Steamboat Springs, Colorado
Water Conservation Plan II

May, 2011

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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A special thanks to the Colorado Water Conservation Board which helped to fund 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:

- 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
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 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 save 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).

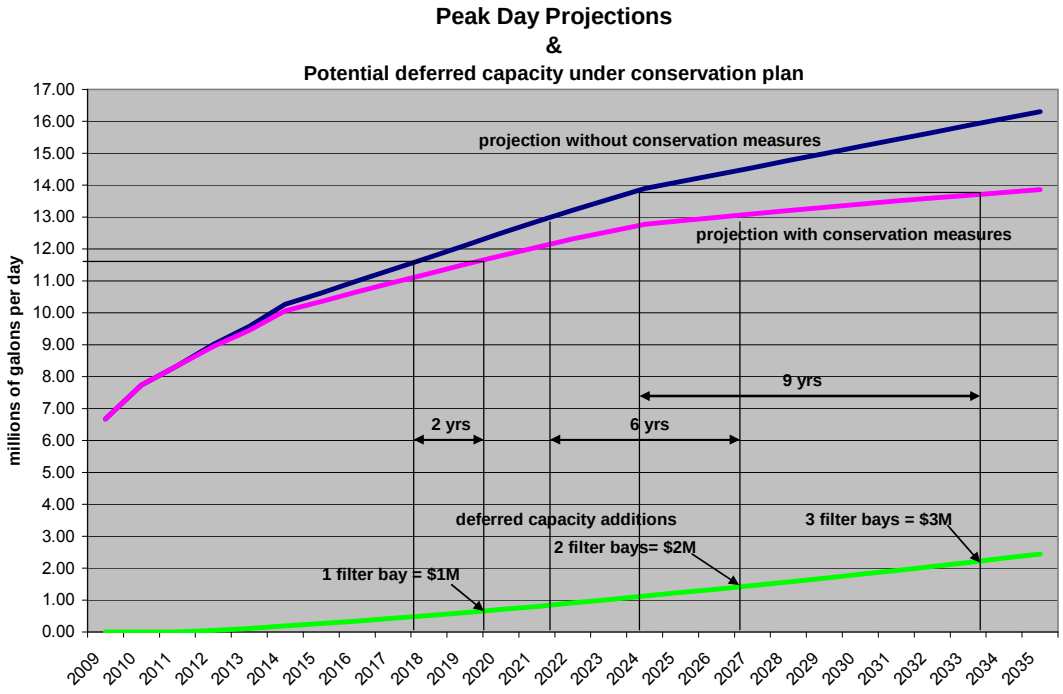
Suggested Conservation Measures

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. By implementing the program 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

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
TOTAL	**30,997,785**		

Result: 3% savings of total water produced

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
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
- Leak Detection U1

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 in Appendix G 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.

The full Drought and Water Emergency Preparedness Plan (DWEPP) is included in Appendix G, which is incorporated into this plan by this reference as if fully set forth herein.

The Stage 1 recommended guidelines of the DWEPP listed below will become a Water Consumer Initiative and will be implemented as part of water conservation measures U6, E1, E4, E6 and E7:

- 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 June15th 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.
- Encourage cutting lawn grass no shorter than 3 inches to reduce soil moisture loss and to promote deeper roots.
- Limit the filling of swimming pools to one per year, unless draining for repairs is necessary.

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 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 existing 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 wireless transponders on water meters to relay water usage twice daily to a data base. This technology is 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 more than 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
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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 can more than double 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

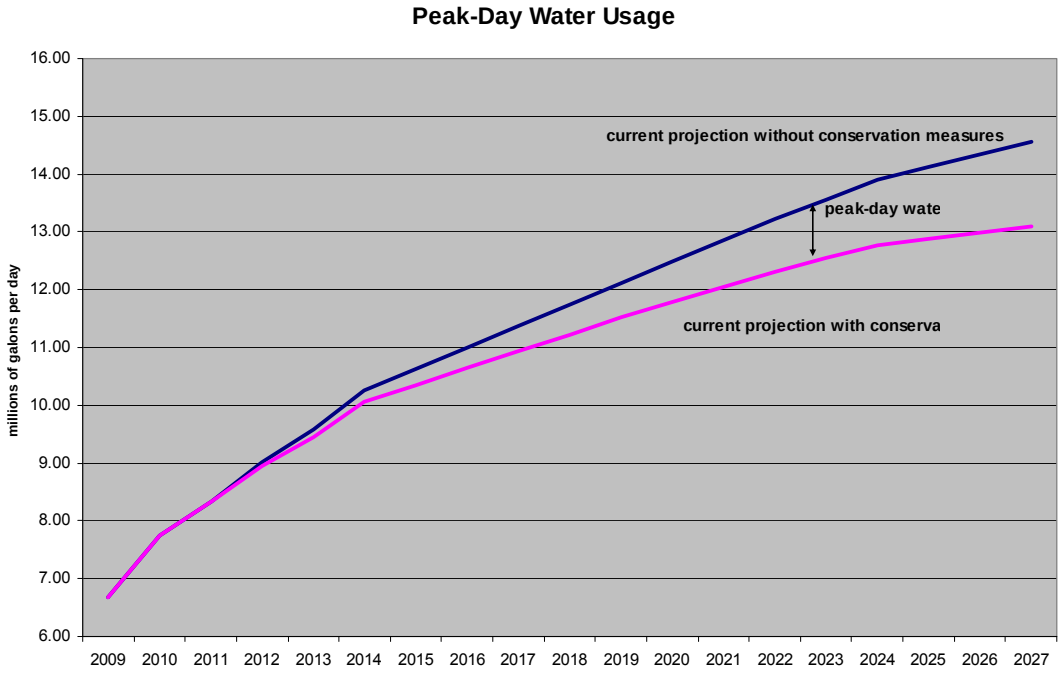
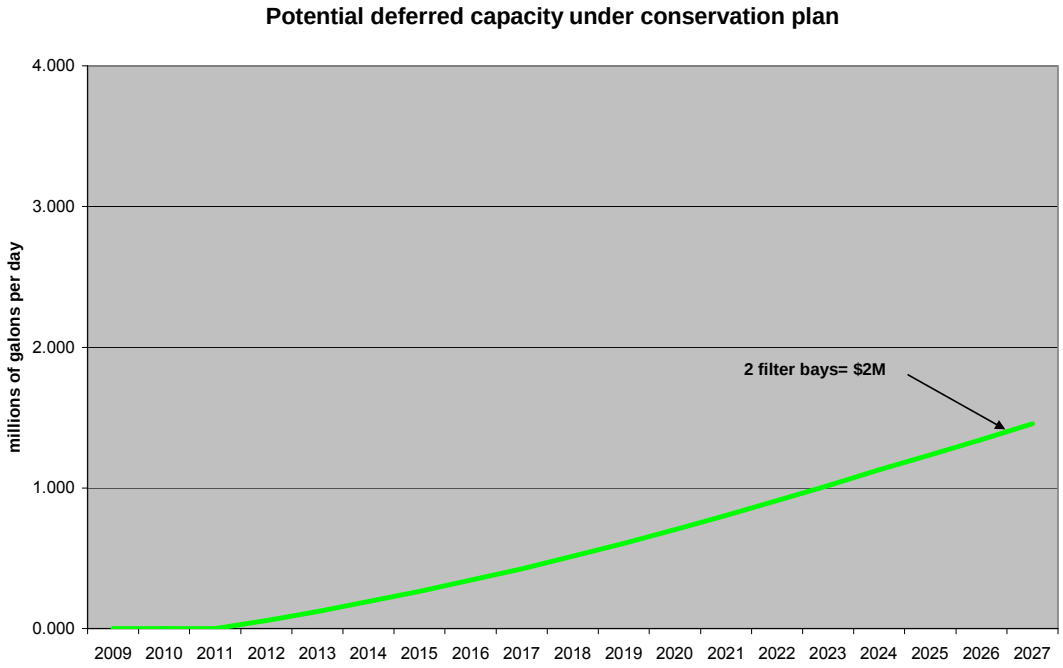


Figure 1.2 shows projected peak demand residential water use in million gallons per day by year without water conservation (blue line) compared to water use with water conservation (red line) at targets outlined above.

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.

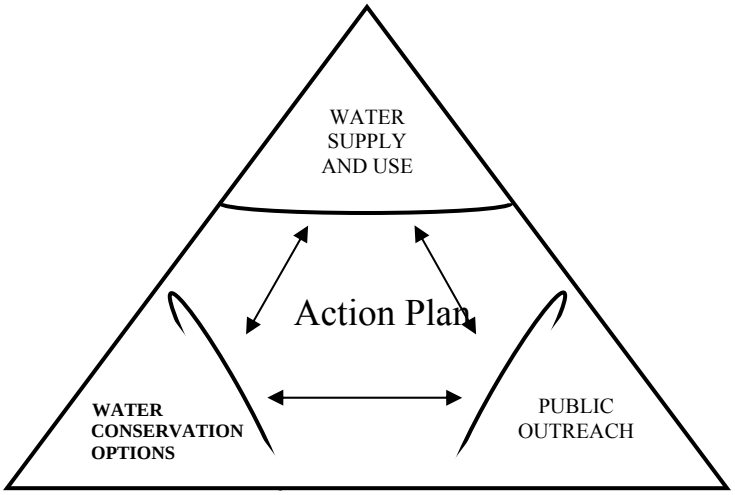
1. Direct operating and maintenance costs of water treatment and distribution, such as pumping (electrical) and chemical costs, are directly proportional to water demand. Reductions in water use, particularly on peak-demand days of summer, can reduce electric power and chemical feed costs.
2. Conservation 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

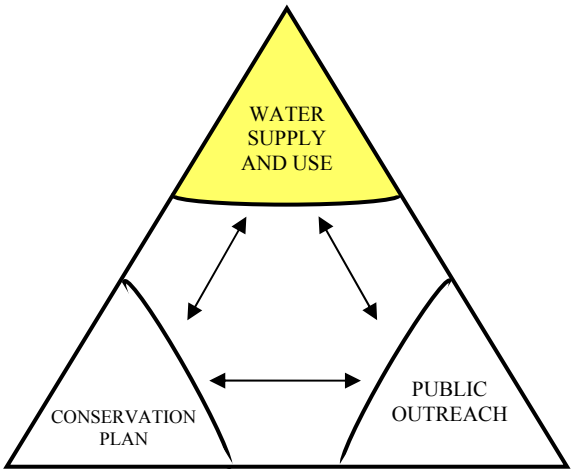
1.5 Developing a Comprehensive Water Conservation Plan



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.

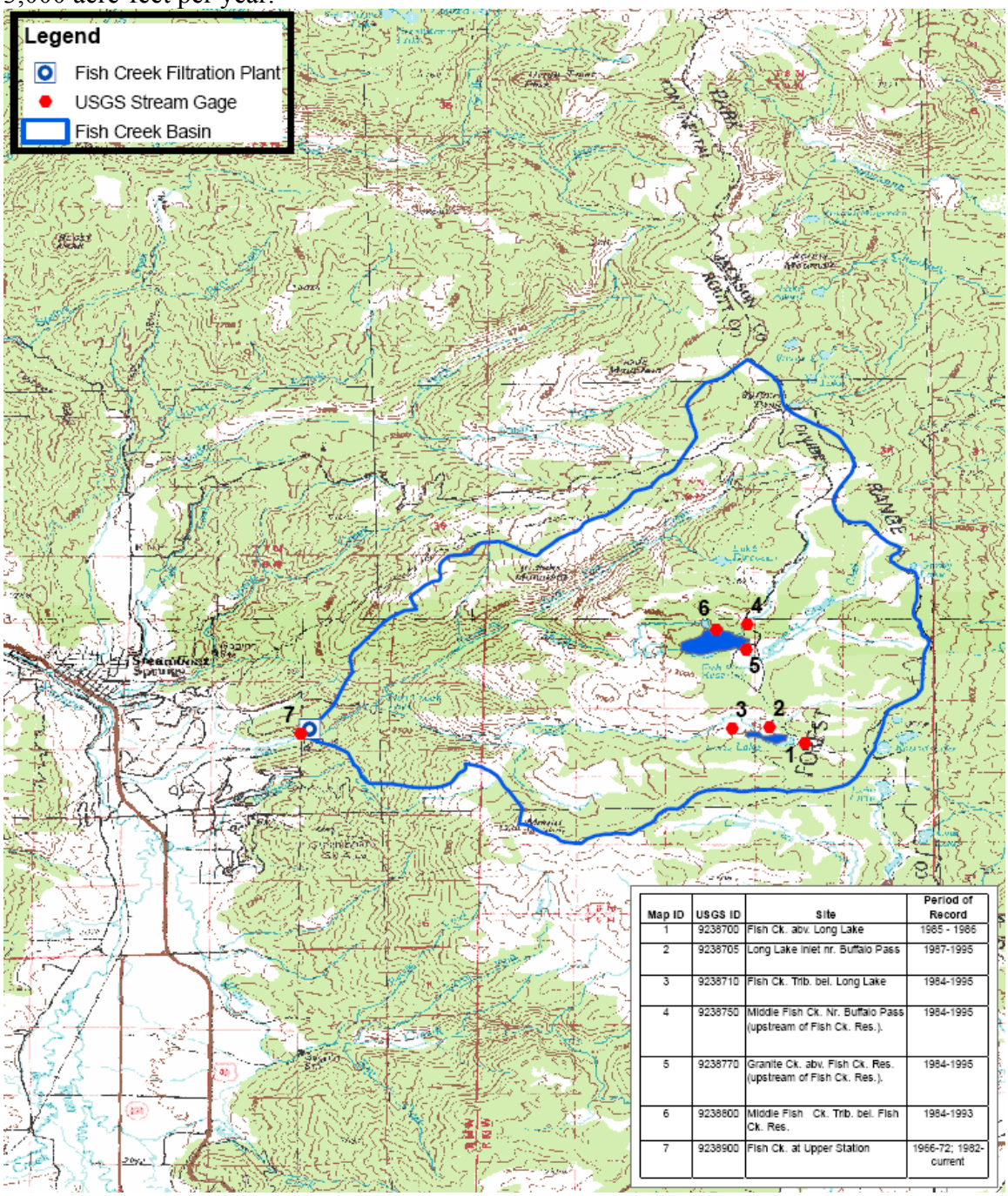
2.0 WATER SYSTEM PROFILE – UNDERSTANDING THE RESOURCE

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

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.



Map ID	USGS ID	Site	Period of Record
1	9238700	Fish Ck. abv. Long Lake	1985 - 1986
2	9238705	Long Lake Inlet nr. Buffalo Pass	1987-1995
3	9238710	Fish Ck. Trib. bel. Long Lake	1984-1995
4	9238750	Middle Fish Ck. Nr. Buffalo Pass (upstream of Fish Ck. Res.).	1984-1995
5	9238770	Granite Ck. abv. Fish Ck. Res. (upstream of Fish Ck. Res.).	1984-1995
6	9238800	Middle Fish Ck. Trib. bel. Fish Ck. Res.	1984-1993
7	9238900	Fish Ck. at Upper Station	1966-72; 1982-current

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

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

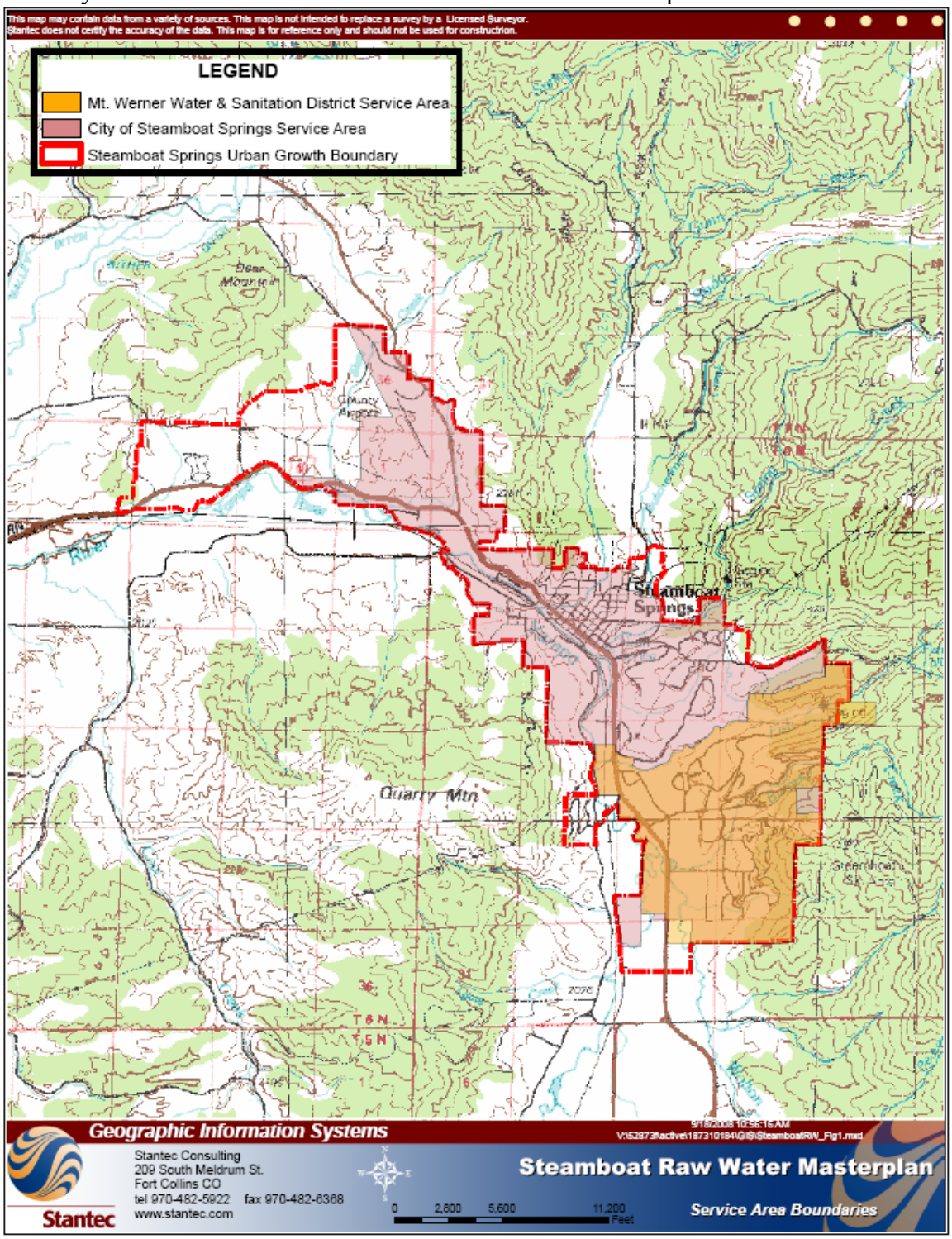


Figure 2.2 Water Supply Service Area Map from Steamboat Water Supply Master Plan, Nov. 2008

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

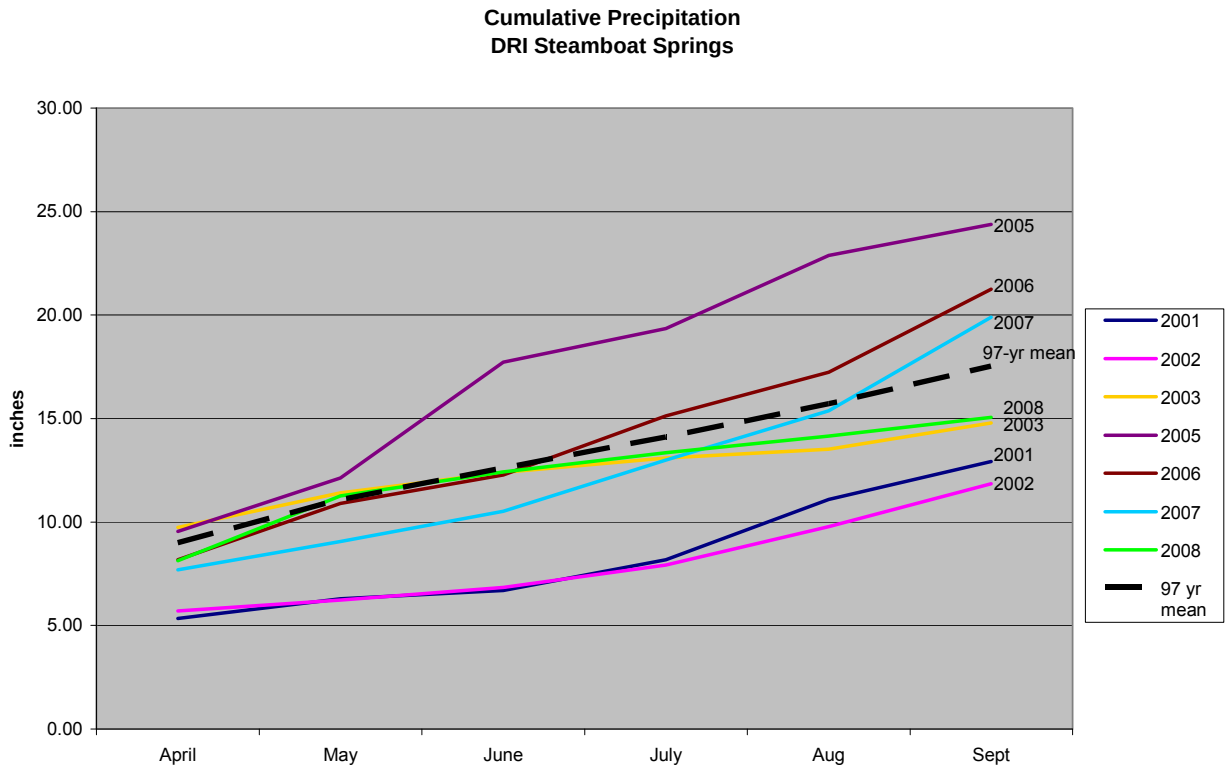
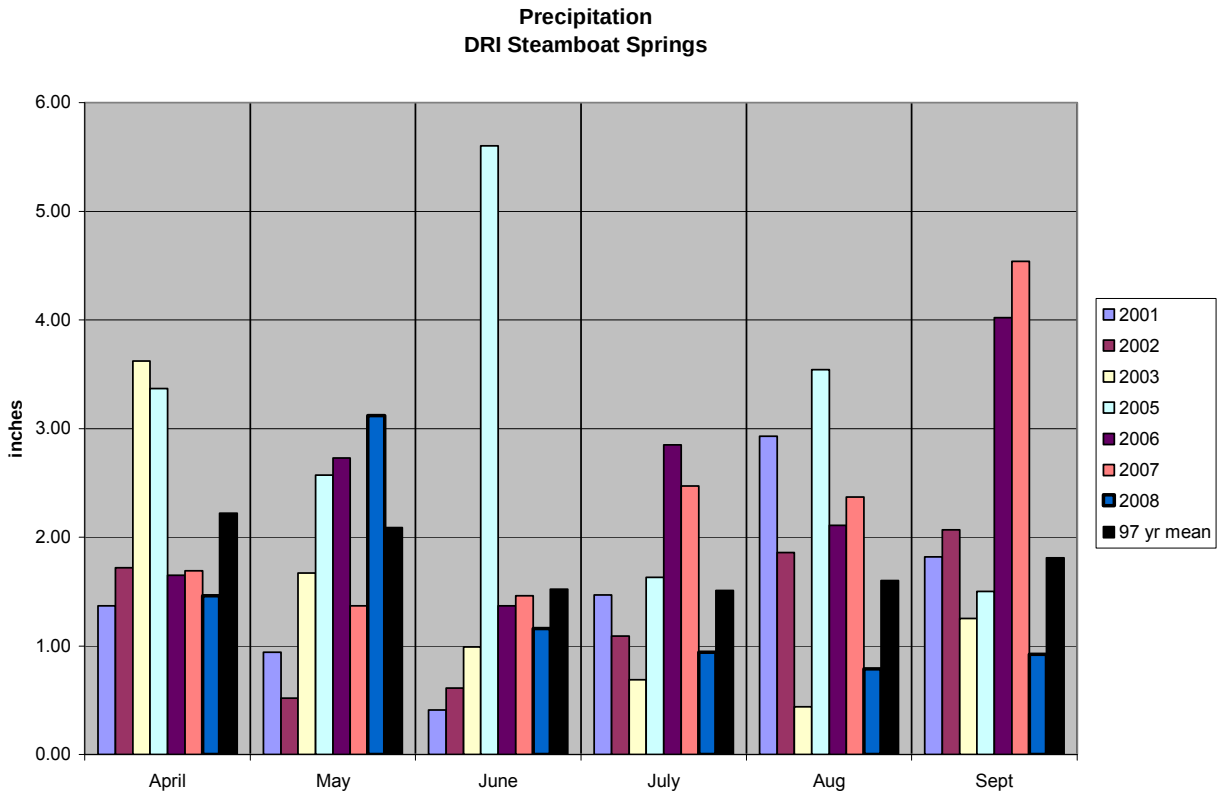


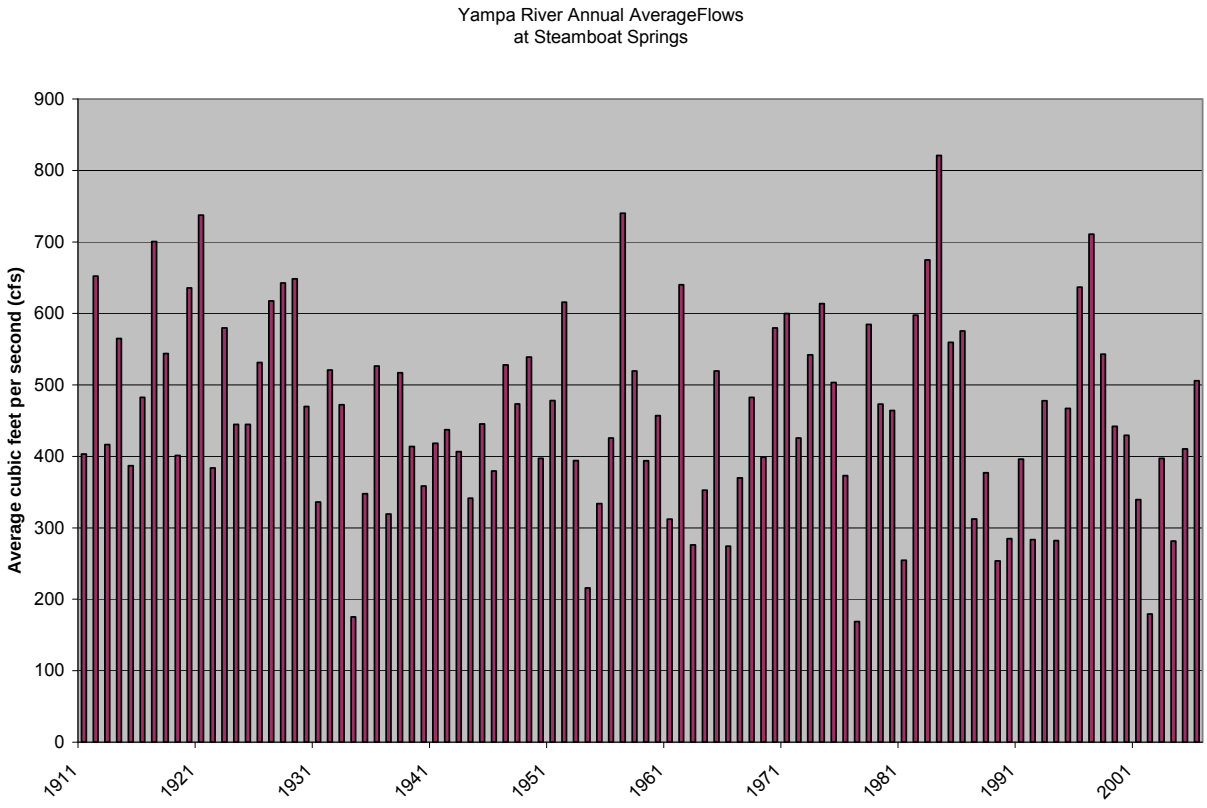
Figure 2.4 Steamboat Springs Precipitation



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.

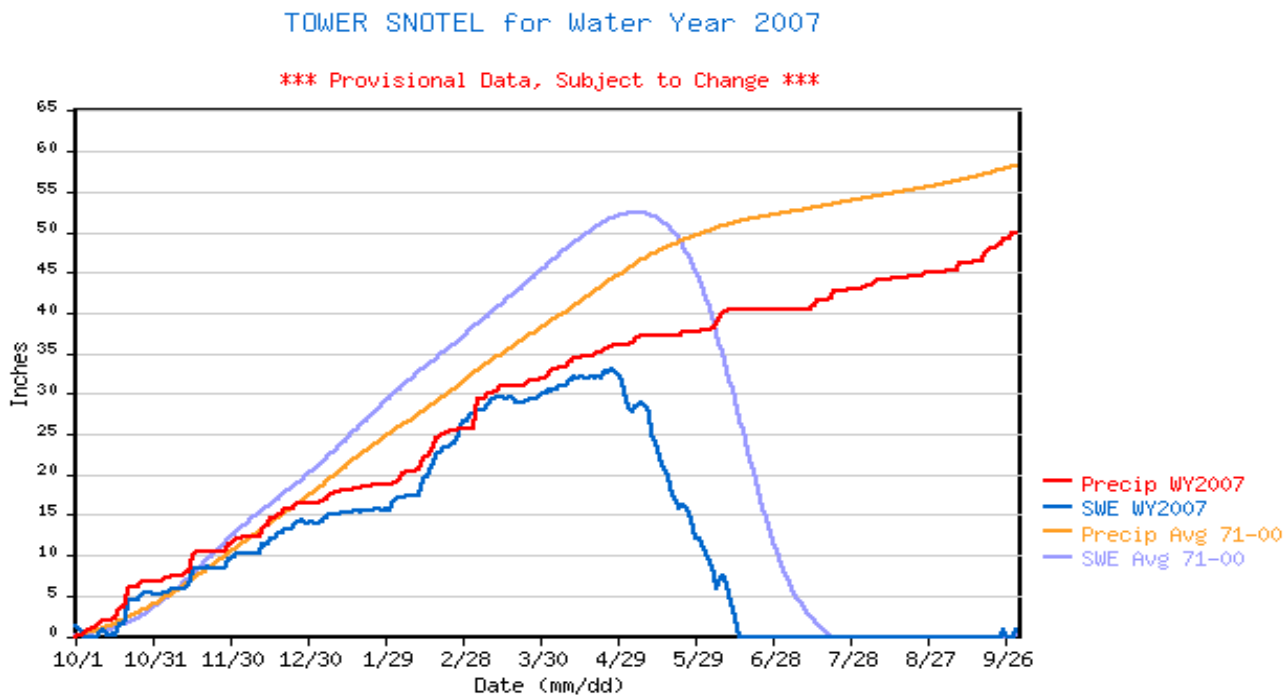
Figure 2.5 Yampa River Flow



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.

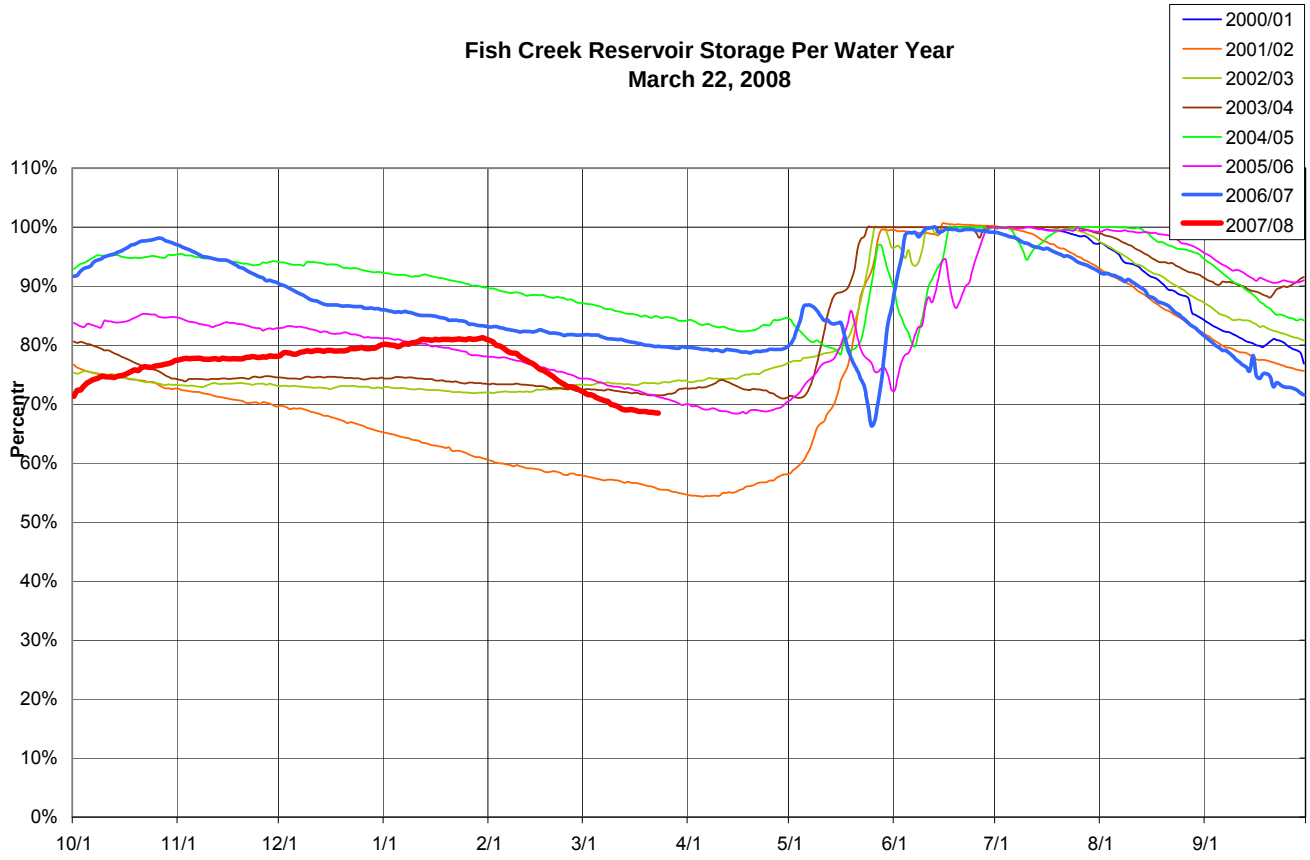
Figure 2.6 2007 Snotel Data



2.3 Storage Rights

The City and the District each have water storage rights in the Fish Creek Basin. The City has a 396 AF storage right in Long Lake. The City and the District each own significant storage rights for Fish Creek Reservoir. The current capacity of Fish Creek Reservoir is over 4,000 AF. The City and the District own absolute rights to fill that amount, as well as conditional rights for additional storage. In addition, the Colorado Division of Wildlife and the CWCB have certain rights to storage in Fish Creek Reservoir.

Figure 2.7 Fish Creek Reservoir Storage

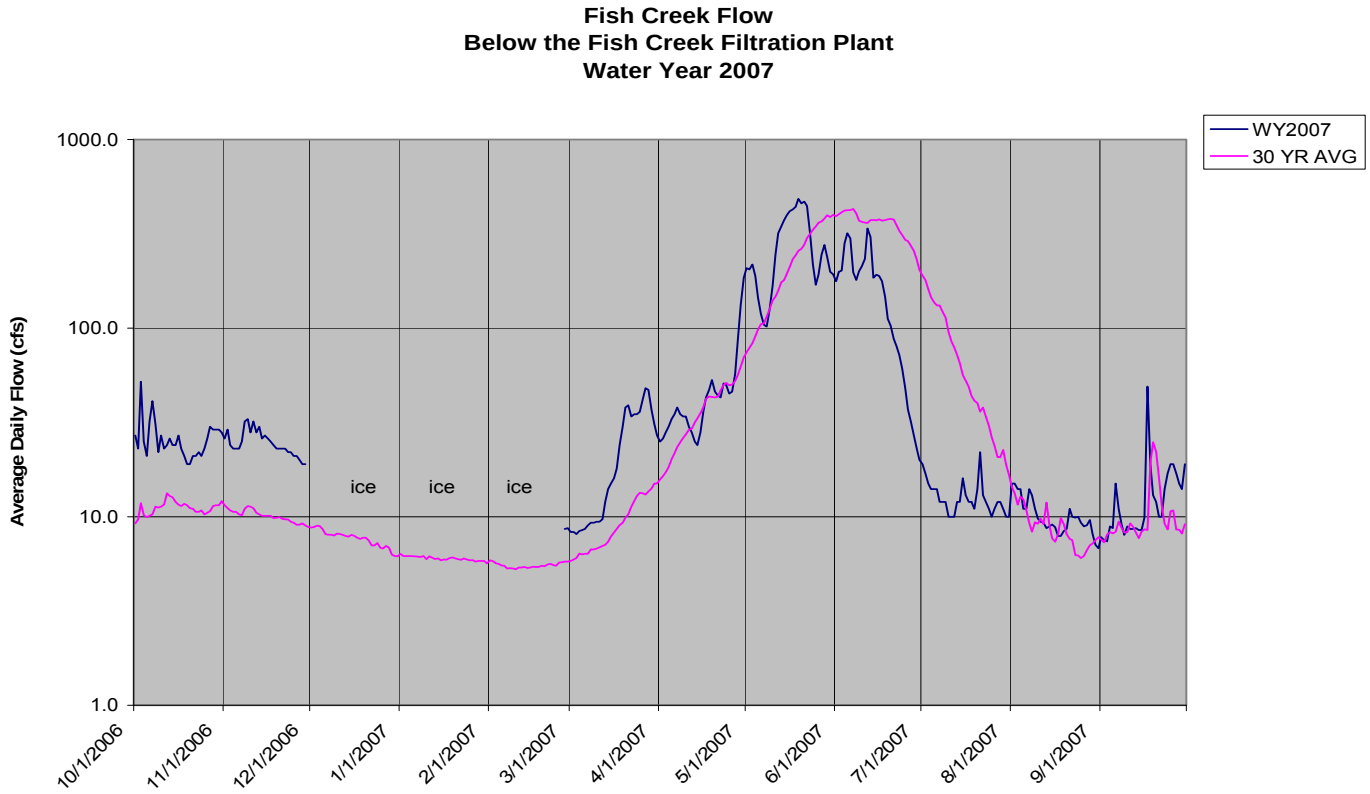


2.4 Direct Flow Water Rights

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 each own part of the most senior in-stream water right on Fish Creek, the Hoyle & Knight Ditch 8.3 cfs (1889) .

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 smaller areas near the old town 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 had 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 1958, a group of local businessmen and ski pioneers began to develop a ski resort three miles south of old city limits on Storm Mountain – later, re-named Mount Werner. 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 ski resort 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.

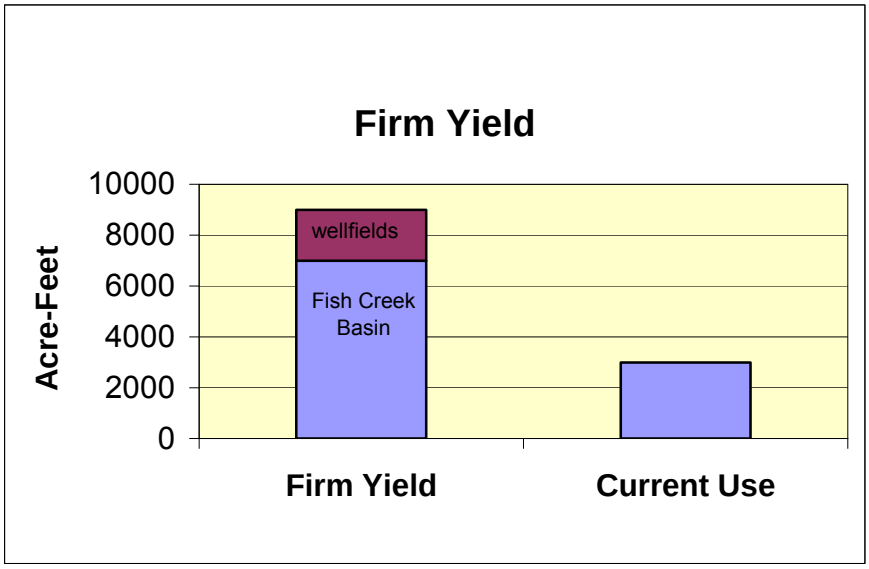
Steamboat II Metropolitan District (SIIMD) is outside city limits. The SIIMD currently purchases 4.5 million gallons/month of water from the City of Steamboat Springs. It serves the Steamboat II, Heritage Park and Silver Spur neighborhoods. The Steamboat II development was originally built in the late 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

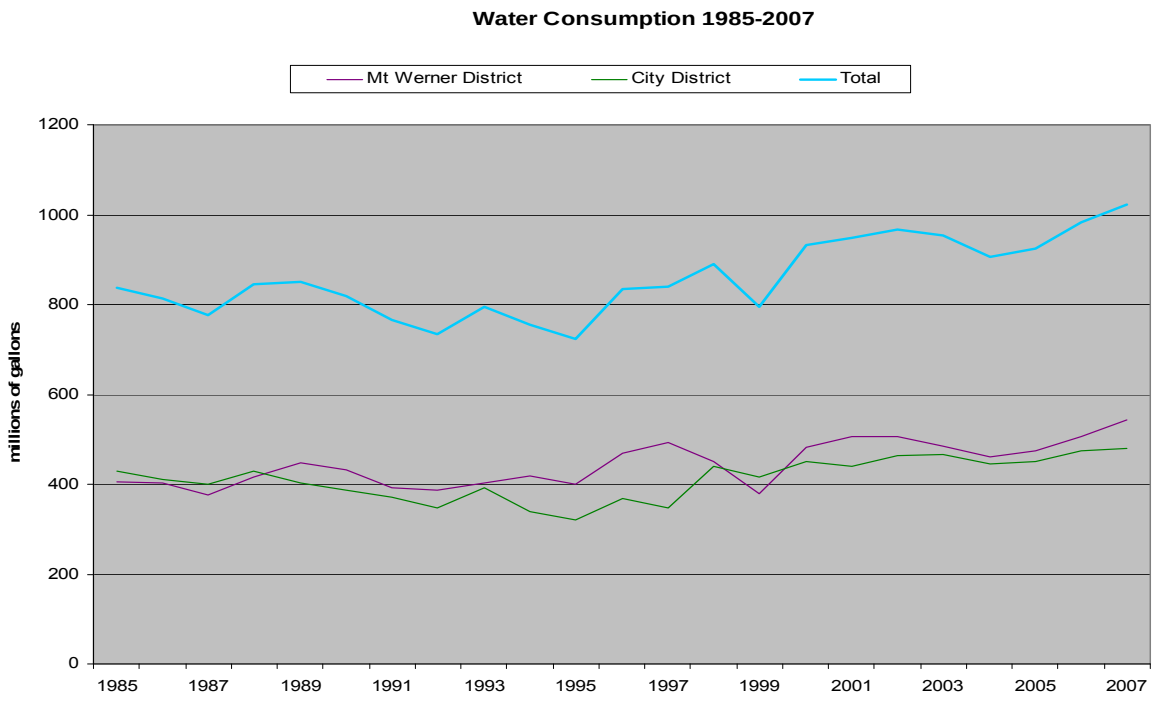
The City and MWW share two sources of treated water supply, the Fish Creek Filtration Plant (7.5 MGD capacity) and the Yampa River Infiltration Galleries/Filtration Plant (1.8 MGD capacity). The Fish Creek plant was constructed in 1971, and expanded in 1983, 2000 and 2007. It uses conventional filtration, and currently has ten filter bays with a capacity of 7.5 MGD. Over time, the plant capacity can be expanded from 7.5 MGD to 12 MGD. The Fish Creek plant is in good condition and is well-maintained. The Yampa Wellfield System has the potential for expansion from 1.8 MGD to 3.3 MGD. If there were to be a wildfire in the Fish Creek Basin that contaminated or depleted the water source or a major failure at the Fish Creek Filtration Plant, the wellfields could support the basic needs of the current population. However, to ensure an adequate supply of safe drinking water to this growing 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 Appendix E.)

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 can triple 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

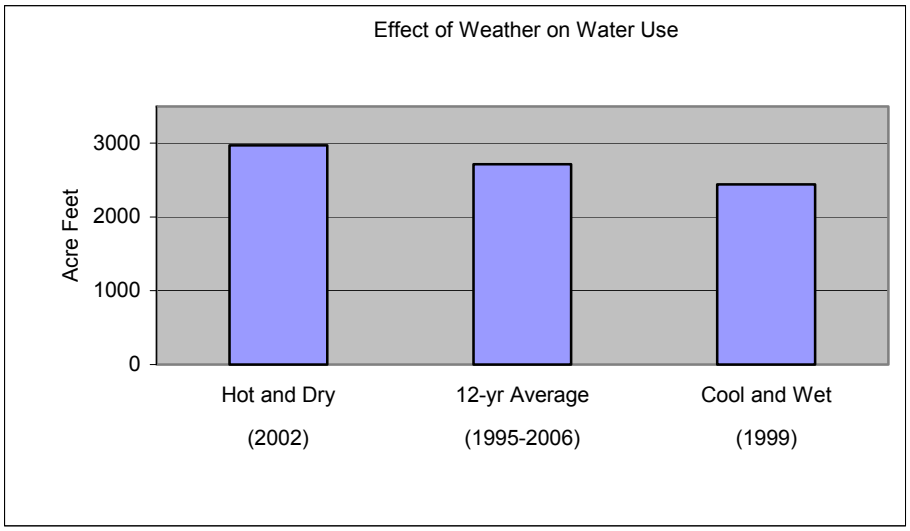
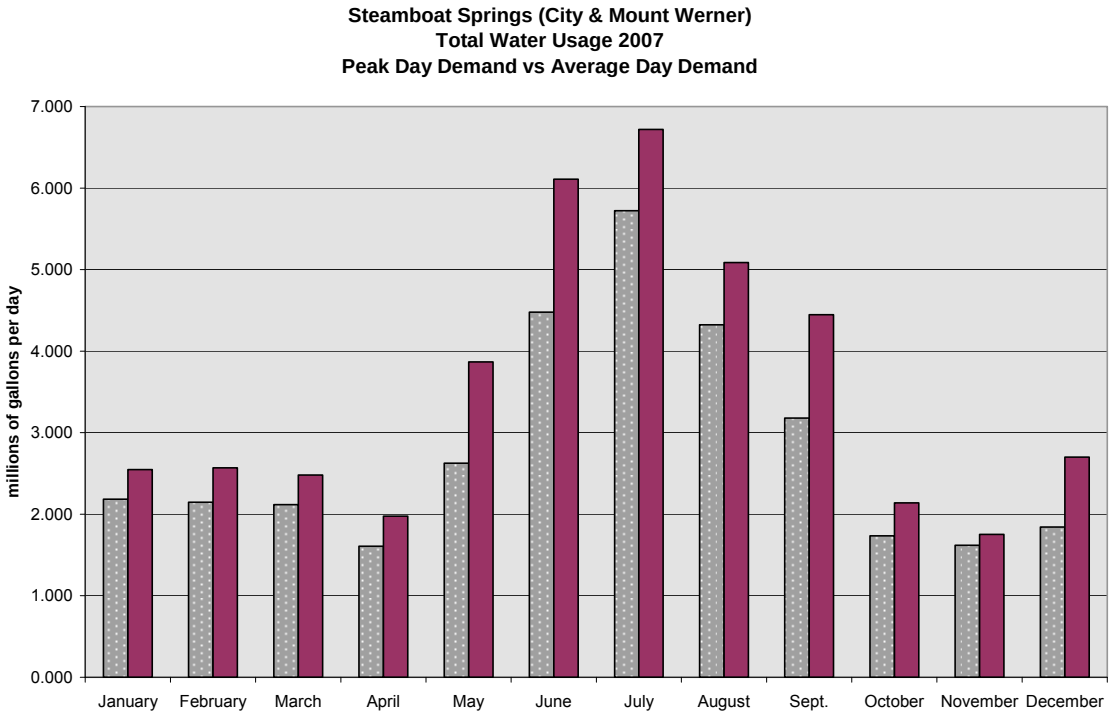
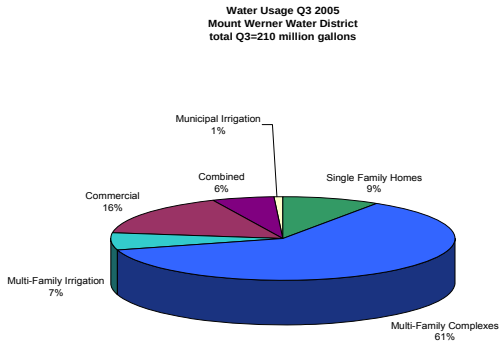


Figure 3.4 2007 Water Usage



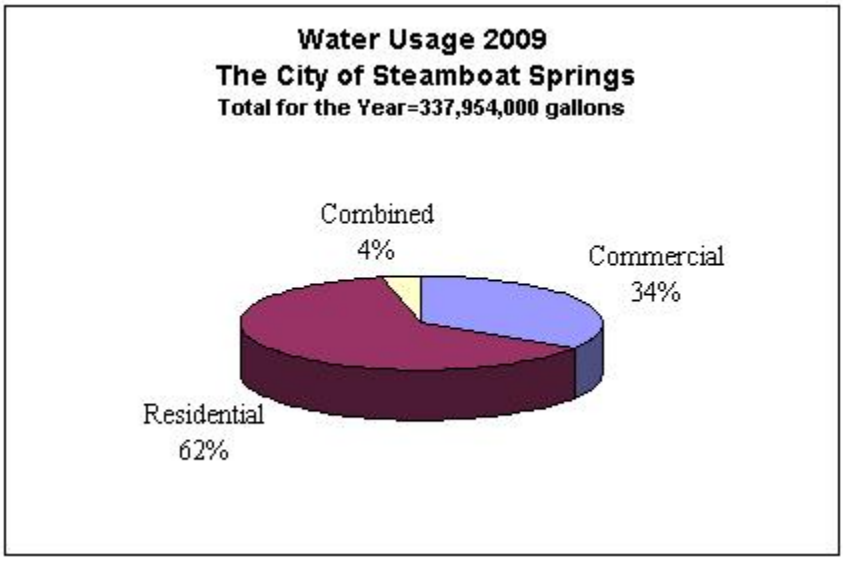
The current average water use in the Steamboat Springs community is 3,000 AF in a service area roughly 10 square miles. The served population is different than that of traditional rural communities in that the resort area served by MWW includes a transient population of part-time residents with second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

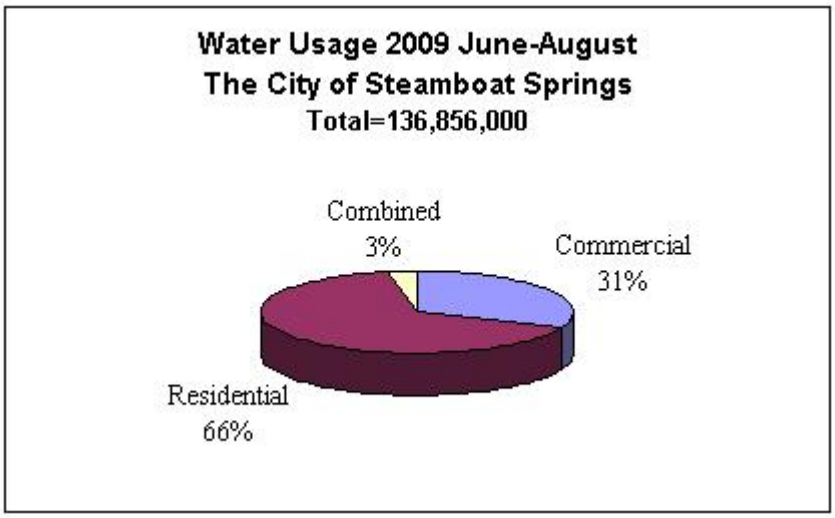
Figure 3.5 Water Usage Breakdown – MWW



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 (figure 3.7). 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 and bills users in two categories, either Commercial or Residential (figure 3.8). 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.

Figure 3.7 represents the retail delivery for the City of Steamboat Springs by customer class. The data represented is from the billing usage summary reports, available from the Water Billing Technician in the Finance Department. The amount of water sold in 2009 is less than in 2008 and reflects the downturn in population due to a depressed economy. Residential customers are by far the City's largest customer class with Combined being the least populated category. For this plan, these are the only classes being tracked. In 2011, a commercial irrigation category will be added but data for this customer class is not yet available.

Figure 3.7 Retail Water Delivery by Volume for each Customer Class- City

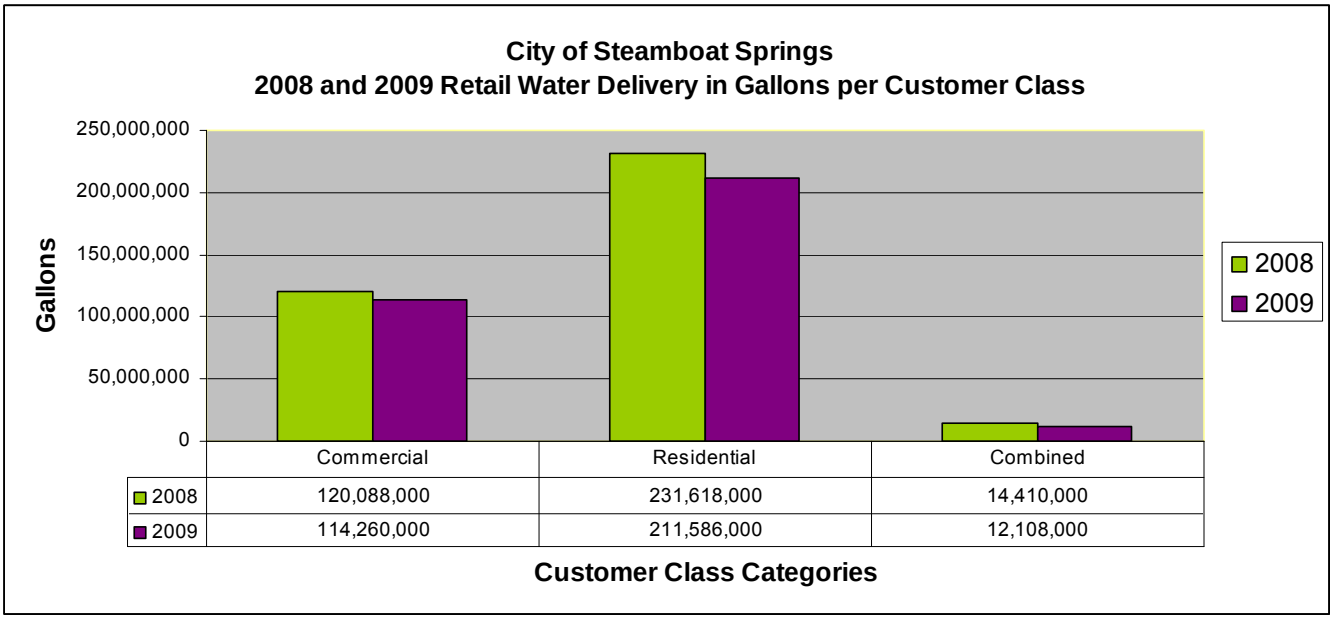
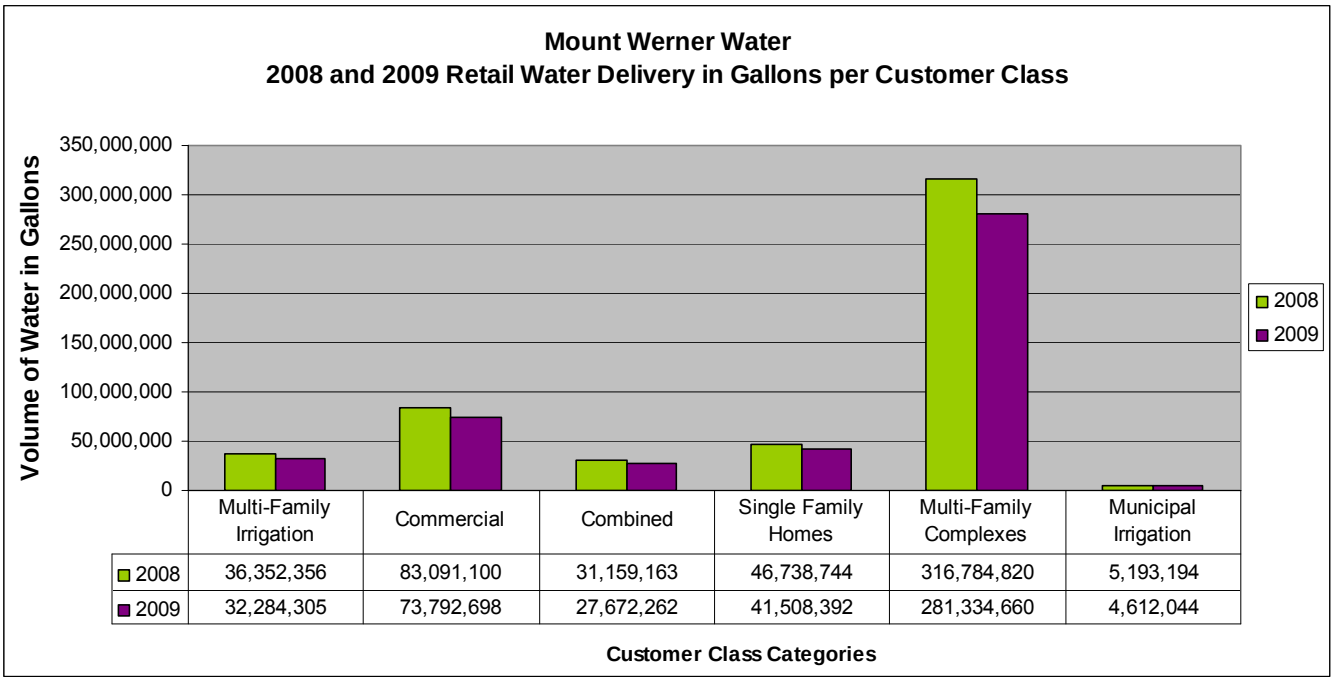


Figure 3.8 represents data for the Mount Werner Water District. The District doesn't specifically track all of these categories but does have a general knowledge of percentage each one of these categories represents. The knowledge is based on the 2005 Rate Study, where it was determined that each category represents the following percentage.

MWW	
Customer Classes	Percent of Total
Multi-Family Irrigation	7%
Commercial	16%
Combined	6%
Single Family Homes	9%
Multi-Family Complexes	61%
Municipal Irrigation	1%

To then determine the specific gallon amount for each class, the percentages were used to extrapolate gallon amounts from the total gallons sold in 2008 and 2009. The amount of retail water delivery in 2008 for MWW is 519,319,377 gallons. In 2009 that number dropped to 461,204,360 gallons. Therefore this chart represents the approximate gallons amount used by each type of customer. The billing information data is available from the MWW district offices.

Figure 3.8 Retail Water Delivery by Volume for each Customer Class- MWW



	Multi-Family Irrigation	Commercial	Combined	Single Family Homes	Multi-Family Complexes	Municipal Irrigation
2008	36,352,356	83,091,100	31,159,163	46,738,744	316,784,820	5,193,194
2009	32,284,305	73,792,698	27,672,262	41,508,392	281,334,660	4,612,044

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 Section 4.0, the current modest growth rate reflects the economic downturn; however, the continued growth in tourism and second home ownership in the resort area, residential development west of the old town, and residential infill in the old town may combine to increase demand 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 and MWW are well-prepared to handle water main breaks because their water distribution systems are interconnected. The City is served with five storage tanks with a combined volume of 4.5 million gallons. MWW is served by eight storage tanks with a combined volume of 5.65 million gallons. Additional storage tanks are included in the master plans of both entities.

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
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	None

	consumption (average of 1st and 4th quarter water use) ($0.20/ m^3 collection + $0.70/ m^3 treatment = $0.90/ m^3)	

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 D). 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 3-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 3-bedroom/2-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 are combined as follows: Residential includes single family homes and multi-family complexes including any dwelling with a full kitchen plus associated irrigation; Commercial and Combined categories remain as defined above.

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

Existing Number of Units						
	City		MWW		SBT II	
Customer Class	% Water Use	EQR	% Water Use	EQR	% Water Use	EQR
Commercial	33	1,765	17	1,151	0	0
Residential	61	3,262	77	5,214	100	406
Combined	6	321	6	406	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	Average gpd per EQR
2004	232	231	232
2005	230	232	231
2006	241	241	241
2007	237	247	242
4-Year 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

	Tri District: Existing Combined Units	EQR(equivalent residential unit)	EQR Totals	Total Gallons per day average	Percentage of Water Use
Commercial	2,916	1.1	230	670,292	23%
Residential	8,881	1	209	1,856,200	71%
Combined	727	1	209	151,960	6%
Total number of Units	12,524			2,678,452	

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 represents 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%

Table 4.5 Projections by Customer Class

Year	Commercial	Residential	Combined	Total
EQR	1.10	1.00	1.00	
	230	209	209	
2009	2,916	8,881	727	12,524
2010 (0.1% Total Growth Rate)	2,921	8,888	727	12,537
2011(0.4% Total Growth Rate)	2,933	8,924	730	12,587
2012(0.8% Total Growth Rate)	2,956	8,995	736	12,687
2013 (1.69% Total Growth Rate)	3,006	9,147	748	12,902
2014 (1.69% Total Growth Rate)	3,057	9,302	761	13,120
2015 (1.69% Total Growth Rate)	3,109	9,459	774	13,342
2016 (1.69% Total Growth Rate)	3,161	9,619	787	13,567
2017 (1.69% Total Growth Rate)	3,215	9,782	800	13,796
2018 (1.69% Total Growth Rate)	3,269	9,947	814	14,029
2019 (1.69% Total Growth Rate)	3,324	10,115	827	14,267
2020 (2% Total Growth Rate)	3,391	10,317	844	14,552
2021 (2% Total Growth Rate)	3,458	10,524	861	14,843
2022 (2% Total Growth Rate)	3,528	10,734	878	15,140
2023 (2% Total Growth Rate)	3,598	10,949	896	15,443
2024 (2% Total Growth Rate)	3,670	11,168	914	15,751
2025 (2% Total Growth Rate)	3,743	11,391	932	16,066
2026 (2% Total Growth Rate)	3,818	11,619	950	16,388

2027 (2% Total Growth Rate)	3,895	11,851	970	16,716
2028 (2% Total Growth Rate)	3,973	12,088	989	17,050
2029 (2% Total Growth Rate)	4,052	12,330	1,009	17,391
2030 (2% Total Growth Rate)	4,133	12,577	1,029	17,739
2031 (2% Total Growth Rate)	4,216	12,828	1,049	18,093
2032 (2% Total Growth Rate)	4,300	13,085	1,070	18,455
2033 (2% Total Growth Rate)	4,386	13,347	1,092	18,824
2034 (2% Total Growth Rate)	4,474	13,613	1,114	19,201
2035 (2% Total Growth Rate)	4,563	13,886	1,136	19,585

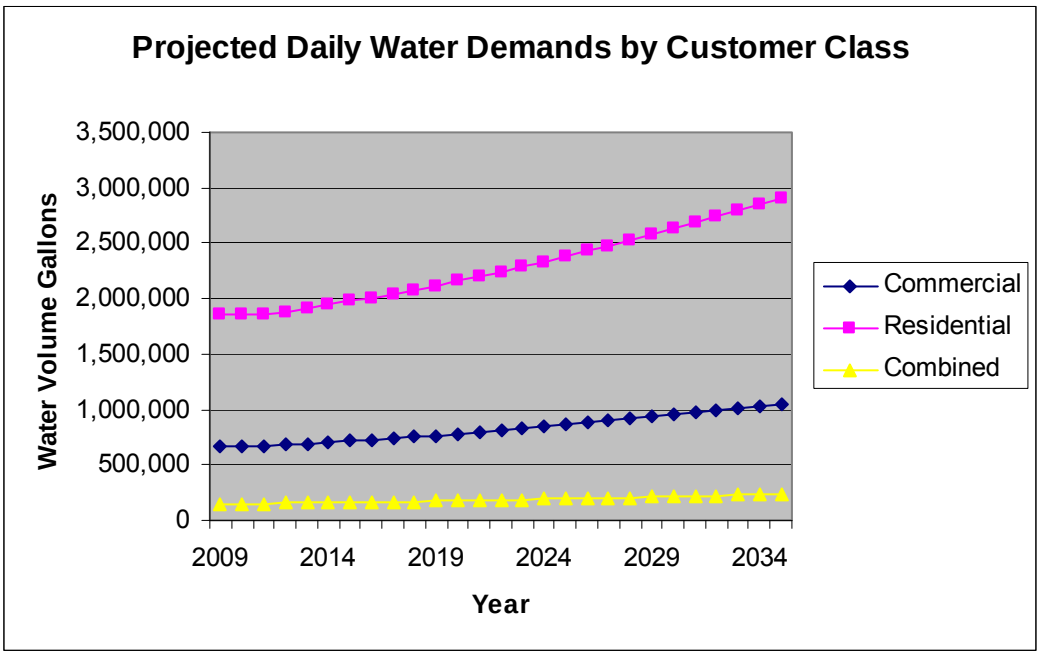
Table 4.5b.Projected Water Demand by Customer Class in Gallons for Both Districts

	Commercial	Residential	Combined	Total Demand per day (gallons)	Total Demand per year (gallons)	PRODUCED Demand based on 15% loss	Acre Feet
2009	670,388	1,856,129	151,943	2,678,460	977,638,046	1,124,283,753	3,450
2010	671,832	1,857,675	151,968	2,681,475	978,738,276	1,125,549,017	3,454
2011	674,520	1,865,105	152,576	2,692,201	982,653,229	1,130,051,213	3,468
2012	679,916	1,880,026	153,796	2,713,738	990,514,455	1,139,091,623	3,496
2013	691,406	1,911,799	156,395	2,759,600	1,007,254,149	1,158,342,271	3,555
2014	703,091	1,944,108	159,038	2,806,238	1,024,276,744	1,177,918,256	3,615
2015	714,973	1,976,963	161,726	2,853,663	1,041,587,021	1,197,825,074	3,676
2016	727,056	2,010,374	164,459	2,901,890	1,059,189,842	1,218,068,318	3,738
2017	739,344	2,044,349	167,239	2,950,932	1,077,090,150	1,238,653,672	3,801
2018	751,839	2,078,899	170,065	3,000,803	1,095,292,974	1,259,586,920	3,866
2019	764,545	2,114,032	172,939	3,051,516	1,113,803,425	1,280,873,938	3,931
2020	779,836	2,156,313	176,398	3,112,547	1,136,079,493	1,306,491,417	4,009

2021	795,432	2,199,439	179,926	3,174,797	1,158,801,083	1,332,621,246	4,090
2022	811,341	2,243,428	183,524	3,238,293	1,181,977,105	1,359,273,671	4,171
2023	827,568	2,288,297	187,195	3,303,059	1,205,616,647	1,386,459,144	4,255
2024	844,119	2,334,063	190,939	3,369,120	1,229,728,980	1,414,188,327	4,340
2025	861,001	2,380,744	194,758	3,436,503	1,254,323,559	1,442,472,093	4,427
2026	878,222	2,428,359	198,653	3,505,233	1,279,410,031	1,471,321,535	4,515
2027	895,786	2,476,926	202,626	3,575,338	1,304,998,231	1,500,747,966	4,606
2028	913,702	2,526,464	206,678	3,646,844	1,331,098,196	1,530,762,925	4,698
2029	931,976	2,576,994	210,812	3,719,781	1,357,720,160	1,561,378,184	4,792
2030	950,615	2,628,534	215,028	3,794,177	1,384,874,563	1,592,605,747	4,888
2031	969,628	2,681,104	219,329	3,870,060	1,412,572,054	1,624,457,862	4,985
2032	989,020	2,734,726	223,715	3,947,462	1,440,823,495	1,656,947,020	5,085
2033	1,008,800	2,789,421	228,190	4,026,411	1,469,639,965	1,690,085,960	5,187
2034	1,028,976	2,845,209	232,753	4,106,939	1,499,032,765	1,723,887,679	5,290
2035	1,049,556	2,902,113	237,408	4,189,078	1,529,013,420	1,758,365,433	5,396

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 Appendix D.

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).

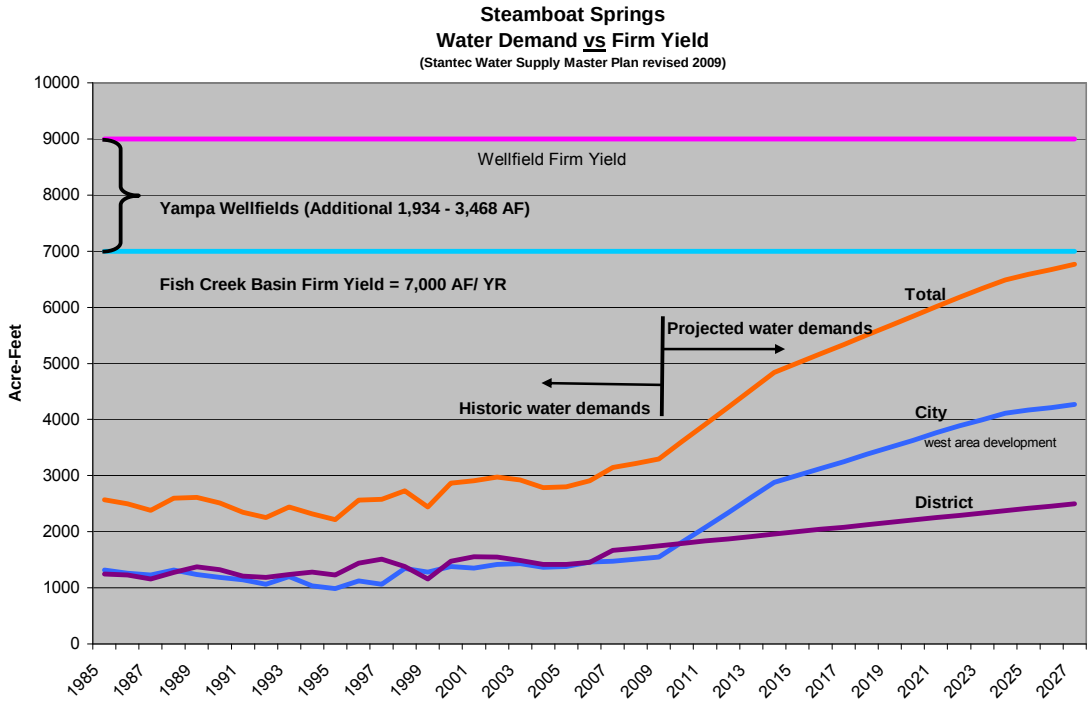
Uncertainties for long range water supply planning include the possibility of a Colorado Compact call, a large scale fire in the Fish Creek basin, annexation of land and related development west of Steamboat Springs, climate change, and extended drought. These uncertainties make an even stronger case 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**	
	Average Day (mgd)	**Average Day (mgd)**	**Average Day (mgd)**	**Annual (AF/yr.)**
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) *includes west of Steamboat demand 1.66 mgd				**769 (w/o storage)** **1,000 – 3,000 (depending upon amount of storage Developed)**

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
  - Dishwashers
    - Older models use up to 13 gal/wash vs. new models avg. 4 gal.

    - Clothes washers
        - Older models use up to 40 gal/wash vs. new model avg. 27 gal.
    - Install on-demand hot water heaters or hot water circulating pumps.
- Behavioral changes
    - Take shorter showers
        - A five-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; 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 June15th 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

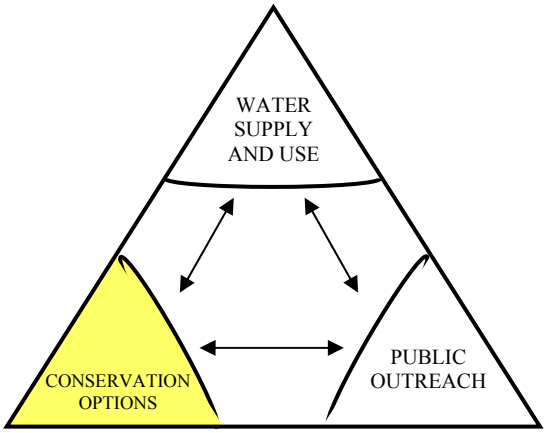
- Set and communicate goals, targets.
- Inspect distribution system to reduce losses.
- Improve metering accuracy and efficiency.
    - Retrofit meters with wireless meter reading transponders.
- Reduce un-metered use.
- Adopt a conservation-minded rate structure.
- User education
    - General user 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.
    - Employ 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 Appendix A. 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 for "covered entities" as defined by C.R.S.§37-60-126. However, together they supply 3000 acre-feet to their combined constituencies through a 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 10 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 promoting towel and bedsheet reuse. In 2006, MWW donated tent cards and placards from Project Planet to six motels in the area and provided the managers with information about how to procure additional materials 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.
At the City of Steamboat Springs wastewater treatment plant, reclaimed water, which is non-potable, treated wastewater effluent, is used to irrigate landscaping around the facility and approximately 100 acres of hay meadows.

Future Reclaimed Water Use
Using treated wastewater for irrigation on City parks and sports fields is not a feasible option for the City of Steamboat Springs and MWW. The main reason is that the treatment plant is located two miles outside the city limits, a long distance from the majority of the irrigated parks. The plant treats wastewater from many separate distribution systems including Tree Haus, MWW, City of Steamboat Springs, Steamboat II and Sleepy Bear trailer park. This distant location was chosen in order to eliminate the need for those smaller districts to have individual treatment plants for their systems; however, the distance makes using reclaimed water cost prohibitive. The cost associated with installing reclaimed water infrastructure would be significant: pipes at this elevation and climate are required to be buried 7 feet to prevent freezing; many miles of pipe would be required; lastly, the system would require a pump facility to pump the water uphill. All of these reasons make a reclaimed water system cost prohibitive.

The City of Steamboat Springs holds senior water rights on several tributaries of the Yampa River which are adjacent to or nearby City parks and sport fields. The City should expand its use of these water rights for irrigating our parks and sports fields before considering the expense of building a reclaimed water system.

Suggested Additions to the Program
If Routt County were to allow for on-site greywater reuse systems, 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 could also consider water reuse (greywater) 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 can result in a higher rate of draw-down of reservoir water and in lower flows in Fish Creek and the Yampa River, though some subsurface leakage from water mains and service lines 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 past several years, MWW and the City have established programs to improve metering of its customers and to 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.

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 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.

Every fall, the MWW District hosts elementary 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 children 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 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 (2011 Budget $12,000) to support its conservation initiatives. The revenue collected from the highest rate tier 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 COST BENEFIT ANALYSIS, SCREENING AND SELECTION OF WATER CONSERVATION PLAN COMPONENTS

7.1 Master List of Water Conservation Measures & Programs

A master list of water conservation measures and programs was prepared for review and appears in Table 7.1. 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 selected 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 the initial list because of legal and regulatory limitations placed on these activities in Colorado.

TABLE 7.1 Conservation Programs/Measures - Master List for Initial Screening

Conservation Programs/ Measures *	**Existing SS**	**Existing MWW**	**Existing SII**	**Further Evaluation**	**Further Evaluation**	**Further Evaluation**	**Comments**
	Y/N	**Y/N**	**Y/N**	**SS**	**MWW**	**SII**	
U1. Active leak detection employing sonic or other remote sensing technology	n	n	Y	y	Y	continue	-City - not at this time. City will consider employing sonar leak detection biannually. City will continue to replace pipe annually. -MWW- not at this time, however, will continue to replace 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 and replace 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 conducting rate study, looking at lower thresholds for tier structure. -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 with Sensus meter reading software. Caselle billing software is utilized. -MWW is deploying Aclara wireless system, currently at 50%.complete. Use Caselle billing. -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

Conservation Programs/ Measures *	**Existing SS**	**Existing MWW**	**Existing SII**	**Further Evaluation**	**Further Evaluation**	**Further Evaluation**	**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 no parks responsibility. -SBII 1.5 million gallons goes to parks.
U12. Irrigation requirements	n	n	N	n	N	N	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 plans to replace every meter in system - MWW responds to erratic meter readings and replaces as necessary. MWW deploying Aclara smart wireless meter reading system. -SBII has program planned to upgrade Badger to Sensus transponders
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.

Conservation Programs/ Measures *	**Existing SS**	**Existing MWW**	**Existing SIII**	**Further Evaluation**	**Further Evaluation**	**Further Evaluation**	**Comments**
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. -MWW has some components in place as does SBII
U17. Form Water Suppliers Group	n	n	n	y	Y	Y	-Include surrounding water districts
U18. Newsletters	y	y	Y	continue	Continue	continue	
E1. Website enhancements	y	y	N	y	Continue	maybe	Add evapotranspiration 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 seek grant monies to implement.
E3. Residential kit distribution	Did in past	n	N	n	N	n	-Many homes have been 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.

Conservation Programs/ Measures *	**Existing SS**	**Existing MWW**	**Existing SII**	**Further Evaluation**	**Further Evaluation**	**Further Evaluation**	**Comments**
E6. General public education programs -how to read bill -why monitor usage -benefits of behavior changes -website (practices/ savings, xeriscaping, plant list, ET irrigation info, etc.	y	y	Y	y	Y	Y	All would like to consider enhancements as staff and budget/grants become available
E7. Annual public open house: product info and availability	y	y	N	?	?	?	Held one in 2009, not good turnout. Possibly look at 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 Sustainable Biz Program and should be enhanced if grant funds become available- part of rebate 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 high users
E.12 Agricultural -collaborate with existing organizations	n	n	N	n	N	N	No opportunity within district boundaries
R1. Toilet replacement incentive	n	n	N	y	Y	Y	Would like to look into with grant assistance on a 50/50 basis: 2nd after irrigation
R2.	n	n	N	y	Y	Y	3rd priority

Conservation Programs/ Measures *	**Existing SS**	**Existing MWW**	**Existing SII**	**Further Evaluation**	**Further Evaluation**	**Further Evaluation**	**Comments**
Clotheswasher replacement incentive							
R3. Dishwasher replacement	n	n	N	y	Y	Y	4th priority
R4. Irrigation enhancement incentives	n	n	N	y	Y	Y	1st priority
R5. Commercial rebate program	n	n	N	n	N	N	Focus should be 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 an active search program to detect leaks in the water mains of the distribution system using sonar or other remote sensing technology.

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 mains per 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 for that water. In both districts the tiered rate structure for water billing applies to residential customers only. For the City, there is a base rate and five tiers of water volumes. At the threshold of each tier, there is a

higher price per 1,000 gallon. MWW includes a base rate and three tiers of water volumes 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 will also raise rates in the future to meet increased operating costs and repair and replacement 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 has already retrofitted over half of existing meters with wireless transponders, and expects to retrofit the remaining meters by the end of 2012.

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 activity has occurred to some extent in the past, but has not been an on-going program. The scope for this program is to issue quarterly messages for a ten-year period.

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): The Decorative Water Features Standards is applicable for the MWW district only; it not an issue within City. The focus will be on education and discouraging outdoor water features, possibly

through disincentives in the building code or specific tap fee. The goal of the program is to discourage the installation of 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 will be identified and recommendations made to improve system performance. This program 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 inquiries about water wastage, 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. Water Consumer Initiative (Stage 1 of Drought & Emergency Preparedness Plan): 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 June15th 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.
- Encourage cutting lawn grass no shorter than 3 inches to reduce soil moisture loss and to promote deeper roots.

- Limit the filling of swimming pools to one per year, unless draining for repairs is necessary.

U17. Form Water Suppliers Group: This program would create Water Suppliers Group consisting of the local and regional water supply and distribution providers to allow for better coordination in water conservation efforts; to share information about water savings program successes and challenges; and to 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 to 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 their 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 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: This program would distribute kits with tools and devices to help the homeowner identify and respond to water waste inside and outside the home.

E4. Irrigation / Xeriscape information: Irrigation / Xeriscape information is a program that provides education on best practices, rain sensors/ shut offs, efficient spray heads, and 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 targeting lodging properties, some of the largest users in the MWW district. Rebates may also be incorporated.

E9. Commercial/ Industrial education: This is a proposed education program targeting 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 targeting 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 targeting 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 the100 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.

7.2 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?

7.3 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 7.2).

In reference to U16, this program for purposes of implementation has been changed from Drought and Emergency Preparedness Plan (DEPP) to Water Consumer Initiative due to the fact that the DEPP is not considered a water conservation measure. Conservation measures listed in Stage 1 of the DEPP constitute the Water Consumer Initiative. The Drought and Emergency Response Plan is now located in Appendix G.

TABLE 7.2 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
4		City of Steamboat Springs										
5		Mount Werner Water										
6		Both Water Districts										
7		Removed										
8												
9		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
10	**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**	**Annual Revenue Loss**	**Estimated Annual Cost**	**Estimated Total cost over planning period**	**Cost per 1000 gallons saved**	**Rank**
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	Θ
20	U5. Hydrant testing /monitoring	10	$0	N/A	N/A	0	N/A	N/A	$1,110	$11,100	N/A	Θ
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	*

	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 guidelines)	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

	A	B	C	D	E	F	G	H	I	J	K	L
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 (leak detection and pipe replacement), a figure of 5280 LF was used to estimate costs; however, realistically each district will not perform these programs for more than 1,000 LF per year and not necessarily that amount per year for 10 years. Being a relatively new system, MWW replaces pipe principally to meet future capacity requirements as part of its capital improvements program.

Revenue Loss

Costs of conservation measures cited in columns 8 and 9 of Table 7.2 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 7.3 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

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

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

Table 7.4 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
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

TABLE 7.5 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 7.6 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.

7.4 Final Selection

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

TABLE 7.7 Recommended Ranking by Category
Utility Programs & Measures
** In progress but might need enhancements or CIP financing.*

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: Stage 1 (Water Consumer Initiative)
*	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
Θ	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)

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).

Currently the City and MWW are not engaging in an active leak detection program. The program in U1 is described as an active program using sonar technology. This type of program will hopefully be implemented in the future but it currently is not cost effective and therefore remains at a low ranking for implementation. However with time and improvements the effectiveness of sonar detection, and hopefully costs decreases, there will be more incentive to explore U1.

The City of Steamboat Springs did have past experience with Sonar technology used for leak detection and unfortunately it was not very rewarding. Approximately a decade ago, the City of Steamboat Springs decided to become more proactive about addressing leaks in the water distribution system. Therefore, the Utilities department hired a consultant, who specialized in sonar leak detection. He performed an analysis along the Yampa River bottom lands, in Fairview and in all of the West Steamboat area. These are the areas where hot soils occur and cause accelerated metal pipe corrosion, leading to a significant amount of leaks. The consultant work lasted a few days and at the end of that time he reported to 2 leaks at specific locations. In response, the Utilities crew excavated both locations, however found no leaks. Therefore, the City is skeptical of sonar leak detection, and based on the previous project, determines it to be less than cost effective.

8.0 WATER CONSERVATION IMPLEMENTATION PROGRAM

8.1 Implementation Plan

Based upon the analysis in section 7, it is realistic in the current economic climate to implement the following water conservation components. The programs discussed below are intended to be implemented within the planning period identified in this Plan.

Table 8.1 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

TOTAL	**30,997,785**		

The full Drought and Water Emergency Preparedness Plan is included in Appendix G, which is incorporated into this plan by this reference as if fully set forth herein.
Stage 1 recommended guidelines (listed below) will become part of a Water Consumer Initiative and will be implemented as part of water conservation measures U6, E1, E4, E6 and E7:

- 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 June15th 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.
- Encourage cutting lawn grass no shorter than 3 inches to reduce soil moisture loss and to promote deeper roots.
- Limit the filling of swimming pools to one per year, unless draining for repairs is necessary.

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	O&M
➢ 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	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	5,468,965	$61,738*	355 rebates over 1 year	Grant

necessitated				
➢ 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	O&M
TOTALS	**32,697,139**			

Result: 3% savings of total water produced

Add one program per year over the ten year planning period 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
- Leak Detection U1

System Loss Reduction Goals

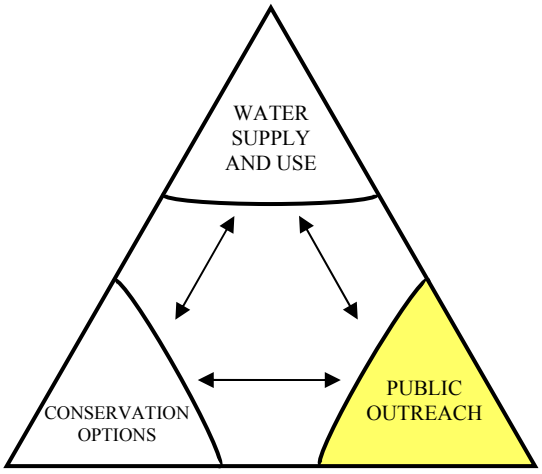
As outlined in Section 3, the estimated system loss for the City is 19.9% and MWW 12%. Losses that are due to distribution system leakage, metering inaccuracies, unmetered use and non-metered park irrigation would be addressed by implementing U1, U2, U4, U14, U11 and U19. Currently, approximately 156 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.

Amendment of U16 through Water Consumer Initiative

U16 Drought and Emergency Preparedness Plan in its entirety is located in Appendix G. Components of Stage 1, which are now identified as the Water Consumer Initiative, will be integrated into the implementation plan under measures U6, E1, E4, E6 and E7. Tables 7.4 and 7.5 that estimate water savings for each measure/program and total the results will remain as previously presented. A correction has been made in the implementation Table 8.1 to clarify water savings references and implementation intentions relative to U16.

The rate of adoption of the above measures and programs outlined in the implementation plan will depend on the economy and how we can access outside funds and resources.

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



9.1 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.

9.2 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.

9.3 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.

9.4 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.

10.0 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.

Future Rebate Program

Unique Water Conservation Fixtures:

This rebate program aims to address non-residential unique water conservation fixtures and emerging technologies (such as water recycling systems) that are not included in any of the other rebate programs. Specifically, the program offers a one-time rebate amount of three cents per gallon of water saved, up to a maximum of $1,500. However, the rebate only applies to the first years' calculated water savings volume for one installed fixture or device. In order to receive a rebate, the specific device shall be reviewed and approved by the respective Districts prior to installation.

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 elementary 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 fall, the MWW District hosts elementary 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 elementary 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 elementary school children 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, 80 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

Other Water Conservation Plans that were reviewed: Rifle, Colorado Springs, Erie, Fort Morgan, Fountain

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 m^3) 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.

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 mounts 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.

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

	Use		Use		Use	
Commercial	33	1,765	17	1,151	0	0
Residential	61	3,262	77	5,214	100	406
Combined	6	321	6	406	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 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 Units	EQR(equivalent residential unit)	EQR Totals	Total Gallons per day average	Percentage of Water Use
Commercial	2,916	1.1	230	670,292	23%
Residential	8,881	1	209	1,856,200	71%
Combined	727	1	209	151,960	6%
Total number of Units	12524			2,678,452	

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%.

NOTE: These projections utilized the best available data at the time. Actuals may vary.

Year	**Commercial**	**Residential**	**Combined**	**Total**
EQR	1.10	1.00	1.00	
	230	209	209	
2009	2,916	8,881	727	12,524
2010 (0.1% Total Growth Rate)	2,921	8,888	727	12,537
2011(0.4% Total Growth Rate)	2,933	8,924	730	12,587
2012(0.8% Total Growth Rate)	2,956	8,995	736	12,687
2013 (1.69% Total Growth Rate)	3,006	9,147	748	12,902
2014 (1.69% Total Growth Rate)	3,057	9,302	761	13,120
2015 (1.69% Total Growth Rate)	3,109	9,459	774	13,342
2016 (1.69% Total Growth Rate)	3,161	9,619	787	13,567

2017 (1.69% Total Growth Rate)	3,215	9,782	800	13,796
2018 (1.69% Total Growth Rate)	3,269	9,947	814	14,029
2019 (1.69% Total Growth Rate)	3,324	10,115	827	14,267
2020 (2% Total Growth Rate)	3,391	10,317	844	14,552
2021 (2% Total Growth Rate)	3,458	10,524	861	14,843
2022 (2% Total Growth Rate)	3,528	10,734	878	15,140
2023 (2% Total Growth Rate)	3,598	10,949	896	15,443
2024 (2% Total Growth Rate)	3,670	11,168	914	15,751
2025 (2% Total Growth Rate)	3,743	11,391	932	16,066
2026 (2% Total Growth Rate)	3,818	11,619	950	16,388
2027 (2% Total Growth Rate)	3,895	11,851	970	16,716
2028 (2% Total Growth Rate)	3,973	12,088	989	17,050
2029 (2% Total Growth Rate)	4,052	12,330	1,009	17,391
2030 (2% Total Growth Rate)	4,133	12,577	1,029	17,739
2031 (2% Total Growth Rate)	4,216	12,828	1,049	18,093
2032 (2% Total Growth Rate)	4,300	13,085	1,070	18,455
2033 (2% Total Growth Rate)	4,386	13,347	1,092	18,824
2034 (2% Total Growth Rate)	4,474	13,613	1,114	19,201
2035 (2% Total Growth Rate)	4,563	13,886	1,136	19,585

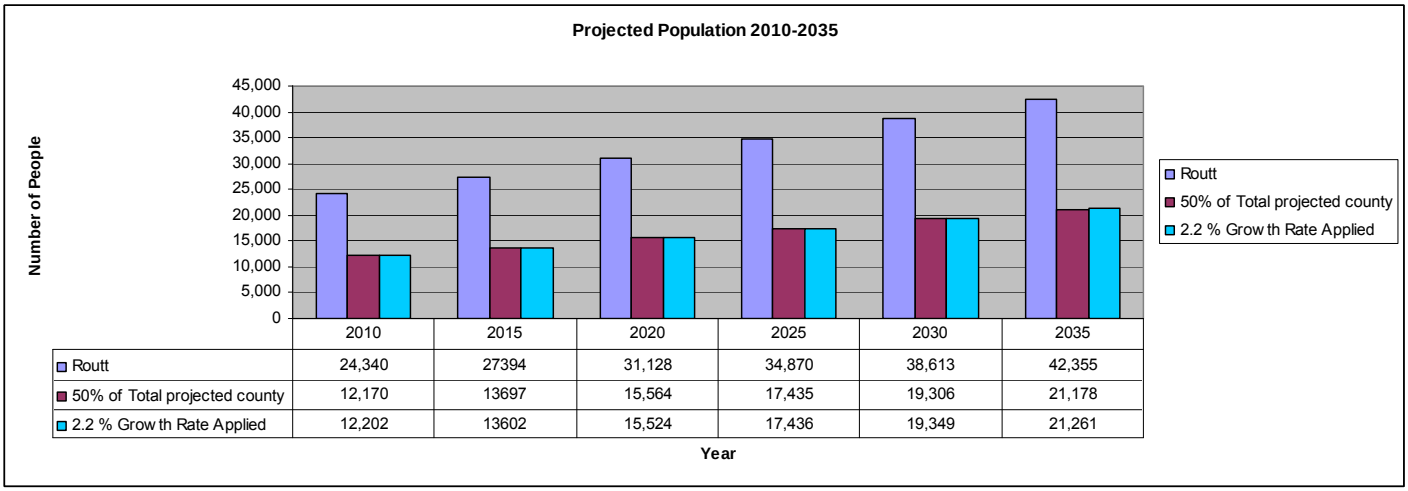
Table 4.5b.Projected Water Demand by Customer Class in Gallons for Both Districts

	Commercial	Residential	Combined	Total Demand per day (gallons)	Total Demand per year (gallons)	PRODUCED Demand based on 15% loss	Acre Feet
2009	670,388	1,856,129	151,943	2,678,460	977,638,046	1,124,283,753	3,450

2010	671,832	1,857,675	151,968	2,681,475	978,738,276	1,125,549,017	3,454
2011	674,520	1,865,105	152,576	2,692,201	982,653,229	1,130,051,213	3,468
2012	679,916	1,880,026	153,796	2,713,738	990,514,455	1,139,091,623	3,496
2013	691,406	1,911,799	156,395	2,759,600	1,007,254,149	1,158,342,271	3,555
2014	703,091	1,944,108	159,038	2,806,238	1,024,276,744	1,177,918,256	3,615
2015	714,973	1,976,963	161,726	2,853,663	1,041,587,021	1,197,825,074	3,676
2016	727,056	2,010,374	164,459	2,901,890	1,059,189,842	1,218,068,318	3,738
2017	739,344	2,044,349	167,239	2,950,932	1,077,090,150	1,238,653,672	3,801
2018	751,839	2,078,899	170,065	3,000,803	1,095,292,974	1,259,586,920	3,866
2019	764,545	2,114,032	172,939	3,051,516	1,113,803,425	1,280,873,938	3,931
2020	779,836	2,156,313	176,398	3,112,547	1,136,079,493	1,306,491,417	4,009
2021	795,432	2,199,439	179,926	3,174,797	1,158,801,083	1,332,621,246	4,090
2022	811,341	2,243,428	183,524	3,238,293	1,181,977,105	1,359,273,671	4,171
2023	827,568	2,288,297	187,195	3,303,059	1,205,616,647	1,386,459,144	4,255
2024	844,119	2,334,063	190,939	3,369,120	1,229,728,980	1,414,188,327	4,340
2025	861,001	2,380,744	194,758	3,436,503	1,254,323,559	1,442,472,093	4,427
2026	878,222	2,428,359	198,653	3,505,233	1,279,410,031	1,471,321,535	4,515
2027	895,786	2,476,926	202,626	3,575,338	1,304,998,231	1,500,747,966	4,606
2028	913,702	2,526,464	206,678	3,646,844	1,331,098,196	1,530,762,925	4,698
2029	931,976	2,576,994	210,812	3,719,781	1,357,720,160	1,561,378,184	4,792
2030	950,615	2,628,534	215,028	3,794,177	1,384,874,563	1,592,605,747	4,888
2031	969,628	2,681,104	219,329	3,870,060	1,412,572,054	1,624,457,862	4,985
2032	989,020	2,734,726	223,715	3,947,462	1,440,823,495	1,656,947,020	5,085
2033	1,008,800	2,789,421	228,190	4,026,411	1,469,639,965	1,690,085,960	5,187
2034	1,028,976	2,845,209	232,753	4,106,939	1,499,032,765	1,723,887,679	5,290
2035	1,049,556	2,902,113	237,408	4,189,078	1,529,013,420	1,758,365,433	5,396

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.



	2010	2015	2020	2025	2030	2035
Routt	24,340	27394	31,128	34,870	38,613	42,355
50% of Total projected county	12,170	13697	15,564	17,435	19,306	21,178
2.2 % Growth Rate Applied	12,202	13602	15,524	17,436	19,349	21,261

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
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	
	Average Demand per day (Gallons)		Difference
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
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**
						billed	337,900,000	461,000,000	798,900,000
1,886,000	4,300,000	462,070,000	516,000,000	978,070,000	827,733,181	**produced**	422,000,000	522,000,000	944,000,000
						losses	**19.93%**	**11.69%**	**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)	**4.171**	**4.436**	**4.379**	**4.201**	**4.297**	.=average Daily Use MGD			
(122 days)									
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)	**1.946**	**1.985**	**1.852**	**1.761**	**1.886**	.=average Daily Use MGD			
(243 days)									
243									

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

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	
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	Planning period is 10 years, so annual value is multiplied by 10.
Annual Amount of non-revenue water	42,094,500	33,028,809	gallons	50% of each systems non-revenue water City=19.95% MWW=11.69%
Annual Estimated Water Savings Rate	1.69%	1.75%	%	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.
Estimated Annual Water Savings	711,397	578,004	gallons/yr	1,289,401
Estimated Savings over Planning Period	7,113,971	5,780,042	gallons	Multiplied by 10
Labor Costs				
Staff Hours	40	40	per year	
Hourly Cost	$35.00	$35.00	per hour	Approximate, based on combined salaries averaged.
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	linear feet
Gallons Saved per Unit per year	135	109	gallons	
Annual Materials	$50,000.00	$50,000.00		Estimate
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		

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	**Notes**
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.	Amount each district produces
Estimated amount of water loss to infrastructure problems	42,052,300	30,510,900		Multiplied by 10
Annual Estimated Water Savings Rate	1.69%	1.75%	%	50% of each systems non-revenue water City=19.95% MWW=11.69%
Estimated Annual Water Savings	710,684	533,941	gallons/yr	Goal is to replace 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.
Estimated Savings over Planning Period	7,106,839	5,339,408	gallons	
Labor Costs				Multiplied by 10
Staff Hours	900		per year	
Hourly Cost	$40.00		per hour	Based on 2009 time sheets for water crew. Based on Utility engineers' salary, 20%of time. 100 hrs. of JZ time at 60 per hour.
Annual Staff Costs	$42,000.00	$214,000.00		Approximate, based on combined salaries averaged.
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		MWW: Includes staff and consultants costs.
Unit Cost	$50.57	$65.53	per participant	estimate
# of Participants	5,280	5,280	ft./per year	Per liner foot
Gallons Saved per Unit per year	135	101	gallons	Participant equals 1 mile
Annual Materials	$150,000.00	$104,000.00		
Rebates				Estimate-based on MWW
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		
sources:	BillingData(xls.)	MWW billing and payroll		

Measure/Program:	**U3. Tired Rate Structure**			
Description of Measure/Program	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.		**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	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)

Labor Costs				
Staff Hours	50	25	per year	Estimation from Billing Clerk
Hourly Cost	$23.00	$35.00	per hour	Based on utility billing clerk- pay scale #18 for City, Average of Director and Billing clerk cost for MWW
Annual Staff Costs	$1,150.00	$875.00		
Consultant Costs	$10,000.00	$9,350.00	per year	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
Unit Cost	$3.78	$3.48	per participant	Approximately 3000 customers
# of Participants	3000	3000	per year	
Gallons Saved per Unit per year	2110	2825	gallons	
Annual Materials	$200.00	$200.00		
Rebates				N/A
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	$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		
sources:	Water and Sewer rates (utility), billing data worksheet(LF)	Rates and billing data		

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	Amount of billed water
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%	%	Evans plan uses 1% water savings
Estimated Annual Water Savings	10,137,000	4,610,000	gallons/yr	
Estimated Savings over Planning Period	30,411,000	9,220,000	gallons	39,631,000
Labor Costs				
Staff Hours	100	20	per year	Limited number of hours
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	1/3 of all meters approx. 1000, MWW 574 per year
# 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		Only the first year will have initial costs. MWW: Cost of program to date
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		
sources:	City of Evans, Senus			

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 being 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	Planning period is 10 years, so annual value is multiplied by 10.
Annual Estimated Water Savings Rate	0.00%	0.00%	%	It is unlikely that there will be any measurable water savings for this program, because the water used can only be stopped when the valves and hydrant is fully flushed. By determining the amount of water used for each hydrant, on average, each district will have a better idea of the percentage of non-revenue water this program uses. Maybe in the future better techniques will create an opportunity for water savings.
Estimated Annual Water Savings	0	0	gallons/yr	
Estimated Savings over Planning Period	0	0	gallons	
Labor Costs				
Staff Hours	25	25	per year	Estimated time spent documenting flow rate and time of each flush. 25 extra minutes per flush for one employee to record data.
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	$0.00	$0.00		
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		
sources:	Water and Sewer rates (utility), billing data worksheet(LF)	Rates and billing data		

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		
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	assuming 25% of consumers implement water conservation over 10 years, first year 15%, 2nd year additional 5%, 3-10 yrs additional 5%
Remaining years	12,225,875		MWW, City & Stb II Metro 2009
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	prepare and mail
Annual Labor	$1,980		
Materials Costs	$100		
total	$2,080		develop educational information
Unit Cost			
# of Partipants	6000	all	3,000 taps each in City and MWW
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		
Estmated Total Cost over Planning Period	$20,800		
Cost per 1000 Gallons Saved	$0.14	$0.06	
sources:	Vickers		
LH 9.17.10			

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 sizefountain over Planning Period without Savings	7,545,600	gallons	There are two efforts already in place to address existing properties, a certification/education program administered by MWW, and the Steamboat Sustainable Business Program
Annual Estimated Water Savings Rate	100	%	
Estimated Annual Water	754,560	gallons/yr	
Estimated Savings over Planning Period	7,545,600	gallons	Depending on size and recirculating versus non-recirculating systems, as well as weather, small fountains use 50 to 525 gph (larger fountains 750-4,200gph). 252 gph x24 hrs x 120days/yr, June, July, August, Sept
Labor Costs			
Staff Hours	5	per year	assuming restrict one fountain per year
Hourly Cost	$50	per hour	
Annual Staff Costs	$250		
Consultant Costs			
Evaluation & Follow Up Cost			cost to implement ordinance
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	education materials
Rebates			
rebate cost residential	n/a		
Rebate Cost commerical			
# 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		
Estmated Total Cost over Planning Period	$3,500		
Cost per 1000 Gallons Saved	$0.46	$0.46	
sources:	Vickers		
LH 9.17.10			

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	
Years in Planning Period	5		
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	Amount in 5 years
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%	%	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.
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	Based on 5 audits per year. 20 hours per audit.
Hourly Cost	$26.75	per hour	Based on Water Technician salary pay scale #20
Annual Staff Costs	$2,675.00		
Consultant Costs	$0.00	per year	
Evaluation & Follow Up Cost	$400.00	per year	certification and continuing Education
Annual Labor	$3,075.00		
Materials Costs	$50.00		
Unit Cost	$615.00	/participant	
# of Participants	5	per year	
Gallons Saved per Unit per year	219,562	gallons	
Annual Materials	$50.00		
Rebates	N/A		
Rebate Cost			
# 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		
sources:	Irrigation Association		Job Order Sheets, Water repair list by location, time sheets, ParksWaterDemand(LF)

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.			
				Notes
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	Total billed water
Estimated Water Production over Planning Period without Savings	3,379,000,000	4,610,000,000	gallons	Planning period is 10 years, so annual value is multiplied by 10.
Annual Estimated Water Savings Rate	0.01%	0.01%	%	It is estimated that there is a 20% loss of number of gallons billed for a faulty meter. If each meter on average tracks 4,000 gallons a month and 20% of those gallons is not being billed for that equals 800 per month, per meter. For the year that equals 9,600 gallons a year. If 5 meters are replaced a year the annual savings is 48,000 gallons.
Estimated Annual Water Savings	48,000	48,000	gallons/yr	5 meters size 2 inch or greater replacement
Estimated Savings over Planning Period	480,000	480,000	gallons	
Labor Costs				
Staff Hours	15	43	per year	14 meters a year would require approximately 3 hours per meter
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		Average cost of $2300 per meter, times 14 meters
Unit Cost	$2,380.25	$2,601.00	per participant	Includes labor
# 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			

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	
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.
Annual Estimated Water Savings Rate	5.00%	5.00%	%	Value is estimated at 5% the first year and 0.5% the following years. In a drought year the percentage would dramatically increase.
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	Based on water technician salary pay scale #20 for City. MWW based on average of Director and Technician at 50 hours each.
Annual Staff Costs	$6,687.50	$3,500.00		
Consultant Costs	$0.00	$4,250.00	per year	Estimation based on 50 hours for MWW at $85 per/hr.
Evaluation & Follow Up Cost	$0.00	$0.00	per year	
Annual Labor	$6,687.50	$7,750.00		
Materials Costs	$500.00	$500.00		Paper materials, printing, distribution
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	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	$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		

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	
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	120 days at 4.3 mgd
Estimated Water Production over Planning Period without Savings			1,548,000,000	gallons	total for the 3 years
Annual Estimated Water Savings Rate (stage 1,2,3, respectively)	5.00%	10.00%	20.00%	%	Percentage is of summer irrigation water usage.
Estimated Annual Water Savings	25,800,000	51,600,000	103,200,000	gallons/yr	60,200,000
Estimated Savings over Planning Period	25,800,000	51,600,000	103,200,000	gallons	180,600,000
Labor Costs					
Staff Hours	50	100	150	per year	Increases based on enforcement time
Hourly Cost	$26.75	$26.75	$26.75	per hour	Based on water technician salary pay scale #20
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	$300.00	$500.00	$1,000.00		Paper materials, printing, distribution
Unit Cost	$0.44	$0.70	$1.00	/ participant	6000 total customers
# 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		Each year is a one time senerio.
One Time Materials Cost					
Labor Costs					
One Time Materials/Labor Costs					
Estimated Annual Cost	$2,637.50	$4,175.00	$6,012.50		$4,275.00
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		

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		
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	Ideas: track water conservation progress, have annual meetings, share info on rebates, etc., pool resources for media outreach, enforcement
summer water production	516,000,000	gallons	
Annual Estimated Water Savings Rate	0.10%	%	
annual water savings	978,070		MWW, City 2009
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	managers from all districts attend quarterly mtgs
Annual Labor	$2,250		
Materials Costs	$200		
total	$2,450		program dev, coordinate meetings, agendas, develop issue white papers, etc.
Unit Cost			
# of Partipants	6000	taps	roughly 3,000 each district
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		
Estmated Total Cost over Planning Period	$24,500		
Cost per 1000 Gallons Saved	$2.50	$2.50	
sources:			
LH 9.17.10			

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	assuming 25% of consumers implement water conservation over 10 years, first year 15%, 2nd year additional 5%, 3-10 yrs additional 5%
Estimated Savings over Planning Period	489,035	gallons	MWW, City 2009
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	prepare and mail
Annual Labor	$825		
Materials Costs	$100		
total	$925		develop educational information
Unit Cost		per tap	
# of Partipants	6000	taps	roughly 3000 taps each district
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		
Estmated Total Cost over Planning Period	$9,250		
Cost per 1000 Gallons Saved	$18.91	$18.91	
LH 9.17.10			

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	
Years in Planning Period	10		
Annual Water Production without Savings for program	30,000,000		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.
Estimated Water Production over Planning Period without Savings	300,000,000	gallons/yr	
Annual Estimated Water Savings Rate	10%	%	Based on approximately 1 park a year
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	Average costs for superintendent and technician. -Hours constituent some systems maintenance.
Annual Staff Costs	$1,750.00	per year	
Consultant Costs	$4,000.00	per year	Mater planning and preliminary design for 1 site
Evaluation & Follow Up Cost			
Annual Labor	$5,750.00		
Materials Costs	$45,000.00		construction costs
Unit Cost	$50,750.00	/participant	1 park a year
# of Participants	1	per year	
Gallons Saved per Unit per year	3,000,000	gallons	
Annual Materials	$45,000.00		Estimation: Dependant on size of park.
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		Cost to perform master planning and preliminary design and engineering for multiple locations.
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.		

Measure/Program:	**E1. Website Enhancements**			
Description of Measure/Program	-fact sheets, water calculator, water saving tips, evapotransporation info	Continue to add information and new tools as available.		
				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	0.005%	0.005%	%	Based on public interest which fluctuates and is hard to quantify. Estimating small impact, at .005% of total water produced.
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	3000 for City and MWW
# 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				SBII: Website design
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	

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		
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	2 % of irrigation water	%	18% per property targeted (summer months
Estimated Annual Water Savings	10,320,000	gallons/yr	
Estimated Savings over Planning Period	103,200,000	gallons	4.3 mgd for peak days (120/yr), June, July, August, Sept (MWW & City)
Labor Costs			
Staff Hours	5	per year	
Hourly Cost	$50	per hour	Metrics: 30 gpcd used for outdoor watering without conservation practices. 4 inches water /wk x 5,000 sq.ft = 12,280 gal/wk (Vickers)
Annual Staff Costs	$250		
Consultant Costs	$1,700	per year	
Evaluation & Follow Up Cost		per year	coordination
Annual Labor	$1,950		
Materials Costs	$1,000		
total	$2,950		annual training session in spring parnering with product manufactures, retailers, etc.
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		
Estmated 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			

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**
Planning Period	2011-2021		
Years in Planning Period	10		
Annual Water Production without Savings	516,000,000	gallons/yr	may be combined with R4. rebate program
Estimated Water Production over Planning Period without Savings	5,160,000,000	gallons	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.
Annual Estimated Water	18 % of irrigation water	%	
Estimated Annual Water Savings	468,844	gallons/yr	
Estimated Savings over Planning Period	4,688,440	gallons	4.3 mgd for peak days (120/yr), June, July, August, Sept (MWW & City)
Labor Costs			
Staff Hours	10	per year	
Hourly Cost	$50	per hour	Metrics: 30 gpcd used for outdoor watering without conservation practices. 4 inches water /wk x 5,000 sq.ft = 12,280 gal/wk (Vickers)
Annual Staff Costs	$500		
Consultant Costs	$4,250	per year	
Evaluation & Follow Up Cost			
Annual Labor	$4,750		
Materials Costs	$100		
total	$4,850		50hrs/yr for irrigation evaluations
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			$150 residential, $1,000 commercial
Labor Costs			10 each
OneTime Materials/Labor Costs			
Estimated Annual Cost	$16,350		
Estmated 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			

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		
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	MWW, City 2009
Estimated Savings over Planning Period	47,680,913	gallons	
Labor Costs			
Staff Hours	10	per year	assuming 25% of consumers implement water conservation over 10 years, first year 15%, 2nd year additional 5%, 3-10 yrs additional 5%
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		program development & assist implementation
Unit Cost		per tap	
# of Partipants	6000	all	
Gallons Saved per Unit per year	203.76	gallons	
Rebates			2,800 taps at City in 2010 , 3000 MWW taps
rebate cost residential	n/a		
Rebate Cost commerical			
# of Partipants		per year	
Annual Rebate Cost		per year	
One Time Labor & Material Costs	1000		
One Time Materials Cost			
Labor Costs			
OneTime Materials/Labor Costs			
Estimated Annual Cost	$2,300		
Estmated Total Cost over Planning Period	$24,000		
Cost per 1000 Gallons Saved	$0.50		
sources:	Vickers		
LH 9.17.10			

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	0.0500%	%	
Estimated Annual Water Savings 1st year	489,035	gallons/yr	MWW, City 2009
Estimated Savings over Planning Period	4,890,350	gallons	
Labor Costs			
Staff Hours	10	per year	assuming 25% of consumers implement water conservation over 10 years, first year 15%, 2nd year additional 5%, 3-10 yrs additional 5%
Hourly Cost	$50	per hour	
Annual Staff Costs	$500		
Consultant Costs	$850	per year	prepare and mail
Evaluation & Follow Up Cost		per year	
Annual Labor	$1,350		
Materials Costs	$500		develop educational information & plan events
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		
Estmated Total Cost over Planning Period	$18,500		
Cost per 1000 Gallons Saved	$3.78	$3.78	
sources:			
LH 9.17.10			

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 without Savings	328,500,000	gallons/yr	
Estimated Water Production over Planning Period without Savings	3,285,000,000	gallons	The Steamboat Sustainable Business Program has been working with businesses in the area for 4 years and has coached 79 businesses to date on all aspects of environmental sustainability including water conservation.
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	MWW, City & Stb II Metroestimated commercial class usage
Labor Costs			
Staff Hours	5	per year	10% over planning period
Hourly Cost	$50	per hour	1% 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		
Estmated Total Cost over Planning Period	$54,500		
Cost per 1000 Gallons Saved	$1.66	$1.66	
sources:	Vickers		
LH 9.17.10			

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	need grant money
Annual Estimated Water Savings Rate	0.05	%	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.
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	Metrics: 30 gpcd used for outdoor watering without conservation practices. 4 inches water /wk x 5,000 sq.ft = 12,280 gal/wk (Vickers)
Annual Staff Costs	$250		
Consultant Costs	$1,275	per year	
Evaluation & Follow Up Cost		per year	coordination
Annual Labor	$1,525		
Materials Costs	$500		
total	$2,025		annual training sessions
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		
Estmated Total Cost over Planning Period	$20,250		
Cost per 1000 Gallons Saved	$0.41	$0.41	
sources:	Vickers, Austin TX & Windsor WC Plans		
LH 9.17.10			

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 inthe MWW district. Rebates may also be incorporated.		**NOTES**
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	rebates would be dependant on obtaining grant money
Annual Estimated Water	10%	%	
Estimated Annual Water Savings	10,261,000	gallons/yr	10% of commercial class use
Estimated Savings over Planning Period	102,610,000	gallons	Sheraton used 10.2MGD/yr (2009), Sbt. Grand used 8.7 MGD/yr 2009
Labor Costs			assuming 10 properties per year at the size of sheraton
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		10 hrs/property
Unit Cost			
# of Partipants			
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	$8,850		
Estmated Total Cost over Planning Period	$88,500		
Cost per 1000 Gallons Saved	$0.86		
sources:	Vickers		
LH 9.17.10			

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		
Years in Planning Period	5	years	
Annual Water Production without Savings	978,070,000	gallons/year	Average Number of produced gallons
Estimated Water Production over Planning Period without Savings	4,890,350,000	gallons	Value multiplied by 5 years
Annual Estimated Water Savings Rate	0.03%	%	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
Estimated Annual Water Savings	822,071	gallons/yr	
Estimated Savings over Planning Period	4,110,356.25	gallons	
Labor Costs			10 toilets replacement inspections, plus planning and coordinating
Staff Hours	25	per year	
Hourly Cost	$26.75	per hour	Water Technician hours
Annual Staff Costs	$668.75		
Consultant Costs	$2,975.00	per year	consultant for 35 hours
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		Grant planning and program development, advertising. 50 hours at 50.00 for City Staff. 15
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		

Measure/Program:	**R1.b. Residential Toilet replacement Incentive**	
Description of Measure/Program	The goal of this program is too 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 the100 toilets for the year have been replaced.	
		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 years, 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	4275	Grant planning and program development, advertising. 50 hours at 50.00 for City Staff. 15 hours for consultant
One Time Materials Cost	500	
Labor Costs	3775	
One Time Materials/Labor Costs		
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	
sources:	Specification Supporting Statement	

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	
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%	%	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.
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	Water Technician time
Annual Staff Costs	$2,006.25		
Consultant Costs	$1,275.00	per year	15 hours
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		Grant planning and program development, advertising. 50 hours at 50.00 for City Staff, includes grant writer time. 15 hours at for consultant.
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		
sources:	EPA Energy Star, Water Sense		

Measure/Program:	**R3. Dishwasher Replacement Incentive**		
Description of Measure/Program	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.		
			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%	%	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.
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	Based on Water Technician Salary
Annual Staff Costs	$2,006.25		
Consultant Costs	$1,275.00	per year	consultant for 15 hours
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		Grant planning and program development, advertising. 50 hours at 50.00 for City Staff. 15 hours for consultant
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		
sources:	Energy Star, Penn State: Estimating Water Use and Savings in Your Home		

Measure/Program:	**R4a. Residential Irrigation Enhancement Incentives**		
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.		
			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	Admistrative 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			
	N/A		
One Time Materials Cost	500		Grant planning and program develpoment, advertising. 50 hours at 50.00 for City Staff. 15 hours for consultant
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:	Rainbird-water savings products		Cost of efficient spray heads=approx. 6 dollars per head. Rain sensors average cost 15-25.

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		
Years in Planning Period	5	years	
Annual Water Production without Savings	19,648,000		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.
Estimated Water Production over Planning Period without Savings	98,240,000		
Annual Estimated Water Savings Rate	18.00%	%	18% per property targeted (summer months only)
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	Administrative time
Hourly Cost	$26.75	per hour	Based on Water Technician salary
Annual Staff Costs	$401.25		
Consultant Costs	4250	per year	Consultant at 50 hours
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		Grant planning and program development, advertising. 50 hours at 50.00 for City Staff. 15 hours consultant
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			

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	
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%	%	Each district performs or responds to 75 incidents. If there is a residentital leak on average 200 gallons are wasted a day, asssuming the issue could be corrected after 1 month, the water savings equals 450,000 gallons in a year per district.
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				
Staff Hours	225	225	per year	Assuming each audit takes 3 hours
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				
Unit Cost	$401.25	$375.00	per participant	Per audit
# of Participants	75	75	per year	
Gallons Saved per Unit per year	6,000	6,000	gallons	
Annual Materials	0	0		
Rebates	N/A	N/A		
Rebate Cost				
# of Participants			per year	
Annual Rebate Cost			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	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			

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	
Years in Planning Period	10	10		
Annual Water Production without Savings	232,200,000	283,800,000	gallons/yr	516,000,000 is the total produced water at 4.3 mgd for the 120 irrigation season. The City comprises aprroximate;y 45% of the produced water with MWW at 55%.
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%	%	18% water reduction is estimated. Irrigation association.
Estimated Annual Water Savings	41,472	41,472	gallons/yr	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)
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	consultant
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	
# of Participants	20	20	per year	Number of audits
Gallons Saved per Unit per year	2,074	2073.6	gallons	
Annual Materials	0	0		
Rebates	N/A	N/A		
Rebate Cost				
# of Participants			per year	
Annual Rebate Cost			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	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		

APPENDIX G- DROUGHT and WATER EMERGENCY PREPAREDNESS

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.

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.

3. 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 June15th 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.
- Encourage cutting lawn grass no shorter than 3 inches to reduce soil moisture loss and to promote deeper roots.
- Limit the filling of swimming pools to one per year, unless draining for repairs is necessary.

3.1 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 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.

3.2 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.

APPENDIX H- 60 DAY PUBLIC COMMENT PERIOD-PRESS RELEASE, WEBSITES NOTICE AND PUBLIC COMMENTS AND RESPONSES

FOR IMMEDIATE RELEASE
STEAMBOAT SPRINGS Public Works
DECEMBER 22, 2010

Community Water Conservation Plan- 60 day Public Comment Period

During this year the City of Steamboat Springs and the Mount Werner Water and Sanitation District worked together to further develop the Community Water Conservation Plan (WCP) to meet Colorado Water Conservation Board (CWCB) approval.

The draft Plan is now available for review and public comment starting December 23, 2010 until February 23, 2011. During the public comment period we will make two informational presentations on January 18, 2011 at the City of Steamboat Springs City Council meeting and January 20, 2010 at the Mount Werner Water board meeting. The public is welcome to attend these meetings and comment on the Plan; in addition, written input and suggestions are encouraged.

Once this Plan is approved by the CWCB, our districts are eligible for State grants to fund the implementation of new water saving programs and measures. Public outreach and awareness programs are already in place promoting the benefits of water conservation to our community, and providing guidelines for conserving water at home and at work. However, there are many more initiatives utilities and water users can implement, for example, retrofitting outdated appliances, improving irrigation equipment, offering customer rebates, and deploying leak detection technology. The main focus of water conservation is to conserve a precious, limited resource; however, the water saving programs also aim to reduce peak-day water demand in order to defer expensive capital costs associated with water and wastewater infrastructure expansions.

To review an electronic copy, please visit our websites at:

http://steamboatsprings.net/departments/public_works/utilities/water_conservation_information or http://www.mwwater.com/conservation.html or stop by Mount Werner Water District offices or City Hall for a hard copy of the Plan.

Also, please send written comments to:
City of Steamboat Springs' contact: Laura Frolich (970) 871-7073 or lfrolich@steamboatsprings.net
Mt Werner Water District contact: Jay Gallagher (970) 879-2424 or jgallagher@mwwater.com

Community Water Conservation Plan
Public Comments and Responses
City of Steamboat Springs

Comment: Elizabeth Finch, Lowell Whiteman School

Dear City of Steamboat Springs and Mount Werner Water:

I would like to comment on the recently developed water conservation plan. First of all, it is commendable that the City and MWW have developed this plan, even though neither fall under the regulations of the Colorado Water Conservation Act. Employment of the plan and the eventual water savings will be beneficial for the town and surrounding environment. After reviewing the conservation measures that are currently being used and those suggested, I feel it would be important for the City and MWW to also focus on the importance of public awareness and education. Xeriscaping, although currently demonstrated at the Botanical Gardens, could also be practiced in areas that receive more foot traffic. Any available spaces near the heart of downtown Steamboat Springs would be more seen by more citizens, and would therefore be more effective in demonstrating xeriscaping to the public. Newsletters, door hangers, and displays are effective methods of influencing the people to conserve; However, methods that are more interactive can have a larger impact. Getting townspeople and students involved in conservation projects could leave a long-lasting impression on them. For example, elementary students could help build a native plant garden at their school or do research projects on water use for science class. Reaching and educating the public is important because excessive water waste within homes and offices is somewhat like having a massive leak in a main pipe.

Thank you for reading and considering my opinions,
Elizabeth H. Finch

Response

Dear Ms. Finch,

Thank you so much for taking the time to review our plan and provide comments. You mention the importance of focusing on public awareness and education and we agree completely.

In the plan, the second largest category for programs and measures is Education. This includes nine different types of programs and demonstrates our commitment to Education. Your suggestions for the elementary students are fantastic and will be incorporated when we develop the specifics of the Youth program, E5. We also appreciate your recognition of the importance of xeriscaping; outdoor water use, particularly lawn and shrub irrigation, is a major contributor to increasing peak day demand. Your suggestion to expand display gardens to more high traffic locations could fit into the Education program under E11 “Seminars and demonstrations targeted to professionals and business” or under E6 "General Public Education programs and Annual event". We could hold a planting day and possibly dedicate part of another city-owned property to a xeriscape garden. Also, we would like to create a map to show all the xeriscape display gardens in the city to highlight the fact there are existing gardens such as at the Routt County Human Services building. Interaction is a key component to education and we look forward to implementing “hands on” programs as we move forward. For all the programs, the specifics will be

developed prior to implementation and, therefore, are not detailed in this document. We also look forward to developing partnerships with schools and teachers and are excited for the possibilities this plan holds.

Sincerely, Laura Frolich

Comment: Nikki Durkan, Lowell Whiteman School

I have a few comments and questions about the proposed water conservation plan:

- The document states that the golf courses, ski resort, and some city facilities use gray water for irrigation but what are the exact percentages for each use?
- Along with the recommendations in the document for educating the public, I believe city xeriscape projects should be expanded. Areas with high traffic such as city parks and the tubing entry and exit points would be ideal locations.
- Green marketing should be encouraged. While Haymaker golf course outlines sustainable practices on the website, I could not find any mention on the Steamboat Golf Club website. HOA's and property managers should also be educated on the value of marketing sustainable practices.
- Please support the use of rebates and community events such as the expo described in the document. Raffles might be a good way to encourage the public to attend!

Thank you for your consideration,

--
Nikki Durkan
Science Teacher
Horse Program Director
Librarian
The Lowell Whiteman School

Response

Dear Ms. Durkan,

Thank you so much for taking the time to read our plan and provide feedback and questions. I have detailed my response below to coordinate with your original bullet points.

- ***Section 6.4 Water reuse systems, potable and non-potable*** should probably have a clarification about gray water. The water that is reused is either treated wastewater or recycled water which goes through a filtration process. Gray water is considered a health risk and is not permitted at this time by the State of Colorado. The only facility that irrigates with treated wastewater is the wastewater treatment plant. Facilities like Haymaker Golf Course and the transit center have recycled water systems that are used for washing equipment and are closed systems, collecting and utilizing almost 100 percent of the water. Those systems do require being refilled with fresh water every couple months. Rollingstone Ranch (fka Sheraton) golf course use only raw water diverted directly from Fish Creek; they have a potable water backup if the pumps fail, but haven't used this for 4-5 years.

- We also appreciate your recognition of the importance of xeriscaping; outdoor water use, particularly lawn and shrub irrigation, is a major contributor to increasing peak day demand. The suggestion to expand display gardens to more high traffic locations could fit into the Education program, under E11 "Seminars and demonstrations targeted to professionals and business" or under E6 "General Public Education programs and Annual event". We could hold a planting day and possibly dedicate part of another city-owned property to a xeriscape garden. Also, we would like to create a map to show all the xeriscape display gardens in the city to highlight the fact there are existing gardens such as at the Routt County Human Services building.

- Green Marketing is an important aspect to consumers and should be recognized when possible. We do have a program for HOAs that certifies them as being Sustainable in Gold, Silver and Bronze categories and we encourage them to advertise this fact. In our training and education programs we can remember to discuss the power of marketing and how companies should bring attention to conservation practices employed. The Steamboat Golf Course is privately owned and only uses water from their own water rights, therefore they are not apart of our customer base.

- Rebates are one of our top priorities and it is included in our 2011 Implementation plan. For this year the full proposed program list is dependent on receiving State grants, as our budgets are not able to do the full scope without assistance. However, we are hopeful to issue rebates this year and have a large public event. Raffles are a good idea!

For all the programs, the specifics will be developed prior to implementation and, therefore, are not detailed in this document. We look forward to developing partnerships with schools and teachers like you and are excited for the possibilities this plan holds.

Sincerely, Laura Frolich

Comment- Kate Nowak, Yampa Valley Partners

I reviewed the City of Steamboat Springs water conservation plan and I think it looks *great*. I see a lot of work has gone into this plan - congratulations. Here are my comments:

- Glad to see such aggressive plan to update infrastructure – since a considerable amount of water loss is happening there.
- Like the concept of the Community Water Suppliers Group and would suggest inviting some "green" nonprofits to participate when appropriate. They can easily be a green education arm of this committee. YVSC and Yampa Valley Partners comes to mind!
- When looking at incentives and rebates for consumers, please utilize the rechargecolorado.com web site.
- Agriculture: approach with caution and collaborate with the Yampa White Roundtable – they seem to have a good representation of all water interest on their roundtable. They do some education through the Community Agriculture Alliance.
- I can easily see some of your water conservation training and the YVSC "Talking Green" program collaborating
- YVSC has a youth/school committee made up of "sustainable representatives" from each district and a handful of volunteers that promote and educate on green initiatives. Perhaps coordinating with them on some of your school water education might be successful.
- If you send the "green" organizations your water newsletters we can circulate through our newsletters and social media.
- I am recommending that a public/private partnership develop to help you reach your education goals. The YVSC has coordinated a group of all green entities in Routt to coordinate activities. This helps with all resources; people, money and time.
- It looks to me that you have covered all the bases – a thorough job. Congratulations once again!

PS I have been involved with YVSC on their "Every day is earth day" week 5/14-5/21. Perhaps this would be a time to offer a training? Utilize shared marketing for your event.

Response

Dear Kate,

Thank you so much for taking the time to review our Plan and provide comments. We really appreciate your thoughtful feedback. As we move forward with program development and implementation we will invite partnerships from organizations like Yampa Valley Sustainability Council and Yampa Valley Partners. Also the suggestions about the types of areas YVSC and YVP have expertise in, specifically outreach and education, is important for us to remember and will be explored in the future. Our community is fortunate to have a diverse group of green organizations and our water districts plan to foster long standing relationships with them as we enhance these initiatives. Thank you for the heads up on Earth Week; it seems like a great opportunity that we will look into. Also, once we have established the Rebate program I would like to talk to you about rechargecolorado.com and if there is an opportunity to advertise our rebates on this website, however only Mount Werner Water and City of Steamboat Springs water customers will be eligible.

The scope of our community plan focuses on conserving treated water provided by municipal water districts. Therefore, water activity within Routt County from private water right holders, agricultural and small municipal suppliers will not be incorporated into our efforts at this point. Our reach of influence lies within our distribution systems and the customers it serves, which are within Steamboat Springs city limits, except for Steamboat II Metropolitan District. However, we recognize the importance of the agricultural community and their role in water conservation but feel that there are sufficient resources like the Roundtable and the Agriculture Alliance to guide them towards water conservation initiatives.

Once again, thank you for your comments and we looking forward to developing partnerships with organizations, like the one you represent. We are exited for the potential opportunity this plan holds.

Sincerely, Laura Frolich

Comment: John Fielding

John Fielding believes that it is a great idea to conserve, however his water bill in the summer is $200; the basic water rate is twice what he pays in Utah. He encouraged Council to look at penalty rate when a user uses over a certain amount.

Fielding stated that the penalty rate applies only to residential and does not distinguish when a person is wasting water or just has a large need. He asked Council to reexamine this.

Response: Philo Shelton

The commercial class is charged a flat rate per 1000 gallons, which is much higher than most of the tiered rates in the residential class, therefore they are incentivized financially to use water conservatively. The Utility division hired consultants to devise a master water and wastewater Rate study, where different rate structure alternative were provided. The one which is in affect was approved by City Council.

Comment Jay Gallagher

Gallagher stated that he enjoyed working with the City on this; the Plan is in final form thanks to Frolich and Halliday. We now have a way to prepare the community for drought.

Response: NONE

Comment/Question: Ceri Hermanciski, City Council President

Question 1: Ms. Hermancinski asked about the population predictions and what the growth rates were based on.

Response

On page 1-61 an 1-62 of the 1.18.11 Epacket, the methodology used to project water demand by customer class per equivalent residential unit (EQR) is explained. Below is the annual growth rates used and the EQR multiplier used is 209 gallons per EQR per day. Gallons per capital per day (GPCD) are mentioned but not used because it can inaccurately reflect tourism usage and fluctuating populations.

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%
- 2020-2035-- 2% (consistent with DOLA and past average projections)

Comment/ Question: Bart Kounovsky, City Council Official

Mr. Kounovsky mentioned about bill stuffers saying they appear to be "a low hanging fruit'. He expressed uncertainty in the large number of gallons estimated to be saved from this measure.

Response:

Yes it is and we definitely hope to do those this year, as well as other programs that are inexpensive and reach a broad audience. Most of our education programs are that way.

Comment/Question: Kenny Reisman, City Council Official

Reisman asked about the online billing and still being able to do bill stuffers.

Response:

Yes, we can do online billing and have inserted bill stuffers as well. We have not switched to paperless billing and therefore at this point we will continue sending out statements in the mail. In the future we can find creative ways to message our customers.

Comment: Mr. Randall (MWW Board)

Mr. Randall commented that he as a gardener is interested in drought-resistant plants and shrubs; that he would encourage nurseries to set out and mark drought-resistant plants. Ms. Halliday agreed and commented that the Botanic Park has a drought-resistant garden display and held an outdoor seminar last summer to provide information on local climate, drought-resistant plants and shrubs, and advances in irrigation system technology. Mr. Gallagher stated that the City and the District had posted a list of drought-tolerant plants and shrubs on their websites. Mr. Randall encouraged City and the District to involve community groups who will endorse this plan and help in its implementation.

Comment: Mr. Fraiser (MWW Board)

Mr. Frasier asked about the methodology of projecting future usage and the source of population figures. Ms. Halliday responded that the team had developed City water use projections using population growth data provided by the Colorado Department of Local Affairs and per capita water usage figures developed from recent water use studies by City consultants. With a transitory population, projected water use in the District is developed through District analysis of EQR's (equivalent residences) to build-out.

Comment: Ms. Connell (MWW Board)

Ms. Connell stated that it was very important to educate and encourage the Homeowner Associations in the District to adopt conservation-minded landscape management and irrigation techniques. Mr. Frasier agreed; he added that Mountain Resorts was promoting the District's water conservation certification program to the HOA's. While there was some resistance from the HOA boards, a dialogue had been established. That is an important first step.

ONLINE Comments: NO Responses were provided.

January 25, 2011 at 12:58 p.m. pilot on-line

Solo (anonymous) says... Last year we could give away 900 acre feet of water, now we need to conserve?

January 25, 2011 at 2:21 p.m Pilot on-line

weststmbtres (anonymous) says... Fix the leaks. Steamboat II has ditches with water running year round. It doesn't matter how cold or how dry it's been. The folks at the corner of Steamboat Drive and Harbor Place could irrigate their lawns all summer with the amount of water in that ditch. In the winter we are on our own well system but in the summer it Steamboat water that's flowing in our pipes.

CITY OF STEAMBOAT SPRINGS, COLORADO

RESOLUTION NO. 2011-14

A RESOLUTION TO ADOPT THE COMMUNITY WATER CONSERVATION PLAN, DEVELOPED WITH ASSISTANCE FROM THE COLORADO WATER CONSERVATION BOARD.

WHEREAS, the City of Steamboat Springs Utility Division and the Mount Werner Water and Sanitation District worked in partnership to create a plan that identifies water conservation programs and measures which should reduce treated water consumption by 15% by the year 2035; and

WHEREAS, the plan identifies an implementation plan to achieve the water savings targets; and

WHEREAS, the plan contains a Drought and Emergency Preparedness Plan that will ensure our community is prepared to respond to potential water supply shortages; and

WHEREAS, the plan establishes goals to improve system distribution efficiency, reduce peak day demand by focusing on outdoor water usage, and, thereby, defer capital expenditures for additional treatment capacity; and

WHEREAS, the public education and outreach programs have potential to create a conservation culture in our community to protect and conserve water resources in the City of Steamboat Springs.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF STEAMBOAT SPRINGS, COLORADO, THAT:

Section 1. The Community Water Conservation Plan (attached hereto as Exhibit A), developed in 2011 is a guiding document that will assist the community in conserving a finite natural resource, prepare us for drought and emergency and defer the capital investment required to expand water treatment capacity, and is hereby adopted.

PASSED, ADOPTED AND APPROVED this 7th day of June, 2011.

Cari Hermacinski, President
Steamboat Springs City Council

ATTEST:

Julie Franklin, CMC
City Clerk

SEAL OF THE CITY OF STEAMBOAT SPRINGS
INCORPORATED 1900
COLORADO