City in 2010 , 3000 MWW taps</p>	
Years in Planning Period	10		
Annual Water Production without Savings	978,070,000		gallons/yr
Estimated Water Production over Planning Period without Savings	9,780,700,000		gallons
Annual Estimated Water	0.50%		%
Estimated Annual Water Savings 1st year	36,677,625		gallons/yr
Estimated Annual Water Savings	1,222,588		gallons/yr
Estimated Savings over Planning Period	47,680,913		gallons
Labor Costs			
Staff Hours	10		per year
Hourly Cost	\$50		per hour
Annual Staff Costs	\$500		
Consultant Costs	\$1,700		per year
Evaluation & Follow Up Cost			per year
Annual Labor	\$2,200		
Materials Costs	\$100		
total	\$2,300		
Unit Cost			per tap
# of Partipants	6000		all
Gallons Saved per Unit per year	203.76		gallons
Rebates			
rebate cost residential	n/a		
Rebate Cost commerical			
# of Partipants		per year	
Annual Rebate Cost		per year	
One Time Labor & Material Costs			
One Time Materials Cost	1000		
Labor Costs			
OneTime Materials/Labor Costs			
Estimated Annual Cost	\$2,300		
Estimated Total Cost over Planning Period	\$24,000		
Cost per 1000 Gallons Saved	\$0.50		
sources:			
LH 9.17.10	Vickers		

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Measure/Program: E 6&7. General Public Education		
Description of Measure/Program:	This is a proposed education program that would provide an annual public event along with potential partners to raise awareness of water conservation technology, appliances, rebates, local availability, etc.	NOTES
Planning Period	2011-2021	
Years in Planning Period	10	
Annual Water Production without Savings	978,070,000	gallons/yr
Estimated Water Production over Planning Period without Savings	9,780,700,000	gallons
Annual Estimated Water Savings 1st year	0.0500%	%
Estimated Annual Water Savings 1st year	489,035	gallons/yr
Estimated Savings over Planning Period	4,890,350	gallons
Labor Costs		
Staff Hours	10	per year
Hourly Cost	\$50	per hour
Annual Staff Costs	\$500	
Consultant Costs	\$850	per year
Evaluation & Follow Up Cost		per year
Annual Labor	\$1,350	
Materials Costs	\$500	
total	\$1,850	
Unit Cost		per tap
# of Partipants	6000	all
Gallons Saved per Unit per year	81.50583333	gallons
Rebates		
rebate cost residential	n/a	
Rebate Cost commerical		
# of Partipants		per year
Annual Rebate Cost		per year
One Time Labor & Material Costs		
One Time Materials Cost		
Labor Costs		
OneTime Materials/Labor Costs		
Estimated Annual Cost	\$1,850	
Estimated Total Cost over Planning Period	\$18,500	
Cost per 1000 Gallons Saved	\$3.78	\$3.78
sources:		
LH 9.17.10		

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Measure/Program: E9. Commercial Education Program		
Description of Measure/Program:	This is a proposed education program targeted to commercial establishments. The program would partner with the Steamboat Sustainable Business Program as well as work with large users. Commercial audits and rebates may be included.	
NOTES		
Planning Period	2011-2021	
Years in Planning Period	10	
Annual Water Production <i>without Savings</i>	328,500,000	gallons/yr
Estimated Water Production over Planning Period without Savings	3,285,000,000	gallons
Estimated Water Savings Rate	10.00	%
Estimated Annual Water Savings 1st year	3,285,000	gallons/yr
Estimated Savings over Planning Period	32,850,000	gallons
Labor Costs		
Staff Hours		10% over planning period
Hourly Cost	5	per year
Annual Staff Costs	\$250	
Consultant Costs	\$5,100	per year
Evaluation & Follow Up Cost		per year
Annual Labor	\$5,350	
Materials Costs	\$100	
total	\$5,450	60 hrs
Unit Cost		per tap
# of Partipants	6000 taps?	all
Gallons Saved per Unit per year		gallons
Rebates		
rebate cost residential	n/a	
Rebate Cost commerical		
# of Partipants		per year
Annual Rebate Cost		per year
One Time Labor & Material Costs		
One Time Materials Cost		
Labor Costs		
OneTime Materials/Labor Costs		
Estimated Annual Cost	\$5,450	
Estimated Total Cost over Planning Period	\$54,500	
Cost per 1000 Gallons Saved	\$1.66	\$1.66
<i>sources:</i>	Vickers	
LH 9.17.10		

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Measure/Program: E11. Professional Training		
Description of Measure/Program:	This is a proposed education program that will target architects, planners, landscape design companies, plumbers and developers	
		NOTES
Planning Period	2011-2021	
Years in Planning Period	10	
Annual Water Production without Savings	978,070,000	gallons/yr
Estimated Water Production over Planning Period without Savings	9,780,700,000	gallons
Annual Estimated Water Savings Rate	0.05	%
Estimated Annual Water	4,890,350	gallons/yr
Estimated Savings over Planning Period	48,903,500	gallons
Labor Costs		
Staff Hours	5	per year
Hourly Cost	\$50	per hour
Annual Staff Costs	\$250	
Consultant Costs	\$1,275	per year
Evaluation & Follow Up Cost		per year
Annual Labor	\$1,525	
Materials Costs	\$500	
total	\$2,025	
Unit Cost		participant
# of Partipants		per year
Gallons Saved per Unit per year		gallons
Rebates		
rebate cost residential	n/a	
Rebate Cost commerical		
# of Partipants		per year
Annual Rebate Cost		per year
One Time Labor & Material Costs		
One Time Materials Cost		
Labor Costs		
OneTime Materials/Labor Costs		
Estimated Annual Cost	\$2,025	
Estimated Total Cost over Planning Period	\$20,250	
Cost per 1000 Gallons Saved	\$0.41	\$0.41
<i>sources:</i>	Vickers, Austin TX & Windsor WC Plans	
LH 9.17.10		

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Mount Werner Water, City of Steamboat Springs*

Measure/Program: E8&10.&A1 Lodging Property & HOA Program		
Description of Measure/Program:	This is a proposed education program targeted to lodging properties and homeowner associations, some of the largest users in the MWW district. Rebates may also be incorporated.	NOTES rebates would be dependant on obtaining grant money 10% of commercial class use Sheraton used 10.2MGD/yr (2009), Sbt. Grand used 8.7 MGD/yr 2009 assuming 10 properties per year at the size of sheraton 10 hrs/property
Planning Period	2011-2021	
Years in Planning Period	10	
Annual Water Production without Savings	102,610,000 gallons/yr	
Estimated Water Production over Planning Period without Savings	1,026,100,000 gallons	
Annual Estimated Water	10% %	
Estimated Annual Water Savings	10,261,000 gallons/yr	
Estimated Savings over Planning Period	102,610,000 gallons	
Labor Costs		
Staff Hours	5 per year	
Hourly Cost	\$50 per hour	
Annual Staff Costs	\$250	
Consultant Costs	\$8,500 per year	
Evaluation & Follow Up Cost	per year	
Annual Labor	\$8,750	
Materials Costs	\$100	
total	\$8,850	
Unit Cost		
# of Partipants		
Gallons Saved per Unit per year	gallons	
Rebates		
rebate cost residential	n/a	
Rebate Cost commerial		
# of Partipants	per year	
Annual Rebate Cost	per year	
One Time Labor & Material Costs		
One Time Materials Cost		
Labor Costs		
OneTime Materials/Labor Costs		
Estimated Annual Cost	\$8,850	
Estimated Total Cost over Planning Period	\$88,500	
Cost per 1000 Gallons Saved	\$0.86	
<i>sources:</i>	Vickers	
<i>LH 9.17.10</i>		

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Measure/Program:		R1.a. Commercial Toilet replacement Incentive	
Description of Measure/Program	This program consists of indentifying qualified recipients in the community, through the Sustainable Business Program, or by business owners applying and showing a need for a toilet upgrade. The program would offer \$150 to offset the cost of a Water Sense toilet. The goal is to replace 25 commercial toilets a year, for five year duration. This rebate program is not retroactive and must first be approved by The City of Steamboat Springs or MWW official due to limited funding.		
			Notes
Planning Period	2011-2016		Average Number of produced gallons Value multiplied by 5 years Assuming old toilets are producing at least 3.5 gallons per flush. The average number of flushes in a commercial use is estimated at 40.8 times a day, totaling 143 gallons a day. Multiplied by 365 days a year and 25 toilets equals 1,304,875 gal. Replacing the 3.5 gallon toilets with 1.28 gallons represents a 63 % savings or 822,071 gallons per year which is 03% of the total water produced 10 toilets replacement inspections, plus planning and coordinating Water Technician hours consultant for 35 hours Grant planning and program development, advertising. 50 hours at 50.00 for City Staff. 15
Years in Planning Period	5	years	
Annual Water Production	978,070,000	gallons/year	
without Savings			
Estimated Water Production over Planning Period without Savings	4,890,350,000	gallons	
Annual Estimated Water Savings Rate	0.03%	%	
Estimated Annual Water Savings	822,071	gallons/yr	
Estimated Savings over Planning Period	4,110,356.25	gallons	
Labor Costs			
Staff Hours	25	per year	
Hourly Cost	\$26.75	per hour	
Annual Staff Costs	\$668.75		
Consultant Costs	\$2,975.00	per year	
Evaluation & Follow Up Cost	\$0.00	per year	
Annual Labor	\$3,643.75		
Materials Costs			
Unit Cost	\$100.00	per participant	
# of Participants	25	per year	
Gallons Saved per Unit per yr	32,882.85	gallons	
Annual Materials			
Rebates			
Rebate Cost	\$150.00		
# of Participants	25	per year	
Annual Rebate Cost	\$3,750.00	per year	
One Time Labor & Material Costs			
One Time Materials Cost	500		
Labor Costs	\$3,775		
One Time Materials/Labor Costs	\$4,275.00		
Estimated Annual Cost	\$7,393.75		
Estimated Total Cost over Planning Period	\$40,743.75		
Cost per 1000 Gallons Saved	\$8.99		
sources:	EPA WaterSense, Energy Star		

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Measure/Program:	R1.b. Residential Toilet replacement Incentive
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Description of Measure/Program	The goal of this program is to encourage residents to replace toilets 3.5 gallons and greater with EPA recognized Water Sense, high-efficiency toilets (maximum flush 1.28 gallons). The City would administer funds but both districts customers are eligible. This program would allow residents who qualify to receive a \$100 to offset the cost of a Water Sense toilet. The goal is to replace 100 residential toilets per year, for five year duration. This program would operate on a first come, first served basis until the 100 toilets for the year have been replaced.
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		Notes
Planning Period	2011-2016 years	
Years in Planning Period	5	
Annual Water Production without Savings	978,070,000 gallons/yr	
Estimated Water Production over Planning Period without Savings	4,890,350,000 gallons	Multiplied by 5 years
Annual Estimated Water Savings Rate	0.02% %	5.1 flushes a day at 3.5 gallons each flush for residential use is estimated by the EPA. 50 toilets, flushing 5.1 times a day for 365 days in year equals 325,763 gallons. Replacing 50 toilets with a 1.28 gallon tank would save 206,627 gallons a year, which is .02% of total water produced.
Estimated Annual Water Savings	195,614 gallons/yr	
Estimated Savings over Planning Period	978,070 gallons	
Labor Costs		
Staff Hours	100 per year	
Hourly Cost	\$26.75 per hour	Water Technician hours
Annual Staff Costs	\$2,675.00	
Consultant Costs	\$1,700.00 per year	consultant for 10 hours
Evaluation & Follow Up Cost	\$0.00 per year	
Annual Labor	\$4,375.00	
Materials Costs		
Unit Cost	\$100.00 per participant	
# of Participants	100 per year	
Gallons Saved per Unit per year	1,956 gallons	
Annual Materials		
Rebates		
Rebate Cost	\$100.00	
# of Participants	100 per year	
Annual Rebate Cost	\$10,000.00 per year	
One Time Labor & Material Costs		Grant planning and program development, advertising. 50 hours at 50.00 for City Staff. 15 hours for consultant
One Time Materials Cost	4275	
Labor Costs	500	
One Time Materials/Labor Costs	3775	
Estimated Annual Cost		
	\$14,375.00	doesn't include set up
Estimated Total Cost over Planning Period	\$76,150.00	
Cost per 1000 Gallons Saved	\$73.49	
<i>sources:</i>	Specification Supporting Statement	

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Measure/Program:	R2. Clothes Washer Replacement Incentive.		
Description of Measure/Program	This program will provide financial incentives to residents who upgrade their existing clothes washers to an Energy Star certified appliance. To qualify the machine being replaced must be over 10 years old. The program would be for five year duration, offering per year \$100 rebates for 75 new washing machines. This program would operate on a first come, first served basis. The City would administer funds but both districts customers are eligible.		
			Notes
Planning Period	2011-2016	years	Average number of washing loads per year is 400 which consume 43 gallons of water per load, multiplied by 75 washing machines equate to 1,290,000 gallons. It is estimated for energy star appliances to save 17 gallons per load, reducing total number of gallons to 780,000 a year for a 510,000 gallons annual water savings, which is .05% of total water produced.
Years in Planning Period	5		
Annual Water Production without Savings	978,070,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	4,890,350,000	gallons	
Annual Estimated Water Savings Rate	0.05%	%	
Estimated Annual Water Savings	510,000	gallons/yr	
Estimated Savings over Planning Period	2,550,000	gallons	
Labor Costs			
Staff Hours	75	per year	
Hourly Cost	\$26.75	per hour	
Annual Staff Costs	\$2,006.25		
Consultant Costs	\$1,275.00	per year	
Evaluation & Follow Up Cost	\$0.00	per year	
Annual Labor	\$3,281.25		
Materials Costs			
Unit Cost	\$100.00	per participant	
# of Participants	75	per year	
Gallons Saved per Unit per year	6,800	gallons	
Annual Materials			
Rebates			
Rebate Cost	\$100.00		
# of Participants	75	per year	
Annual Rebate Cost	\$7,500.00	per year	
One Time Labor & Material Costs			
One Time Materials Cost	\$500.00		
Labor Costs	\$3,775.00		
One Time Materials/Labor Costs	\$4,275.00		
Estimated Annual Cost	\$10,781.25		
Estimated Total Cost over Planning Period	\$58,181.25		
Cost per 1000 Gallons Saved	\$21.14		
<i>sources:</i>	EPA Energy Star, Water Sense		

Measure/Program:	R3. Dishwasher Replacement Incentive
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Description of Measure/Program	<p>This program will provide financial incentives to residents who upgrade their existing dishwasher to an Energy Star certified appliance. To qualify the machine being replaced must be over 8 years old. The program would be for a five year duration, offering per year \$75 rebates for 50 new dishwashers. This rebate program is not retroactive and must first be approved by a City of Steamboat Springs or MWW official due to limited funding. This program would operate on a first come, first served basis. The City would administer funds but both districts customers are eligible.</p>	
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		Notes
Planning Period	2011-2016	years
Years in Planning Period		5
Annual Water Production without Savings		978,070,000 gallons/yr
Estimated Water Production over Planning Period without Savings		4,890,350,000 gallons
Annual Estimated Water Savings Rate		0.01% %
Estimated Annual Water Savings		93,600 gallons/yr
Estimated Savings over Planning Period		468,000 gallons
Labor Costs		
Staff Hours		75 per year
Hourly Cost		\$26.75 per hour
Annual Staff Costs		\$2,006.25
Consultant Costs		\$1,275.00 per year
Evaluation & Follow Up Cost		\$0.00 per year
Annual Labor		\$3,281.25
Materials Costs		
Unit Cost		\$75.00 per participant
# of Participants		50 per year
Gallons Saved per Unit per year		1872 gallons
Annual Materials		
Rebates		
Rebate Cost		\$75.00
# of Participants		50 per year
Annual Rebate Cost		\$3,750.00 per year
One Time Labor & Material Costs		
One Time Materials Cost		\$500.00
Labor Costs		\$3,775.00
One Time Materials/Labor Costs		\$4,275.00
Estimated Annual Cost		\$7,031.25
Estimated Total Cost over Planning Period		\$39,431.25
Cost per 1000 Gallons Saved		\$75.12
<i>sources:</i>	Energy Star, Penn State: Estimating Water Use and Savings in Your Home	

Average household uses dishwasher 5 times per week, with an average of 11 gallons per load for a total of 2640 gallons a year, multiplied by 75 washers equals 198,000 gals. Water efficient (Energy Star) are required to use less than 5.8 gallons a load, which equals 104,400 gallons per year for a total water savings of 93,600 gallons, which is .01% of total produced water.

Based on Water Technician Salary consultant for 15 hours

Grant planning and program development, advertising. 50 hours at 50.00 for City Staff. 15 hours for consultant

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Measure/Program:	R4a. Residential Irrigation Enhancement Incentives
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Description of Measure/Program	This program will provide financial incentives to people who upgrade their existing irrigation equipment. The program would be for five year duration, offering per year \$75 rebates for 100 individual residents for rain sensors and efficient spray heads. This program would operate on a first come, first served basis and requires proof of purchase and an affidavit indicating installation. The City would administer funds but both districts customers are eligible.
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		Notes
Planning Period	2011-2016	
Years in Planning Period	5 years	
Annual Water Production without Savings	516,000,000 gallons/yr	120 days at 4.3 mgd
Estimated Water Production over Planning Period without Savings	2,580,000,000 gallons	
Annual water amount of program(based on number of participates)	1,728,000	4.3 mgd for peak days (120/yr), June, July, August, Sept (MWW & City). Assume all are residential properties (30gpcd x 3.2ppl/hh x 120 days x number of participants)
Annual Estimated Water Savings Rate	18.00% %	10% per property targeted (summer months only)
Estimated Annual Water Savings	311,040 gallons/yr	
Estimated Savings over Planning Period	1,555,200 gallons	
Labor Costs		
Staff Hours	60 per year	Administrative time
Hourly Cost	\$26.75 per hour	Based on Water Technician salary
Annual Staff Costs	\$1,605.00	
Consultant Costs	3400 per year	Consultant at 40 hours
Evaluation & Follow Up Cost	\$0.00 per year	
Annual Labor	\$5,005.00	
Materials Costs		
Unit Cost	\$75.00 per participant	
# of Participants	100 per year	
Gallons Saved per Unit per year	3,110 gallons	
Annual Materials	\$7,500.00	
Rebates		
Rebate Cost	\$75.00	
# of Participants	100 per year	
Annual Rebate Cost	\$7,500.00 per year	
One Time Labor & Material Costs		
One Time Materials Cost	N/A	Grant planning and program development, advertising. 50 hours at 50.00 for City Staff. 15 hours for consultant
	500	
Labor Costs	3775	
One Time Materials/Labor Costs	4275	
Estimated Annual Cost	\$12,505.00	
Estimated Total Cost over Planning Period	\$66,800.00	
Cost per 1000 Gallons Saved	\$40.20	

sources: Cost of efficient spray heads=approx. 6 dollars per head. Rain Rainbird-water savings products sensors average cost 15-25.

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Measure/Program:	R5. Commercial Irrigation Enhancement Incentives		
Description of Measure/Program	This program will provide financial incentives to business or Home Owner Associations who upgrade their existing irrigation equipment. The program would be for five year duration, offering per year \$1000 rebates for 5 individual properties for rain sensors and efficient spray heads. This rebate program would include an on site consultation to determine deficient areas and provide recommended upgrades.		
			Notes
Planning Period	2011-2016		Average HOA property size is 100,000 sq. feet of irrigated area. 4 inches a week. Assume 5 commercial (12,280gal/wk x 16 weeks x 5 properties = 982,400 gallons per year. However the 12,280 is for a 5,000 sq ft. area. 20 times that amount is the average HOA irrigated area, therefore producing 19,648,000 gallons per year.
Years in Planning Period	5	years	
Annual Water Production without Savings	19,648,000		
Estimated Water Production over Planning Period without Savings	98,240,000		
Annual Estimated Water Savings Rate	18.00%	%	
Estimated Annual Water Savings	3,536,640	gallons/yr	
Estimated Savings over Planning Period	17,683,200	gallons	
Labor Costs			
Staff Hours	15	per year	
Hourly Cost	\$26.75	per hour	
Annual Staff Costs	\$401.25		
Consultant Costs	4250	per year	
Evaluation & Follow Up Cost	\$0.00	per year	
Annual Labor	\$4,651.25		
Materials Costs			
Unit Cost	\$1,000.00	per participant	
# of Participants	5	per year	
Gallons Saved per Unit per year	707,328	gallons	
Annual Materials	\$5,000.00		
Rebates			
Rebate Cost	\$1,000.00		
# of Participants	5	per year	
Annual Rebate Cost	\$5,000.00	per year	
One Time Labor & Material Costs			
One Time Materials Cost	500		
Labor Costs			
	\$3,775.00		
One Time Materials/Labor Costs	\$4,275.00		
Estimated Annual Cost	\$9,651.25		
Estimated Total Cost over Planning Period	\$52,531.25		
Cost per 1000 Gallons Saved	\$2.73		
sources:	Rainbird-water savings products	Cost of efficient spray heads=approx. 6 dollars per head. Rain sensors average cost 15-25.	
Outdoor usage for Potable Residential and Multi family categories is estimated at 0.21 af/tap, which is the rate for Residential nonpotable customer category.			
Wind and Rain Sensors can save an estimated 5% to 10% of water used outdoors and costs approximately \$25 to \$45.* The amount of water that can be saved through improved programming of an irrigation system controller varies but is estimated to be at least 10% to 15%. The cost of automatic irrigation system controllers for residential use ranges from about \$50 to \$250, depending on the features			
*Based on "Handbook of Water Use and Conservation" by Amy Vickers			

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Measure/Program:		A2. Indoor Residential Audits			
Description of Measure/Program	City: Monitoring and response program to abnormal water usage. Program detects abnormally high water use and then a water technician contacts customer to assess situation. If there was no reason for excess water use, the technician would do an on-site assessment to determine if there is a problem, like a potential leak.				
				Notes	
Planning Period	2011-2016	2011-2016	years	Each district performs or responds to 75 incidents. If there is a residential leak on average 200 gallons are wasted a day, assuming the issue could be corrected after 1 month, the water savings equals 450,000 gallons in a year per district.	
Years in Planning Period	10	10			
Annual Water Production without Savings	422,000,000	565,078,000	gallons/yr		
Estimated Water Production over Planning Period without Savings	4,220,000,000	5,650,780,000	gallons		
Annual Estimated Water Savings Rate	0.10%	0.08%	%		
Estimated Annual Water Savings	450,000	450,000	gallons/yr		
Estimated Savings over Planning Period	4,500,000	4,500,000	gallons		9,000,000
Labor Costs					Assuming each audit takes 3 hours
Staff Hours	225	225	per year		
Hourly Cost	\$26.75	\$25.00	per hour		
Annual Staff Costs	\$6,018.75	\$5,625.00			
Consultant Costs	\$0.00	\$0.00	per year		
Evaluation & Follow Up Cost	\$0.00	\$0.00	per year		
Annual Labor	\$6,018.75	\$5,625.00			
Materials Costs				Per audit	
Unit Cost	\$401.25	\$375.00	per participant		
# of Participants	75	75	per year		
Gallons Saved per Unit per year	6,000	6,000	gallons		
Annual Materials	0	0			
Rebates				Grant planning and program development, advertising. 50 hours at 50.00 for City Staff. 15 hours for consultant	
Rebate Cost	N/A	N/A			
# of Participants			per year		
Annual Rebate Cost			per year		
One Time Labor & Material Costs					
One Time Materials Cost	500				
Labor Costs	3775				
One Time Materials/Labor Costs	4275				
Estimated Annual Cost	\$6,018.75	\$5,625.00			
Estimated Total Cost over Planning Period	\$60,187.50	\$56,250.00			
Cost per 1000 Gallons Saved	\$13.38	\$12.50			
sources:	EarthEasy.com: 25 ways to conserve water				

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Measure/Program:		A3. Outdoor Residential Audits		
Description of Measure/Program	Monitoring and response program to abnormal water usage. Program detects abnormally high water use and then a water technician contacts customer to assess situation. If there was no reason for excess water use, the technician would do an on-site assessment to determine if there is a problem, like a potential leak.			
				Notes
Planning Period	2011-2016	2011-2016	years	516,000,000 is the total produced water at 4.3 mgd for the 120 irrigation season. The City comprises approximately 45% of the produced water with MWW at 55%.
Years in Planning Period	10	10		
Annual Water Production without Savings	232,200,000	283,800,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	2,322,000,000	2,838,000,000	gallons	
Amount that 20 customers produces	230,400	230,400		
Annual Estimated Water Savings Rate	18.00%	18.00%	%	
Estimated Annual Water Savings	41,472	41,472	gallons/yr	
Estimated Savings over Planning Period	414,720	414,720	gallons	
Labor Costs				
Staff Hours	60	60	per year	
Hourly Cost	\$26.75	\$85.00	per hour	
Annual Staff Costs	\$1,605.00	\$5,100.00		
Consultant Costs	\$0.00	\$0.00	per year	
Evaluation & Follow Up Cost	\$0.00	\$0.00	per year	
Annual Labor	\$1,605.00	\$5,100.00		
Materials Costs	N/A	N/A		
Unit Cost	\$80.25	\$255.00	per participant	Number of audits
# of Participants	20	20	per year	
Gallons Saved per Unit per year	2,074	2073.6	gallons	
Annual Materials	0	0		
Rebates	N/A	N/A		
Rebate Cost				Grant planning and program development, advertising. 50 hours at 50.00 for City Staff. 15 hours for consultant
# of Participants			per year	
Annual Rebate Cost			per year	
One Time Labor & Material Costs				
One Time Materials Cost	250	250		
Labor Costs	2500	1275		
One Time Materials/Labor Costs	2750	1525		
Estimated Annual Cost	\$1,605.00	\$5,100.00		
Estimated Total Cost over Planning Period	\$16,050.00	\$51,000.00		
Cost per 1000 Gallons Saved	\$38.70	\$122.97		