EAGLE RIVER
WATER & SANITATION DISTRICT

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June 29, 2012

Veva Deheza, Manager
Kevin Reidy, Technical Specialist
Office of Water Conservation and Drought Planning
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, Co 80203

SUBJECT: EAGLE RIVER WATER & SANITATION DISTRICT
WATER CONSERVATION PLAN COMPLETION

Dear Ms. Deheza and Mr. Reidy,

The Eagle River Water & Sanitation District has completed a Water Conservation Plan per Colorado's Water Conservation Act of 2004 with the contracted help of AMEC Earth & Environmental, Inc. and Leonard Rice Engineers, Inc.

On June 28, 2012, the District Board of Directors approved the submission of the final draft Water Conservation Plan to the Colorado Water Conservation Board for its consideration.

The District Board supports this plan and is prepared to direct staff to implement it should the CWCB accept and approve the plan.

Thank you for the guidance and funding provided by the CWCB to develop and complete this plan.

Sincerely,

Linn Brooks
General Manager

Enclosed: District Water Conservation Plan

EAGLE RIVER WATER & SANITATION DISTRICT
2009 – 2015 WATER CONSERVATION PLAN

Adopted on June 28, 2012

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ACRONYMS/DEFINITIONS

Accommodation Unit	One habitable room intended primarily for sleeping purposes and without a cooking facility (e.g., hotel room)
the Act	Colorado Water Conservation Act of 2004
Acre-foot (AF)	The amount of water it takes to cover one acre one foot deep; it equals 325,851 gallons and is the approximate amount of water needed to supply one to four households per year, depending on lawn size and irrigation requirements.
Authorized Unbilled	Water use that is estimated and includes un-metered water use incurred through events such as fire department use, main line flushing, tank overflow, or system leaks. Authorized Unbilled water also includes Dowd Junction interconnect transfers of water between Vail and the UERWA
AWWA	American Water Works Association
BMP	Best Management Practices
cfs	Cubic feet per second
CWCB	Colorado Water Conservation Board
Commercial Account	Customer account type that includes those delivering water to any structure or facility that is used to engage in a business, commerce, manufacturing, marketing, and/or sale of products and services of any kind, and that is not habitable
Dowds Junction	Location of the system interconnect between the Eagle River Water & Sanitation District and the Upper Eagle Regional Water Authority near the confluence of Gore Creek and the Eagle River north of Minturn, CO; see Figure 2-2 for map
Efficiency Unit	Residential Unit having one room with an integral cooking facility and one bathroom
EPA	Environmental Protection Agency
Evapotranspiration (ET)	The combined process of evaporation from the soil and water transpiration through plant surfaces. It is measured as a rate, i.e., inches per day (or week, month, or year) and changes with the weather. The hotter and drier the weather, the greater the ET and thus the greater amount of water the plants require.
Front Range	Geographic area of Colorado located east of the foothills of the Rocky Mountains; the most populous region of the state
gpcd	gallons per capita per day
gpf	Gallons per flush
gpm	Gallons per minute
Guidance Document	CWCB Water Conservation Plan Guidance Document
HDPE	High density polyethylene
HOA	Homeowners Association
Hydrant Account	Customer account type that represents usage from meters that are able to be rented seasonally (April 15 – October 15) and are placed on a fire hydrant in order to record water usage. The water is not to be used for landscaping or establishing seedlings, but rather used to control dust at construction sites or for other construction needs when main line connection at the construction site has not been made

ICI	Industrial, Commercial, and Institutional
Irrigation Account	Separately metered outdoor use accounts with no associated structure(s) or tap fees, e.g., most parks
MG	Million gallons
MGD	Million gallons per day
Mixed Use Account	Customer account type that includes facilities containing one or more Residential units and one or more Commercial units within the same structure, e.g., a hotel account with a restaurant, and/or retail space in the hotel structure
N/A	not applicable
Non-Revenue Water	Estimated as the difference between production numbers and metered and estimated water use. In Vail, Non-Revenue Water historically accounts for a large percentage (approximately 23.8% for the 2000 through 2007 period) of total water produced.
NRWC	Non-Revenue Water Committee
NWCCOG	Northwest Colorado Council of Governments
Plan	Eagle River Water & Sanitation District Water Conservation Plan
Residential Account	Customer account type that includes both single and multi-unit residential housing, e.g., single family homes, condominiums, townhouses, duplexes, multiplexes, apartments, efficiencies (hotel rooms), studio units, or mobile homes
SFE	Single Family Equivalent
SGM	Schmueser Gordon Meyer, Engineering and Surveying
SIC	Sprinkler Irrigation Coverage
SIR	Sprinkler Irrigation Ratio
Sprinkler Account	Separately metered outdoor use accounts associated with a structure(s) for which tap fees have been paid. Examples include a common area irrigation system serving a condominium association, individual home, or business landscaping
TOV	Town of Vail
UERWA	Upper Eagle Regional Water Authority
WCCAC	Water Conservation Community Advisory Committee
WWTP	wastewater treatment plant

EXECUTIVE SUMMARY

Water conservation is playing an increasingly important role in water supply planning for the citizens of Colorado and throughout the West in response to recent drought cycles and the realization that water is truly a finite resource. While water conservation practices ultimately depend upon the water user or customer, water providers can also make a large impact through their daily operations, future planning efforts, and acting as proponents for water conservation within the community through education and water conservation program development. The Eagle River Water and Sanitation District (District) has been the leading proponent for water conservation program development and implementation in the Vail Valley for the last 20 years. This Water Conservation Plan (Plan) builds upon this conservation history with refinements to existing programs and new opportunities the District can implement and integrate into its water supply planning.

This document presents the District's Plan, which was developed in accordance with the Colorado Water Conservation Act of 2004 (HB 04-1365). The District is a "covered entity," that provides at least 2,000 acre-feet (AF) of retail water to its customers on an annual basis and is therefore required to have an approved Plan on file with the State's Office of Water Conservation and Drought Planning. Furthermore, in order to receive loan and grant proceeds from the Colorado Water Conservation Board (CWCB) or the Colorado Water Resources and Power Development Authority, each covered entity must prepare and submit a Plan. In addition to the ability of water providers to demonstrate efficient utilization of water resources, water conservation is becoming an increasingly important consideration in the context of federal, state, and local permitting processes for water supply and distribution facilities.

The CWCB recommends Nine Planning Steps to assist in adhering to requirements of the Water Conservation Act of 2004. These steps are followed in this document and include:

- Profiling the existing system
- Characterizing water use and forecasting demand
- Profiling proposed facilities
- Identifying conservation goals
- Identifying conservation measures and programs
- Evaluating and selecting conservation measures and programs
- Integrating resources and modifying forecasts
- Developing an implementation plan
- Monitoring, evaluating, and revising conservation activities and the conservation plan

The District's Customers and Service Area

The District provides potable water and wastewater services for the Town of Vail and mixed use developments near Wolcott, which is approximately 20 miles west of Vail. Vail is a resort community and therefore the majority of housing units are multi-unit condominiums or townhomes and hotel rooms. Many are second homes that are unoccupied a large percentage of the time. The full-time population of Vail is approximately 4,800 residents, but the District's water service area population during high occupancy periods can reach up to 25,000 people (see p. 35). In addition to full time residents and overnight guests, up to 10,000 day skiers visit the Vail Ski Area from areas outside the District's Vail service area, resulting in a total population served of up to 35,000. Water usage therefore varies seasonally depending upon dwelling unit occupancy rates, outdoor water uses, and day-skiers. Although the residents are not present at all times, second home water accounts still use water for landscape maintenance and other ongoing purposes. Accurate daily population numbers are especially challenging to determine because people frequently come into Vail just for the day to dine, shop, work,0 or for recreational pursuits such as skiing, hiking, biking, fishing, and golfing. As such, the District is presented with a unique situation in its need to respond to demands for highly variable population numbers on a day-to-day basis.

Water Use and Supply Sources

The District's average annual water use from 2000 to 2007 was approximately 2,941 AF, which is primarily supplied from five wells in the Gore Creek alluvium. Residential, Commercial and Mixed-Use uses comprise about 70% of this demand, while the remainder is due to Sprinkler, Irrigation, Authorized Unbilled, and Non-Revenue Water uses. Trends in water demands from 2003 through 2006 were affected by redevelopment and updating of commercial establishments resulting in a decrease in demand during construction followed by an increase when these customers came back on-line. It is expected that annual total water use will continue to increase as planned redevelopment and improvement projects are completed. With the trend toward higher density development and redevelopment, the number of units and Single-Family Equivalents (SFEs) served by the District will continue to increase.

The District has a portfolio of water rights that have been secured and integrated into plans for augmentation by the Water Court to ensure a year-round, reliable water supply for present and future needs. The District has surface water and groundwater rights, including direct flow and storage rights. Due to its reliable, year-round alluvial groundwater supply, the District operates its water supply system differently when compared to many municipalities on the Front Range. For example, the District does not normally rely on its reservoirs as a direct source of water for its customers as many Front Range communities do for a significant portion of their supply. Rather, the District's reservoirs are used primarily for augmentation of out-of-priority depletions that occur primarily in the late summer and winter months. In addition, the District uses reservoir storage to maintain and enhance streamflows during low stream flow conditions.

Though the size of District's service area in Vail is not likely to grow significantly, redevelopment efforts will continue to increase population density and the number of commercial establishments. Exact data regarding future development and redevelopment plans are changing and evolving in response to local and national economic conditions, which creates uncertainty and difficulty in forecasting demands. The Wolcott area is currently predominantly agricultural land, but it is anticipated that rapid commercial and residential development will occur there within the next decade. The District is currently acquiring and developing additional augmentation sources that will assure permanent sources of supply to satisfy current and future demands

Public Involvement in Plan Development

Because the implementation of effective water conservation programs depends upon the support and cooperation of its customers, the District involved various community groups throughout the planning process. The Board of Directors, staff, consultants, a Water Conservation Community Advisory Committee (WCCAC), and the general public were engaged during the Plan development. The WCCAC was comprised of nearly 30 volunteer members representing a wide-variety of interests within the District's service area such as educational, hotels and restaurants, landscaping and irrigation, new construction and development, and residential areas, Homeowners Associations (HOAs), and others. Forums such as public meetings, a WaterWise Wednesday meeting (see p. 17), and internal workshops were used to solicit feedback, suggestions, and concerns regarding the water conservation plan.

Conservation Goals

The District's overall programmatic water conservation goal is to minimize waste and encourage efficient use of water resources. All water used in the District's service area originates from Gore Creek or the Eagle River, therefore water use in Vail is linked directly to biological and recreational resources that are important to the area's recreational and tourism-based economy. The fundamental resource conservation principles underlying the District's water management and conservation goals are driven by the need to protect streamflows and water quality in Gore Creek and the Eagle River. High water demands during late summer, fall and winter in the District's service area coincide with periods when stream flows are at their lowest. Efficient utilization of water through implementation of the programs and measures identified in this Plan is an important component of the District's goal of maintaining and enhancing streamflows. In addition, the District recognizes the economic benefits of conservation associated with reduced

costs of pumping, water and wastewater treatment, and other operational efficiencies which make conservation a good business practice.

Conservation will also be an element of the District's strategy for responding to demand side uncertainties associated with changing land use patterns (e.g., development density) and supply side uncertainty resulting from factors such as climate change. The District's programmatic water conservation goals are listed below.

1. Continue to identify and reduce Non-Revenue Water.
2. Continue trend of reduced consumption rate per SFE.
3. Reduce water demand by 12% by from 2009 levels by 2015.
4. Increase emphasis on conservation efforts in the hotel/commercial water use sectors.
5. Increase community education and regulation to encourage irrigation efficiency.
6. Develop and implement a monitoring and accounting system that allows for effective measurement of water savings associated with conservation measures and programs.
7. Continue existing water conservation activities which have proven effective and that have been accepted by the community.
8. Select and implement new conservation measures and programs based upon their water savings potential, cost-effectiveness, and consistency with community values.

Based upon the evaluation of individual conservation measures described in Section 7, it is estimated that the Plan will result in a total annual savings of nearly 420 AF by 2015 and a cumulative savings of 2475 AF over the 7-year term of the Plan. This water will be needed by the District to meet future water demands. The programmatic goals listed above may evolve over time as new and improved ways to conserve water are identified.

Selection of Conservation Measures and Programs

An assortment of water conservation measures and programs were evaluated during the Plan development process that ranged from educational programs for residents, visitors, and commercial entities to distribution system leak detection and repair. After thorough evaluation of water savings and program costs and input from the WCACC, District Board, staff, consultants, and community, a final set of measures and programs selected for implementation was developed. Table ES-1 presents these measures and programs, which align with the District's programmatic water conservation goal of minimizing waste and encouraging efficient utilization of water resources.

Table ES-1: Selected Conservation Measures and Programs, Implementation Dates and Estimated Annual Savings

Water Conservation Measures and Programs	Status and Implementation Dates	Estimated Annual Water Savings as of 2015 (AF)
Water Efficient Fixtures/Appliances and Incentives		
Free Indoor Water Conservation Kits	Existing (1994)	41.8
New and Retrofit Fixture Incentives: Commercial	Existing (2008)	7.3
Indoor Retrofitting at District Facilities	Existing (1997)	0.8
Toilet rebates – ultra-low flush and/or dual flush: Residential	New (2010)	3.4
Tap Fee Incentives for New Development	New (2013)	Unknown
Landscape Efficiency		
District Waterwise Landscaping and Demonstration Gardens	Existing (2005)	Unknown
Landscape and Irrigation Audits: Residential/Commercial/HOA	New (2011)	4.4
Certification Program/Classes for Landscape/Irrigation Professionals	Existing (1994)	Unknown
Free Outdoor Water Conservation Kits	New (2009)	Unknown

Water Conservation Measures and Programs	Status and Implementation Dates	Estimated Annual Water Savings as of 2015 (AF)
Rain Sensor Incentive	New (2010)	Unknown
Evaluation of Landscape and Irrigation Plans for New/Re-development	New (2012)	Unknown
Industrial and Commercial Efficiency		
Tourist Industry	Existing (2004)	2.8
Lodging Sector Voluntary Conservation Programs	Existing (2004)	3.5
Commercial and Industrial Water Conservation Education and Support	Existing (2003)	Unknown
Low-Flow Commercial Pre-Rinse Spray Washers	New (2009)	62.2
Education/Information Distribution		
Public Education	Existing (1994)	Unknown
Youth and Teacher Education	Existing (1991)	10.9
Indoor Water Audits	Existing (2008)	Unknown
Water Conservation Webpage	Existing (2003)	Unknown
Encouraging Water Conservation Through Water Rate Structures and Billing		
Water Rate Structure	Existing (2003)	Unknown
2008 Billing System Upgrade	Existing (2008)	Unknown
Uniformity Project	New (2009)	Unknown
Regulations/Ordinances		
District Water Use Regulations	Existing (1995)	Unknown
Collaborate with Land Use/Governmental Agencies	Existing (2003)	Unknown
Other Water Management Activities		
Water Conservation Officer Staff Position	Existing (1995)	Unknown
Water Reuse/Raw Water Systems		
Indirect Use of Effluent Return Flows (for Vail snowmaking)	Existing (1995)	150.0
Treatment Facility Water Conservation/ Efficiency Opportunities	Existing (1996)	36.8
Distribution System Leak Detection and Repair		
System Maintenance, Leak Detection and Repair Program	Existing (1992)	87.2
Non-Revenue Water Committee	Existing (2004)	Unknown
Customer Service	Existing (2003)	8.6
TOTAL QUANTIFIABLE ANNUAL WATER SAVINGS		419.7 AF

Estimated Water Savings

Figure ES-1 illustrates projected demand from 2009 to 2015 with and without the District's targeted water conservation savings of 12% as specified in the District's programmatic water conservation goals (see p. 11). Over the seven year planning period, the savings due to water conservation increases slightly as more programs are implemented and the influence of cumulative effects occur. As stated above, with conservation, approximately 12% of annual projected demand is expected to be saved by 2015 assuming programs and measures are implemented as presented in this Plan.

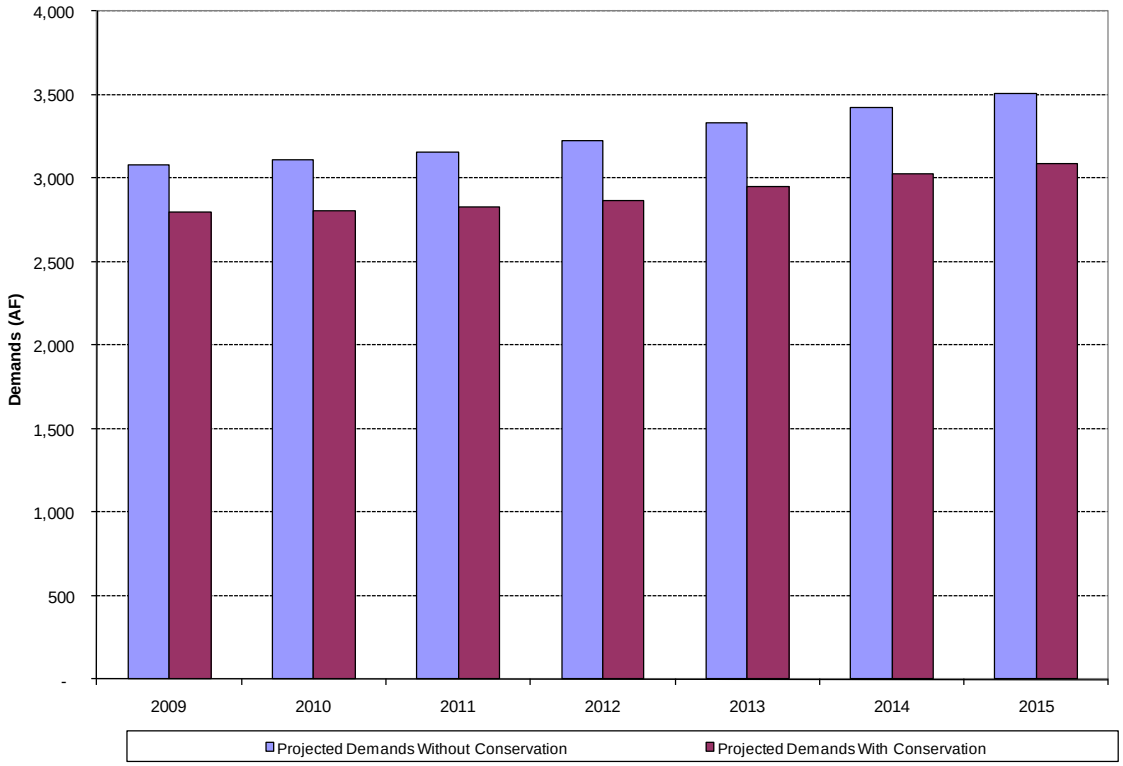

Figure ES-1: Projected Demands With and Without Conservation

Future Water Conservation Efforts

As part of its future water conservation efforts and to ensure its goals are met, the District will document items such as actual costs, estimated water savings, and customers affected when water conservation measures and programs are implemented. Actual program data will be analyzed wherever possible to allow for a more robust and accurate analysis of water conservation savings and costs to be incorporated into any Plan updates and annual monitoring reports. Gaps in existing data will be identified and the data collection program will be expanded as needed. As conditions such as population growth and economic factors affecting tourism and water use habits change, this Plan will be updated as necessary to incorporate the variables that can affect the overall goals of water conservation for the District.

The District acknowledges the efforts of its customers in embracing an ethic of water conservation and for doing their part in being increasingly aware of the value water provides for all who visit the area. As such, the District will continue to engage the community through its public education program, by posting water conservation information via billing inserts, billing messages, website information, and other opportunities to update and inform the public on water conservation matters. Results of the success and effectiveness of various measures and programs will be communicated to the public using these avenues.

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SECTION 1 – INTRODUCTION

Purpose

All water providers that annually supply over 2,000 acre-feet (AF) of water to retail customers are required to have an approved water conservation plan (Plan) on file with the State Office of Water Conservation and Drought Planning pursuant to the requirements set forth in § 37-60-126 Colorado Revised Statutes, or the Colorado Water Conservation Act of 2004 (the Act) (HB 04-1365). Further, if they seek financial assistance from the Colorado Water Conservation Board (CWCB) or the Colorado Water Resources and Power Development Authority, a Plan must be on file. This Water Conservation Plan is submitted by the Eagle River Water and Sanitation District (District) to satisfy these requirements. The District wishes to thank the CWCB, a State agency whose mission is "To Conserve, Develop, Protect and Manage Colorado's Water for Present and Future Generations," for a water conservation planning grant, which helped fund the development of this Plan.

The District adopted its first Water Conservation Plan in 1990 and has periodically evaluated and modified it since that time. In 1995, the District created a part-time Water Conservation Officer position that was increased to full-time in 2003. The recent drought period reinforced the importance of water conservation and prompted the District to reevaluate its water conservation needs. The current Water Conservation Officer was hired in 2007 to update and implement the District's Water Conservation Plan.

Though the District has developed a reliable water supply, there are many evolving factors that can affect the future available water supply and demand and thus require an adaptive management approach. For example, development and redevelopment within and around the District's service area have made it necessary to review and revise water demand projections. Additionally, a portion of the District's water rights augmentation supplies are leased and may be affected by future contract modifications. The resort character of the District's service area also provides a challenge as the majority of occupants are either second homeowners or vacationers, resulting in highly variable seasonal demands. In addition, a large number of people visit the Vail area for just the day in both the winter and summer. Furthermore, the drought of 2002 served to stress the importance of efficient use of water as customers realized that the water they were accustomed to using may not always be available.

All water used in the District's service area originates from Gore Creek or the Eagle River. Therefore, water use in Vail is linked directly to biological and recreational resources that are important to the area's tourism and recreation-based economy. The fundamental resource conservation principles underlying the District's water management and conservation goals are driven by the need to protect streamflows and water quality in Gore Creek and the Eagle River. As such, efficient utilization of water throughout summer and winter periods, when water demands are high, is an important component of the District's goal of protecting and maintaining streamflows.

This Plan is designed to ensure the wise use of water throughout the District's service area in a manner that will help assure its ability to meet existing and future needs. It was developed under the direction of the District's Water Conservation Officer, Community Relations Manager, General Manager, staff, and Board members. Input on the Plan was solicited from the Board of Directors, staff, consultants, the Water Conservation Community Advisory Committee (WCCAC), which represented a wide-variety of stakeholders in the District's service area, and the general public.

Plan Organization

To assist water providers in the development and implementation of comprehensive and effective water conservation plans, the CWCB developed a Water Conservation Plan Guidance Document (guidance document) in 2005. The District's Plan sections are generally structured according to nine planning steps presented in the guidance document, with slight modifications (CWCB, 2005). The following components are discussed in this Plan:

Section 1 – Introduction

Section 2 – Existing Water System

Section 3 – Water Use and Demand Forecast

Section 4 – Proposed Facilities

Section 5 – Conservation Goals

Section 6 – Conservation Measures and Programs

Section 7 – Evaluation and Selection of Conservation Measures and Programs

Section 8 – Impacts of Proposed Conservation

Section 9 – Implementation, Monitoring, and Evaluation Plan

Appendix A – Calculation of Water Savings for Current Conservation Measures and Programs

Appendix B – Comprehensive List of Conservation Measures and Programs

Appendix C – Initial Ranking of Conservation Measures and Programs

Appendix D – Summary Information for Evaluated Conservation Measures and Programs

Appendix E – 30-Day Public Comment Period Resolution

Appendix F – Public Notices

Appendix G – Public Comments

Appendix H – Adoption of Eagle River Water & Sanitation District's Water Conservation Plan

Appendix I – References

Public Participation in Plan Development

Public participation will play a key role in the overall success of the District's Water Conservation Plan. Many of the District's measures and programs rely upon residents to respond by modifying their water use habits, taking part in rebate programs, and participating in education programs to achieve desired water savings. Due to the public's critical function in the outcome of many of the District's water conservation measures and programs, public input is highly valuable and has been sought throughout development of this Plan in various manners as described below. The following meetings were conducted during the Plan development process to inform the public about the water conservation Plan and provide opportunities for comments.

WaterWise Wednesday Meeting

The Eagle River Watershed Council organizes a monthly public forum on water issues called "WaterWise Wednesdays." The May 28, 2008, meeting held at the Avon Public Library, was devoted to the District's Water Conservation Plan. An overview of the Plan's development was hosted by District staff and included discussion of the existing and proposed water conservation measures. Attendees were asked to provide feedback on the conservation measures and rank them based on their anticipated participation level. A copy of the notice for the meeting is provided in Appendix F.

Water Conservation Community Advisory Committee Review (WCCAC)

The Water Conservation Community Advisory Committee, a group of community stakeholders formed for development of this Plan (discussed in detail in Section 6, p. 65), was given opportunity to comment on the Plan numerous times, the first was providing feedback on the comprehensive list of water conservation measures and programs. The WCCAC was asked to rank each measure and program based on the likelihood of their participation in the measure or program. This information was used in the initial ranking process described in Section 6 (p. 67) and presented in Appendix C.

Comment was also solicited from the WCCAC on the additional steps undertaken in the evaluation of the water conservation measures and programs. Specifically, they were presented with costs and water savings, evaluation criteria and program descriptions for each measure or program. Additionally, the WCCAC was asked to respond to the list of measures and programs selected for implementation.

During finalization of the Plan, the WCCAC was asked to provide input on the overall Plan during the public review process/public meeting. It is anticipated that the group will also help the District with program implementation, especially in their respective areas of expertise.

District Board Subcommittee Participation

Two members of the District's elected Board of Directors participated in two workgroup sessions to review the Plan at various stages and to provide input and suggestions prior to presentations to the whole 7-member Board. This Subcommittee was formed to discuss certain topics included in the Plan and to give the two members an opportunity to develop a more detailed understanding of the Plan and its contents. They were integral in providing the project team with an indication of the Board's perspective of the Plan and in raising any questions or issues they felt would be common among all the Board members.

Public Review Process

The District Board approved a resolution on December 18, 2007, that set forth as the District's practice that draft plans available for public review and comment would be subject to a minimum 30-day review period before final approval by the Board.

A draft copy of the Plan was presented to the Board at its January 26, 2012, meeting. The Board approved a 30-day public comment period, which started on January 26 through February 24, 2012. Public input on the draft Plan was solicited via notices posted on the District's website (http://www.erwsd.org); a news brief published in the Vail Daily Newspaper; and information included on customer bills. Notices were also posted and the Plan made available for review at the following locations:

The Avon Public Library – 200 Benchmark Road, Avon, CO
Vail Public Library – 292 W. Meadow Drive, Vail, CO
District's Vail Office – 846 Forest Road, Vail, CO

A copy of each communication is included in Appendix F. Comments on the draft Plan could be submitted via phone, in person, mail or e-mailed to the District's Water Conservation Officer. Comments are summarized in Appendix G.

The District Board adopted the Plan on March 22, 2012, at a public Board Meeting.

Approval/Adoption of Plan

On March 22, 2012, the District's Board passed a resolution thereby adopting this Water Conservation Plan, a copy of which appears in Appendix H. The District is eligible to apply for a Water Efficiency Grant through the CWCB to assist in implementing conservation measures and programs by having an approved document in place

SECTION 2 – EXISTING WATER SYSTEM

Physical Characteristics of the Existing Water Supply System

The Eagle River Water & Sanitation District is a quasi-municipal corporation and a political subdivision of the State that was formed on July 1, 1996, with the consolidation of the Upper Eagle Valley Consolidated Sanitation District and the Vail Valley Consolidated Water District. An elected Board of Directors oversees the District's activities, which are carried out by approximately 94 staff working under the following mission statement: "[The] Eagle River Water & Sanitation District provides efficient, effective, and reliable water and wastewater utility services in a manner that respects the natural environment."

Service Area

The District provides potable water and wastewater services for the Town of Vail and mixed use developments near Wolcott, which is approximately 20 miles west of Vail. A map of the District's service area is provided in Figure 2-1. Vail is a resort community and therefore the majority of housing units are multi-unit condominiums and townhomes or hotel rooms. Many are second homes that are unoccupied a large percentage of the time. The full-time population of Vail is approximately 4,800 residents but the District's water service area population during high occupancy periods can reach up to 25,000 people (see Section 3 for population discussion). Water usage therefore varies seasonally depending upon dwelling unit occupancy rates and outdoor water uses. The Wolcott area is currently predominantly agricultural land, but it is anticipated that rapid commercial and residential development will occur there within the next decade.

In addition to providing potable water service to the Vail and Wolcott areas, the District operates the wastewater collection and treatment system that serves the Towns of Vail, Minturn, and Avon, and many large mixed use developments in unincorporated areas, including Arrowhead, Beaver Creek, Berry Creek, Eagle-Vail, Edwards, Bachelor Gulch, and Cordillera. The District also provides billing of water and trash service charges for the Town of Minturn. Although the District serves multiple areas in the Vail Valley, this Plan was developed for the District's Vail water service area only, as shown in Figure 2–1.

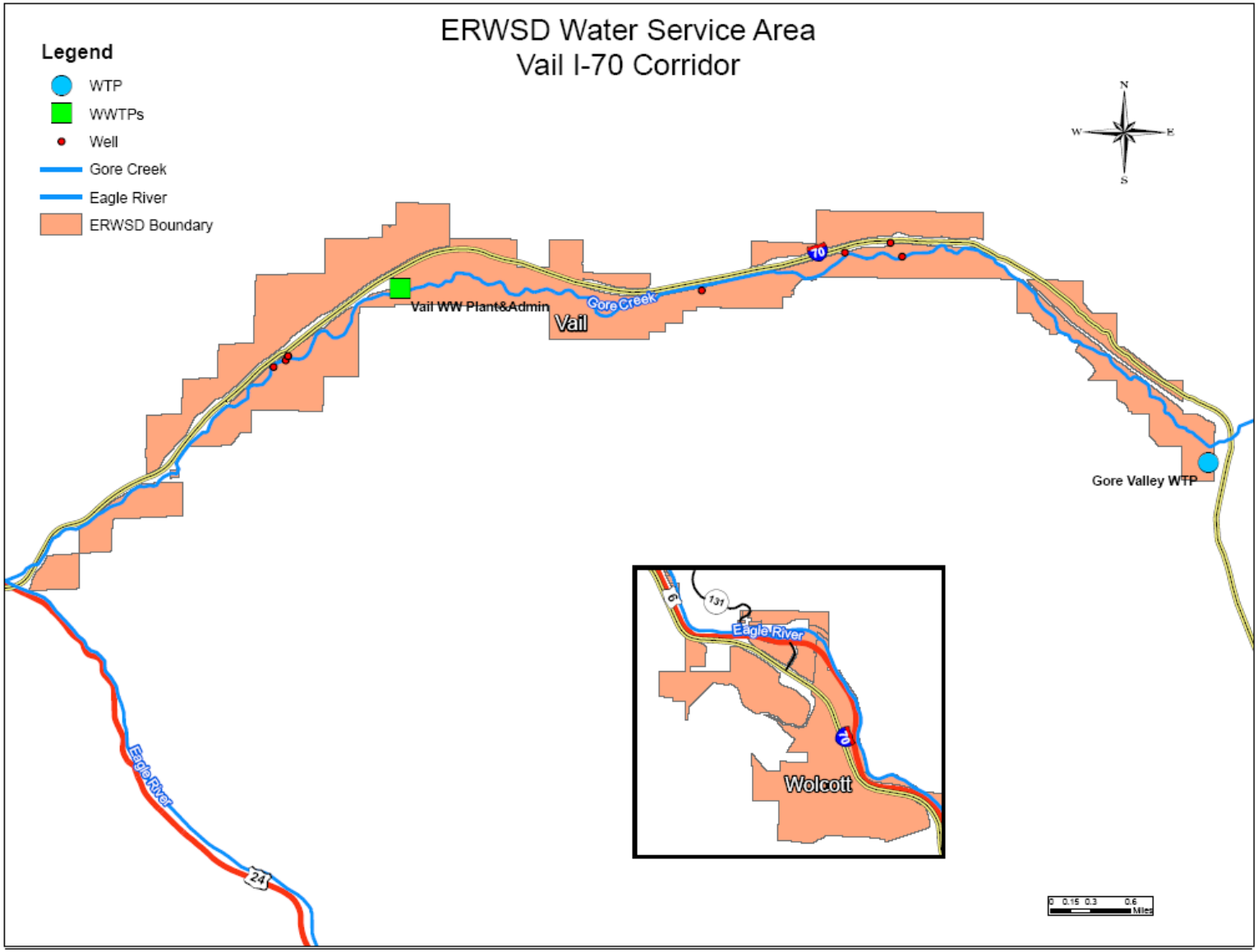


Figure 2-1: Eagle River Water and Sanitation District Water Service Area

Water Treatment and Distribution

The District's water treatment system consists of a 1.0 million gallon per day (MGD) microfiltration plant in East Vail and seven groundwater wells with wellhead chlorination systems located along Gore Creek. The Gore Valley Drinking Water Facility, located in East Vail, can operate as an emergency back-up source by treating surface water from Gore Creek. The District has 12 water storage tanks with a total storage capacity of 8.5 MG (26.11 AF). Peak day production can reach 7.0 MGD, which typically occurs in the summer due to irrigation combined with high occupancy rates associated with special events and holiday weekends. Average daily demand over the course of the year is approximately 2.5 MGD. Nearly 64 miles of water main distribute treated water to the District's customers. The District also shares a water system interconnect in Dowds Junction with the UERWA to enhance stream flows during low flow periods.

Wastewater Treatment

The District operates the following three wastewater treatment plants (WWTP) that have a total treatment capacity of 9.95 MGD:

- Vail WWTP – constructed in 1969, expanded in 1982; 2.7 MGD capacity
- Avon WWTP – constructed in 1966, expanded in 1997; 4.3 MGD capacity
- Edwards WWTP – constructed in 1981, expanded in 2001; 2.95 MGD capacity

Most of the wastewater from the Vail water supply service area is treated at the Vail WWTP. Wastewater from the western portion of Vail's service area is conveyed to the Avon WWTP. The average daily flow through the wastewater system is 5.5 MG with the maximum peak daily flow of 7.7 MG and a minimum daily flow of 3.7 MG.

Water Deliveries

Table 2–1 provides a summary of the District's Vail Water System, including information on supplies, accounts, water use, sales, and demands during 2007. The District's average year demand is just under 1.0 billion gallons.

Residential use, which includes both single and multi-unit housing, and Nonresidential use, which includes Commercial and Mixed accounts, accounted for very similar percentages of the total water use in 2007 at 33% and 32%, respectively. Descriptions of the District's account types are provided in Section 2. However, use-per-connection for Nonresidential accounts was 1,490,000 gallons, which is much higher than the 118,000 gallons per connection used by residential accounts. Although the District's Irrigation and Sprinkler accounts were relatively small in terms of their percentages of use in 2007 (with only 5% of the total), the water use for the individual Irrigation and Sprinkler accounts was the second highest on a "per connection" basis.

Total dollar amounts billed by account type are also shown. The District's water sales for 2007 totaled nearly $2.68 million, with Mixed Use accounts contributing over half that amount, just over $1.4 million. More detailed historical water use data are provided in Section 3.

Table 2-1: Vail Water System Profile (based upon 2007 data)

SERVICE CHARACTERISTICS			
Estimated average service area population	12,969 (includes overnight guests but does not include up to 10,000 day visitors)		
Estimated service area (sq. miles)	4.05 (Vail only)		
Miles of mains	64.18 miles water mains; 54.34 miles sewer mains in District Vail service area		
Number of treatment plants	1 water treatment plant; 2 wastewater treatment plants (influent from the Vail service area is treated at the Vail and Avon WWTPs)		
Number of groundwater wells	7		
Number of separate water systems	1		
Interconnection with other systems	1 (with Upper Eagle Regional Water Authority)		
ANNUAL WATER SUPPLY	**Annual volume (1,000 gallons)**	**Number of intakes or source points**	**Percent metered**
Groundwater	919,561	7	100%
Surface water	2,570	3[1]	100%
Purchases: raw	----	----	----
Purchases: treated	66,399	----	100%
Total annual water supply	988,530	8	100%
SERVICE CONNECTIONS	**Connections**	**Water sales ($)**	**Percent metered**
Residential	2,760	$362,718	100%
Commercial	166	$755,277	100%
Mixed Use	49	$1,425,792	100%
Industrial	----	----	----
Public or governmental	----	----	----
Wholesale	----	----	----
Other (separate irrigation lines)	117	$131,711	100%
Total connections	3,092	$2,675,498	100%
WATER DEMAND	**Annual volume (1,000 gallons)**	**Percent of total**	**Per connection (1,000 gallons)**
Residential sales	325,483	33%	118
Nonresidential sales	320,307	32%	1,490
Wholesale sales	0	0%	0
Other (separate irrigation lines)	48,020	5%	410
Non-Revenue Water: authorized uses	17,956	2%	----
Non-Revenue Water: unauthorized uses	281,502	23.8%[2]	----
Total system demand (total use)	993,268	100%	2,018
AVERAGE & PEAK DEMAND	**Volume (1,000 gallons)**	**Total supply capacity (1,000 gallons)**	**Percent of total capacity**
Average-day demand (year-round)	2,530	9,475	27%
Peak season (summer) July	3,990	9,475	42%
Peak season (winter) Nov	1,740	9,475	18%
Maximum-day demand (summer)	5,680	9,475	60%
Maximum-day demand (winter)	3,720	9,475	39%
Maximum-hour demand	----	----	----
PLANNING	**Prepared a Plan?**	**Status**	**Completion date**
Capital, facility, or supply plan	2008 Water System Master Plan Update	Complete	August 2008
Drought or emergency plan	Stage 3 Water Supply Emergency Plan	Complete	Approved by District Board April 2005
Water Conservation Plan	2008 Water Conservation Plan	Started implementation in 2009	Report completed December 2011

[1] Sources include Gore Intake, Avon Raw Water Booster Pump Station, and the Metcalf Headgate

[2] Although the rest of Table 2-1 shows 2007 data only, the Non-Revenue Water value of 23.8% is the 2000 to 2007 average.

Sources of Water

Water Rights

The District has a portfolio of water rights which have been secured and integrated into plans for augmentation by the Water Court to ensure a year-round, reliable water supply for present and future needs. The District has surface water and groundwater rights, including direct flow and storage rights. A number of the direct flow rights were historically used for agricultural irrigation and livestock uses in the Vail Valley but have since been changed to municipal and other beneficial uses as the area became developed. These water rights were incorporated into a plan for augmentation that was filed in 1982 and approved by the water court in 1986. The augmentation sources for this 1982 plan for augmentation include 300 AF of storage in Black Lakes, 934 AF of storage in Green Mountain Reservoir, and 902 AF of quantified historic consumptive use credits that resulted from the former irrigation water rights in the Vail Valley. That plan allows the District to divert approximately 4,350 AF per year.

Since 1982, the District has adjudicated three supplemental plans for augmentation, which include 330 AF of storage in Eagle Park Reservoir, two plans each providing 125 AF (250 AF total) of storage in Homestake Reservoir and an enlargement of 125 AF in Black Lake No. 1, as additional augmentation sources. Another supplemental plan for augmentation is currently pending, which would allow the District to use an additional 500 AF of storage in Wolford Mountain Reservoir as an augmentation source. The District also has 12 additional AF of storage water in Eagle Park Reservoir that resulted from a recent enlargement of that reservoir. Cumulatively, the District has or will have rights to approximately 3,353 AF of augmentation water.

Under the Plan for Augmentation, the District can provide up to 603 AF of snowmaking water at the Vail Ski Area and 174.2 AF for irrigation at the Vail Golf Course. The District can divert its raw water supplies year round from several alternative points of diversion on Gore Creek and the Eagle River.

The in-house municipal and irrigation diversions of the District generally operate in priority during the snowmelt runoff season (typically May into July), or as a preferred beneficiary of Green Mountain Reservoir. When out of priority, the District's diversions are augmented by decrees of the District Court in and for Water Division No. 5 entered in Case Nos. 82CW328, 98CW204, and 98CW270. Applications for additional augmentation and exchange plans are pending in Case Nos. 06CW96 and 09CW28.

Groundwater

The District’s primary sources of potable water are five wells (Wells R1, R2, R4, R6, and R7) located in the Gore Creek alluvium. The combined capacity of these wells is approximately 7.87 MGD or 12.17 cubic feet per second (cfs). Additionally, two wells located in West Vail (West Vail Wells 7 and 8), and an infiltration gallery located in East Vail (Gore Valley Drinking Water Facility) provide supplemental water supplies as needed. The combined capacity of the supplemental sources is approximately 1.57 MGD or 2.42 cfs.

Reservoir Storage

The District’s raw water storage supplies include Black Lakes, Eagle Park Reservoir, Homestake Reservoir, and water stored in Green Mountain Reservoir, which is available for augmentation under a contract with the U.S. Bureau of Reclamation. As mentioned above, reservoir storage for the District includes 352 AF in Black Lake No. 1; 73 AF in Black Lake No. 2; 342 AF in Eagle Park Reservoir; 250 AF in Homestake Reservoir; 934 AF in Green Mountain Reservoir; and 500 AF in Wolford Mountain Reservoir.

Due to its reliable, year round alluvial groundwater supply, the District operates its water supply system differently in comparison to many Front Range municipalities. For example, the District does not normally rely on its reservoirs as a direct source of water for its customers as many Front Range communities do for a significant portion of their supply. Rather, the District’s

reservoirs are used for augmentation of out-of-priority depletions that occur primarily in the late summer and winter months. In addition, the District uses reservoir storage to maintain and enhance streamflows during low stream flow conditions.

Efficiency Component of District's Water Supply System

The District's water supply system has been designed to maximize efficiency. As illustrated in Figure 2-2, this occurs through the following sequence:

- Most of the water supply for the Vail service area is diverted from Gore Creek in the vicinity of the Vail Golf Course via alluvial wells and the surface water diversion for the Gore Valley Drinking Water Facility.
- Irrigation return flows accrue to Gore Creek throughout the Town of Vail, and the Vail WWTP outfall is located to the west of Vail Village at Forest Road.
- The primary source of water for snowmaking at the Vail Ski Area is Gore Creek, approximately 100 feet downstream from the Vail WWTP outfall, used mostly during the months of November, December, and January (although snowmaking could extend from October through March, if necessary).
- During low streamflow months (November through February), 20% to 30% of the streamflow at the snowmaking intake is from wastewater effluent. Current snowmaking water demands at Vail average about 400 AF per year, of which 80 to 120 AF is composed of effluent return flows from the Vail WWTP. In the future, it is anticipated that this demand will increase to 603 AF per year with an effluent return flow component of 120 to 180 AF per year.
- A second snowmaking water diversion for the Vail Ski Area is located at the confluence of Gore Creek with the Eagle River. This facility diverts water from the Eagle River and Gore Creek and includes effluent return flows from the WWTPs at Vail and Red Cliff. The District has entered into an agreement with Vail Associates under which this facility will be used for domestic water supply purposes in addition to snowmaking.
- Water for the UERWA Avon Drinking Water Facility is diverted from the Eagle River at the Metcalf intake in Eagle-Vail and Raw Water Booster Pump intake in Avon, also resulting in use of effluent return flows from the Vail and Red Cliff WWTPs.
- An interconnecting water main conveys water from the Avon Drinking Water Facility to the Vail water system during the fall and winter, providing additional capacity for use of effluent return flows from the Vail and Red Cliff WWTPs.
- Water for snowmaking at the Beaver Creek Ski Area is diverted from the Eagle River below the Beaver Creek confluence at Avon, resulting in additional use of effluent return flows from the Vail and Red Cliff WWTPs.
- Irrigation return flows accrue to the Eagle River throughout Eagle-Vail, Avon and Edwards, and the Avon WWTP outfall is located in Avon about 0.5 miles downstream from the Beaver Creek confluence.
- Water for the UERWA's Edwards Drinking Water Facility is diverted from the Eagle River in Edwards approximately 3 miles downstream from the outfall of the Avon WWTP, which allows use of effluent return flows from the Avon, Vail and Red Cliff WWTPs.
- Additional irrigation return flows accrue to the Eagle River through Edwards and the Edwards WWTP outfall is located west of Edwards about 0.3 miles upstream from the Squaw Creek confluence.
- In the future, water will be diverted from the Eagle River below the Edwards WWTP for the District's Wolcott service area, allowing use of effluent return flows from the Edwards, Avon, Vail, and Red Cliff WWTPs.

It is important to note that all of the District's WWTPs provide advanced tertiary treatment, and water diverted from Gore Creek and the Eagle River at all of the locations described above meets all applicable Drinking Water Standards. The sequence of water diversions and return flows described above serves to maintain and protect streamflows, water quality, and water supply reliability, in contrast to transmountain water diversions which are 100% consumptive to the basin of origin.

During the last several years, there has been a great deal of concern about the need for protection of streamflows and aquatic habitat in both Gore Creek and the Eagle River in the face of growing demands for water. In response to these concerns, the District and other major water users in the Eagle River Basin have undertaken a number of specific actions designed to conserve water, improve water management, enhance instream flows, and mitigate the impacts of water diversions. The following is a summary of conservation and water supply management practices that have been previously implemented and improvements that are to be implemented in the future:

- The development of the Black Lake Enlargement Project completed in 1993, combined with a recently completed second enlargement, provides 425 acre feet of storage and is operated to meet the instream flow requirements of the Colorado Water Conservation Board for Gore Creek.
- The District, in cooperation with other water users, participated in the development of Eagle Park Reservoir, which provides 3,148 acre-feet of in-basin storage for augmentation of water rights and streamflows during the low-flow periods.
- The District and other water users have entered into an agreement with the cities of Aurora and Colorado Springs for the use of 1,000 acre-feet of in-basin storage in Homestake Reservoir as a source for augmentation of streamflows during low flow periods.
- In 1997, the Vail Mountain Ski Area completed construction of the snowmaking intake facility at the mouth of Gore Creek. This allows the ski area to effectively utilize in-basin sources of augmentation available from Eagle Park and Homestake Reservoirs, which enhance winter instream flows in the East Fork of the Eagle River, Homestake Creek and the mainstem of the Eagle River. The District has entered into an agreement with Vail Resorts for use of the snowmaking intake as an alternative point of diversion for municipal uses that will be used during low flow periods to protect streamflows in Gore Creek.
- In 1997, the Beaver Creek Ski Area completed the Western Hillside Reservoir, which provides operating storage that enhances the operational efficiency of the snowmaking system and buffers the impacts of snowmaking operations on streamflows in the Eagle River.
- The District participates in the development of watershed management programs for Gore Creek and the Eagle River that facilitate cooperative efforts to monitor water quality, instream flows, and aquatic life. Information developed through these efforts is used to improve efficiency and water management programs in the Eagle River Basin.

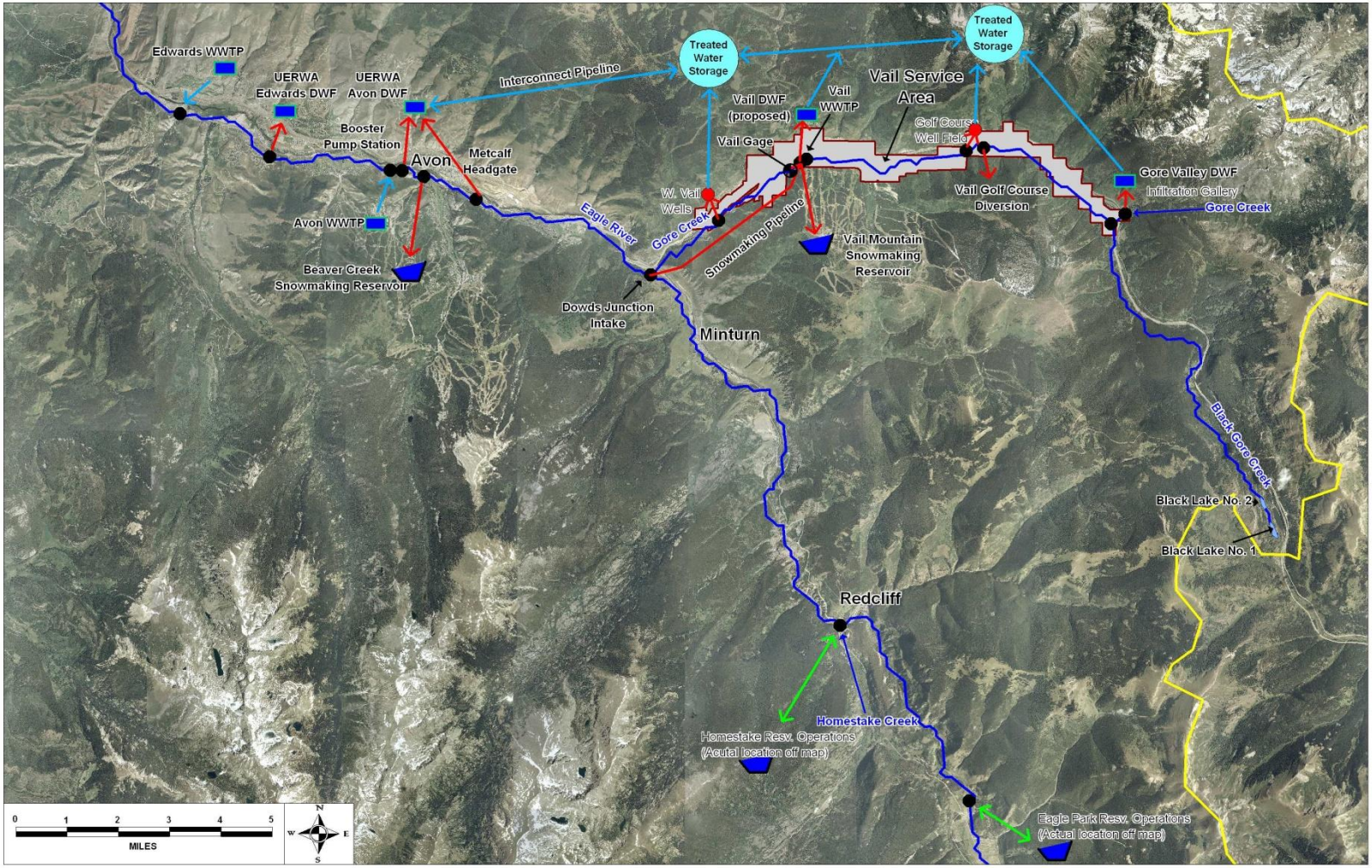


Figure 2-2: Map and Schematic of Efficiency Component of the District's System

System Conditions and Limitations

A summary of system conditions is provided in Table 2-2. The District's water supply system is fully adequate to meet existing demands and provide a stable and reliable water supply. However, as the District's service area population grows, additional infrastructure and conservation will be needed to reliably meet future demands. The District's 2008 Vail Water System Master Plan Update (Schmueser Gordon Meyer, Inc., 2008) identifies alternatives comprised of suites of projects to meet water needs, including: increased production capabilities, new treatment facility, re-drilling of groundwater wells, increased fire flow capacity, and upgraded pipelines within the system. The District also anticipates that it may eventually need to develop new water and wastewater treatment plants to service the community of Wolcott. It has purchased land in the area for this purpose.

Though the District's service area in Vail is not likely to grow significantly, redevelopment efforts will continue to increase population density and the number of commercial establishments. Exact data regarding future development and redevelopment plans are changing and evolving in response to local and national economic conditions, which creates uncertainty and difficulty in forecasting demands. The District's lease of Green Mountain Reservoir water for augmentation may be affected by future contract modifications. The District is currently acquiring and developing additional augmentation sources which will become permanent sources of supply to satisfy current and future demands.

Table 2-2: Summary of System Conditions

Planning Questions	Yes	No	Comment
Is the system in a designated critical water supply area?		√	
Does the system experience frequent shortages or supply emergencies?		√	
Does the system have substantial unaccounted for and lost water?	√		From 2000 through 2007, non-revenue water comprised an average of approximately 23.8 percent of total water produced by the District. To address this, a Non-Revenue Water Committee was formed, and a water loss consultant hired. Accounting spreadsheets and manuals are also being developed to better understand and track non-revenue water.
Is the system experiencing a high rate of population and/or demand growth?	√		Eagle County has among the highest population growth of any county in Colorado. Significant population growth in the area is expected over the next ten years, as predicted by a recent master plan and a 2006 Assessment. The steady growth is mainly seasonal. As of 2007, the number of Single Family Equivalents (SFEs) in Vail was 9,076. By 2015, the number of SFEs is projected to be 10,719, or an 18.1% increase.
Is the system planning substantial improvements or additions?	√		The District is planning a number of projects that will increase the capacity of the system to meet projected future demands.
Are increases to wastewater system capacity anticipated within the planning horizon?	√		The District anticipates expanding its Avon wastewater treatment facility in the near future, when the current facility is expected to reach 80% of its design capacity. Upsizing of sewer mains to meet capacity needs is also planned for primary mains.

Water Costs and Pricing

Customer Account Types

The District classifies each customer account according to the following types:

Residential accounts include both single and multi-unit residential housing, e.g., single family homes, condominiums, townhouses, duplexes, multiplexes, apartments, efficiency and accommodation hotel rooms, or mobile homes.

Commercial accounts include those delivering water to any structure or facility that is used to engage in a business, commerce, manufacturing, marketing, and/or sale of products and services of any kind, and is not habitable.

Mixed Use accounts include facilities containing one or more Residential units and one or more Commercial units within the same structure, e.g., a hotel account with a restaurant, and/or retail space in the hotel structure.

Hydrant accounts represent usage from meters that are able to be rented seasonally (April 15 – October 15) and placed on a fire hydrant in order to record water usage. The water is not to be used for landscaping or establishing seedlings but rather used to control dirt at construction sites or for other construction needs when main line connection at the construction site has not been made.

Irrigation accounts are separately metered outdoor use accounts with no associated structure(s) or tap fees, e.g., most parks.

Sprinkler accounts are separately metered outdoor use accounts associated with a structure(s) for which tap fees have been paid. Examples include a common area irrigation system serving a condominium association, individual home, or business.

Authorized Unbilled water use is estimated and includes un-metered water use such as system usage incurred through events such as fire department use, main line flushing, tank overflow or system leaks. The Vail Fire Department and the Eagle River Fire Protection District provide monthly reports with estimates of training and fire suppression water use. The District keeps logs of water use estimates when main lines are flushed to clean the system of contaminants or debris. Authorized Unbilled water also includes Dowds Junction Interconnect transfers of water between Vail and the UERWA (only the water received from the UERWA via the Interconnect was included in the data presented in Section 3).

Non-Revenue Water is estimated as the difference between water production numbers and metered and estimated water use. Non-Revenue water accounts for a large percentage (approximately 23.8% for the 2000 through 2007 period) of total water produced. In 2007, the District's Non-Revenue Water Committee (NRWC) began a renewed effort to review and evaluate Non-Revenue water. The committee's work is ongoing and Non-Revenue water is addressed in this Plan.

Single Family Equivalent (SFE)

An SFE is a statistical unit estimated to have an impact upon the water and sewer systems equal to an average single family of 2.3 persons; this includes outdoor use. The SFE metric is used by many water utilities to determine rates and fees, track development growth, and project water demands. The District has found this methodology to be extremely accurate in predicting actual water use. When establishing new Commercial, Residential, and Mixed Use customer accounts, the District assigns SFEs based upon the guidelines provided in Table 2-3.

SFE, SIR, and SIC Designations

Each customer account has an associated Single Family Equivalent (SFE), Sprinkler Irrigation Ratio (SIR), or Sprinkler Irrigation Coverage (SIC) number. This information is provided by the District on each water bill.

Table 2-3: SFE Assignment Guidelines

Account Type	Description	SFE Equivalent
Residential	Units up to 3,000 square feet with a cooking facility	1.0
	Units greater than 3,000 square feet with a cooking facility	Proportional increase in SFE
Efficiency	Single room with a bathroom and a cooking facility	0.5
Accommodation (Lodging/Hotel)	Room with or without a bathroom, but without a cooking facility with private access to a central corridor or the outside	0.35
Commercial	¾ inch meter	1.5
	1 inch meter	2.6
	1 ½ inch meter	5.8
	2 inch meter	10.3
	3 inch meter	23.0
	4 inch meter	40.9
	6 inch meter	92.1

Sprinkler Irrigation Ratio (SIR)

SIRs are applied to all sprinkler accounts as well as irrigation accounts for which the area to be irrigated has not been defined. The SIR is linked to the total SFE count of structures linked to the sprinkler account, e.g., 2.5 SFEs equals 2.5 SIRs. These irrigation accounts are arranged in a way so as to not penalize customers with two meters (one for in-home use and one for irrigation) compared to customers with one meter combining in-home and irrigation use. Thus, approximately the same amount of water usage should be reflected on the one meter bill and two meter bill (although the customer with two meters will get two separate bills, together equaling the same charge as if they only had one meter).

Sprinkler Irrigation Coverage (SIC)

SICs are applied to irrigation accounts for which the area to be irrigated has been defined. One SIC is equal to one irrigated acre. Irrigation accounts are assigned an SIC count, which is calculated as the acreage being irrigated rounded to the nearest tenth.

More detailed information regarding SFE, SIR, and SIC assignment and associated rates and fees is available in Appendix A of the District's Rules & Regulations for Water and Sewer Service. This document can be requested from the District or found on its website (http://www.erwsd.org/).

Water Service Rates

The District bills customers each month for their actual water use. Since June 2003, The District has had rate structures in place that differ by account type. All rates are tiered, with costs rising with increasing use as show in Table 2-4. Rates are reviewed on an annual basis and have been adjusted just as frequently in recent years, as presented in Figure 2-3. In 2003 and 2004, rates were adjusted effective at the beginning of the year, and again at the start of the summer irrigation season.

Residential, Commercial and Mixed Use customers are charged a monthly base fee in addition to an inclining rate per volume of water used. Base fees are per SFE for Residential, Commercial, and Mixed Use accounts; per SIR for Sprinkler and Irrigation accounts for which acreage is unknown; and per SIC for Irrigation accounts for which irrigated acreage is known (Table 2-4). Customers must multiply the SFE (or SIR or SIC) count associated with their account by the rates in the table to determine their specific account's base fees. SFEs, SIRs, and SICs, are described above under the "SFE, SIR, and SIC Designation" section.

Table 2-4: 2008 Water Rate Structures

Account Type	Description	Base Fee	Gallons Used (per SFE, SIR, or SIC)	Rate per 1,000 gallons
Residential, Commercial and Mixed Use	Metered accounts (per SFE)	$12.16 (per SFE)	0 – 10,000	$1.84
			10,001 – 40,000	$3.51
			40,001 and above	$5.50
Sprinkler	Accounts associated with a structure but on a separate meter (per SIR)	N/A	0 – 7,000	$1.84
			7,001 – 40,000	$3.51
			40,001 and above	$5.50
Irrigation	Accounts not associated with a structure, and for which square footage or acreage to be irrigated *cannot* be defined (per SIR)	N/A	0 – 10,000	$4.32
			10,001 – 40,000	$6.48
			40,001 and above	$9.20
	Accounts not associated with a structure, and for which square footage or acreage to be irrigated *can* be defined (per SIC)	N/A	0 – 175,000	$4.32
			175,001 – 234,000	$6.48
			234,001 and above	$9.20

N/A: Not Applicable

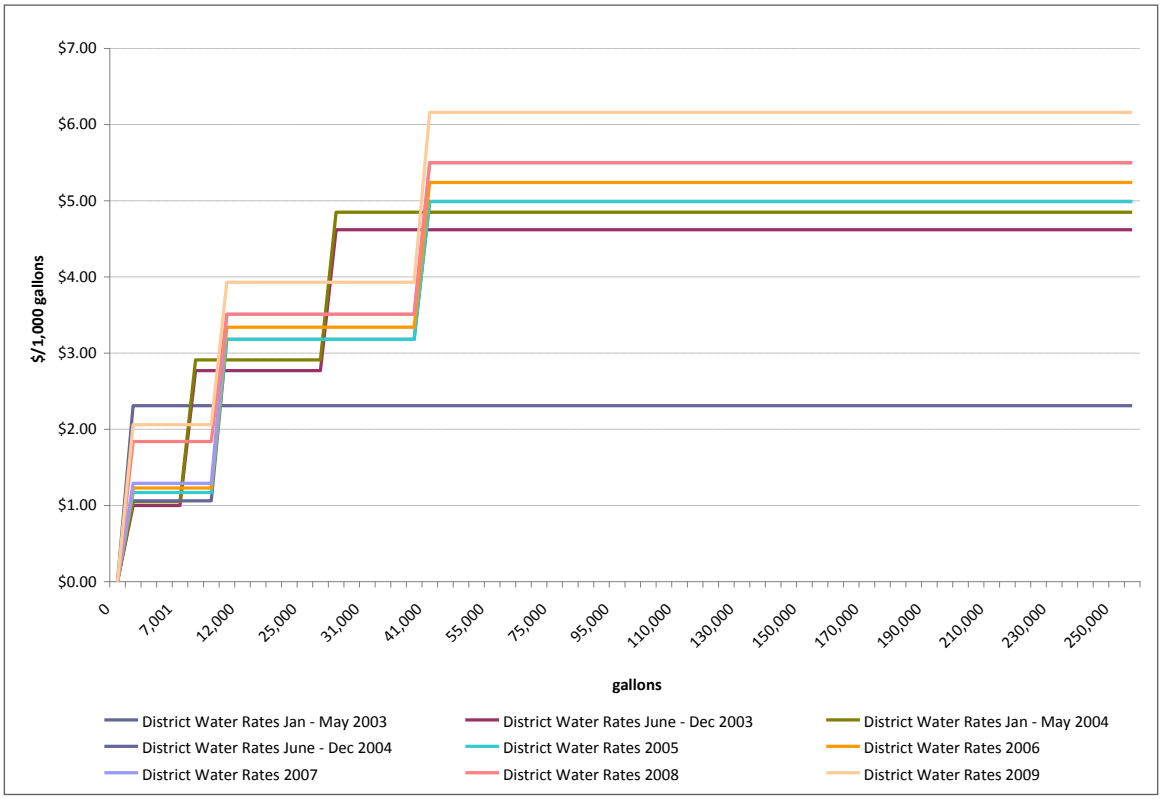


Figure 2-3: Tiered Water Rates from 2003 – 2009

It should also be noted that apartment and multi-unit dwellings are usually metered by building, or building segment, rather than by individual unit. As a result, while the Homeowners Association (HOA) or building management company typically receives the bill based upon actual water use, renters, and oftentimes unit owners, generally do not receive this information.

Metering

All taps in the District's service area are metered, with the exception of those associated with authorized unbilled uses as described under the "Customer Account Types" section. Meter age is tracked by the District, and the average age of meters in the service area is seven to ten years. Individual meters are read on a monthly basis. Following each month's reading, the District's Meter Services Coordinator/Backflow Administrator reviews an automatically generated "high-low exception" report. This report shows readings that are out of the normal range for each account based upon historical use. High and low readings are investigated and on-the-ground inspections are often performed, unless the meter reader is aware of common unusual patterns which are expected for certain accounts. The District has found that the majority of high readings in second homeowner accounts result from leaking toilets, malfunctioning home water treatment systems (extra purification systems installed in water lines such as reverse osmosis, softening systems, or filter systems under sinks), or irrigation system problems (during summer months). Low readings are usually due to broken meters or infrequent usage due to the customer being out of town or a second homeowner. The District's Customer Service Department documents all unusual patterns for individual accounts. They also send out letters questioning the customers' occupancy patterns so they can note any expected unusual readings for future reference.

The District has implemented various meter replacement programs since 2002 and 2003. Since that time, almost all of the residential meters have been converted to meters with higher standards for accuracy.

In late 2005 and early 2006, large hotel and condominium meters were replaced in Vail, in response to the District's NRWC attempt to address non-revenue water issues. This replacement

program was a continuum of the District's residential meter replacement program but specifically targeted larger meters (2 inch diameter and above) in Vail due to a higher expectancy of water loss. The District did not identify large numbers of broken meters during this replacement project to explain the non-revenue water. However, meters were tested based on the American Water Works Association (AWWA) standard of meter testing frequency, which ranges from every year to every five years depending on meter size. If a meter is within AWWA standards (98.5% to 101.5% accuracy for a variety of conditions) it will be put back into the system for future use. If the meter fails the quality control tests, it is sent back to the manufacturer to be recycled for parts, and a new meter is installed.

Billing

The District's water utility billing system includes charges for water and sewer use, user fees, and capital costs. In 2007, the District billed $2.68 million in water sales. A review of recent water sales and revenue revealed no unusual billing or revenue issues. The District has an "A" bond rating from Standard & Poor's, based on the stability of the water revenue source. A bond rating is a standard score issued by independent agencies to provide assurance to potential bond purchasers of the quality of the District's financial ability to repay the bond obligation. The District is audited annually and has passed all audit requirements with no major issues.

Customers in Vail are billed monthly based on meter readings taken at the end of the preceding month. The Wolcott area is not billed as the District has no customers there yet.

To improve Customer Service, billing and tracking capabilities, the District implemented a new utility billing system in September 2008, which is currently fully operational. The replaced system was 14 years old with outdated technology that could only provide current billing production and not associated customer or graphic information. The District's new billing software is a Customer Information/Billing System that will allow the District to use Geographic Information Systems to define the service boundaries. The new system will combine billing with more detailed and accurate customer account information such as consumption patterns, transaction history, historical contact information, and payment information. This will enhance the District's customer service capabilities to its internal and external customers alike. The new billing system may also prove useful in monitoring and evaluating customer use and water conservation-related savings.

Current Policies and Planning Initiatives

2008 Vail Water System Master Plan Update

The District hired the engineering firm Schmueser Gordon Meyer (SGM), to develop an updated Vail Water System Master Plan. The Master Plan Update, completed in August 2008, identifies recommended water system improvements to meet projected future demands and water storage needs, increase system reliability, and improve fire flow delivery. Rapid on-going and near-term redevelopment in Vail drove the need to update the 2002 Vail Water System Master Plan.

Non-Revenue Water Committee

Due to the impact Non-Revenue Water has on the District's system, it has been assigned various names over the years to conform to and stay up to date with AWWA standards. It began as Non-Revenue, was changed to Water Loss and is currently Non-Revenue. To reduce Non-Revenue Water due to metering inaccuracy, un-metered usage, and distribution system leakage, the District has implemented an aggressive monitoring program and established the internal NRWC to coordinate and monitor efforts to reduce Non-Revenue Water in the District and UERWA water distribution systems.

In 2005, the District retained HDR (consulting engineers) to conduct a detailed audit using modern accounting standards and procedures to more accurately determine the amount of Non-Revenue Water in the distribution system. This effort included the development of a sophisticated accounting program, procedures for data management and interpretation, water loss reduction programs, and organizational strategies for program implementation and management.

In conjunction with the enhancements to the water accounting system, the District is continuing to implement a comprehensive water loss reduction program. Examples of some of the action items include the following:

- Implement a more aggressive meter replacement and testing program
- Review site plans for irrigation requirements
- Include meter information (age, rating, etc.) in the Water Accounting Model
- Run more isolation tests in the distribution system
- Supply employee vehicles with portable meters to account for Non-Revenue Water system usage
- Include column on work orders to account for all Non-Revenue Water system usage
- Re-evaluate the fire hydrant maintenance program to account for all Non-Revenue Water
- Locate leaks and run tests
- Hire an outside contractor to sound portions of the Vail system for leaks
- Hire an outside contractor to perform water audits in high-use areas
- Hire temporary employees (especially in the summer) to perform inspections on irrigation systems
- Perform meter reads at the same time each month for production and consumption
- Make sure all sources (production & consumption) are in the Water Accounting Model

Water Rights Dedication Policy

The District has a general policy of conditioning certain water services upon either a dedication of water rights or a payment of cash in lieu of dedication of water rights. This policy applies to all new development or redevelopment within its service area that will require an increase in water use or a new water use not covered by existing taps or zoning, and to all properties not currently within the District's service area. For any redevelopment, this condition applies only to the difference between the projected increased water demand and the pre-redevelopment water demand. The dedication of water rights must provide the District with a dependable legal supply of water equal to one hundred and twenty percent (120%) of the water rights necessary to service the new or increased water demands associated with the new development or redevelopment, or property not previously included in the District's service area. Terms of all water dedication or cash in lieu of water rights agreements or contracts between property owners and the District are at the discretion of the District.

Treated Water Storage Policy

Owners of property upon which new development or redevelopment is proposed, and which will require increased water use or new water use not allowed by existing taps or zoning must provide adequate treated water storage or, at the option of the District, to pay cash in lieu of new treated water storage. The amount of water storage required shall be equal to the combined volumes of water calculated to meet the need for Equalization Storage, Emergency Storage, and Fire Flow Storage for the property.

Water Supply Emergency Planning

The District has developed a Water Supply Emergency Plan; this plan will effectively implement water restrictions using methods such as communication, education, and enforcement. A Water Supply Emergency is triggered by low river flows (i.e., when flows in the Eagle River at the Minturn gage are 18 cfs or less for 72 consecutive hours, or when another extreme situation occurs in the water system). The District's Board of Directors has adopted emergency measures that include prohibition of all lawn irrigation (domestic and commercial); requirements for hand

watering and drip irrigation of shrubs and trees; prohibition of water use for dust control; prohibition of washing hard surfaces and vehicles; prohibition of outdoor ornamental fountains; and request for implementation of strict water conservation measures by area businesses (such as hotels, restaurants and property management companies).

Regular Water Use Violations (see Regulations/Ordinances under Section 6) start with a warning letter, and fines are then implemented for the second, third, and fourth violations. In the event of a Water Supply Emergency, Water Use Regulations will immediately change to the more strict Stage Three Emergency Water Restrictions and be enforced with immediate violation fines instead of a general warning letter. When these supply emergencies occur, the District will notify its customers via water bill inserts, newspaper articles and advertisements, radio broadcasts, signage within the District service areas, and postings on the District's website. Through these means of notification, customers should be aware of when the Water Use Regulations convert to Emergency Water Restrictions. The District will announce the end of any Water Supply Emergency when the emergency passes.

Currently the Water Supply Emergency Plan is not filed with the State, but it was approved by the District's Board of Directors on April 28, 2005. After the Water Conservation Plan is complete, the District plans on updating the Water Supply Emergency Plan and officially filing it with the State.

SECTION 3 – WATER USE AND DEMAND FORECAST

Planning Period

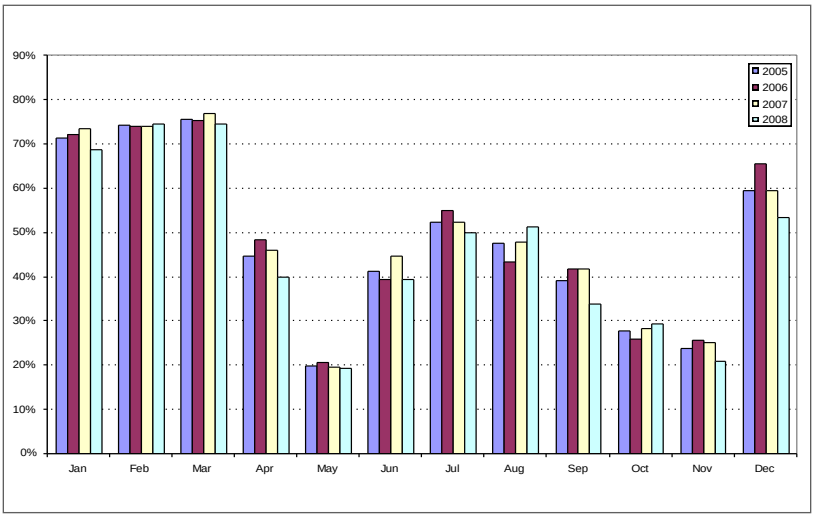
For purposes of assessing the District's conservation efforts and facility needs (see Section 4), a planning period of seven years was chosen, i.e., 2009 to 2015. This timeframe aligns with the CWCB's requirements to update water conservation plans at least every seven years and provides for sufficient time to assess effects of water conservation efforts. Furthermore, several of the water conservation measures and programs contain fixtures such as faucets, showerheads and sprayers that may need to be replaced after approximately five to ten years; therefore, using this time period simplified calculations. In addition, projecting water demands, population, and infrastructure needs as described in the following sections cannot be made with great confidence beyond seven years.

Population Projections

Throughout the 1990s, annual population growth rates that averaged approximately 6% made Eagle County one of the fastest growing counties in the nation. The population growth rate for Eagle County is expected to remain considerably higher than national trends at approximately 3.0% per year until 2015, declining somewhat after that. Though most of the development associated with population growth in Eagle County has taken place in unincorporated areas that are outside of the District's Vail service area, this growth results in additional water demand in Vail. The additional demands on the water supply system occur because large numbers of people come into Vail on a daily basis from the surrounding areas to work, recreate, dine, and shop. For example, on peak days the Vail Ski Area accommodates over 19,000 skiers. It is estimated that over 50% of these skiers come from the Front Range or use accommodations that are not within the Town of Vail.

Determining the population of the District's service area is complicated by the resort nature of the community due to the large number of vacation rental units and second homes, many of which are occupied for only a few weeks or months of the year. Figure 3-4 illustrates the variability in the average monthly occupancy rates for overnight lodging from month to month and between years from 2005 through 2008. The lowest occupancy rates, and thus the lowest population numbers, occur in the off-season months of May, October, and November, between the winter and summer recreational seasons.

Figure 3-4: 2005 to 2008 Monthly Occupancy Rates in Vail



Another important population variable is the large number of second homes in Vail. In Eagle County, the percentage of homes owned by second homeowners was estimated at 46% in 2006, based upon the results of a survey conducted by Northwest Colorado Council of Governments (NWCCOG). Second homeowners spent an average of 64 days per year at their properties (NWCOGG, 2006). Town of Vail estimates indicate that 71% of residential properties in Vail are owned as second homes that are not occupied on a full-time basis; this estimate was based on personal communication with the Town of Vail Housing Coordinator in April 2009. These socioeconomic factors result in large fluctuations in the population served by the District over the course of a year, with peak populations occurring on holidays and weekends during both the summer and winter recreational seasons.

Table 3-5 provides a summary of Vail's potential residential population associated with short term rental units, permanent residents, and second homes based upon historical records for the early to mid-2000s and projections through 2015. Vail's estimated average residential population in 2008 was 15,282, including 5,065 full time residents, 8,042 overnight visitors, and 2,175 second homeowners. The historical population estimates shown in Table 3-6 indicates that the total residential population served by the District is approximately 2.6 to 3 times greater than the full time population of Vail when part-time residents are included. The potential peak population of Vail in 2008 is estimated at 24,587, based upon periods such as holidays when occupancy rates reach 100%. It is important to note that these population figures are based only upon the estimated number of people that are actually residing in Vail for at least one night and do not include people that visit Vail daily from outside areas to work, recreate, dine, and shop. Additionally, these figures include a conservative estimate of second homeowner occupancy because of limited data.

Table 3-5: Eagle River Water & Sanitation District Population Estimates (Vail area only)

Year	Full Time Residents[1]	Total Lodging Bed Base in Vail[2]	Average Annual Lodging Occupancy Rate[3]	Overnight Visitors[4]	Second Home-owners[5]	Potential Peak Population Served by District[6]	Average Population Served by District[7]
2000	4,531	10,878	53.5%	5,814	1,945	17,354	12,290
2001	4,854	11,059	53.5%	5,911	2,084	17,997	12,849
2002	4,844	11,257	46.0%	5,178	2,079	18,180	12,102
2003	4,812	11,446	46.0%	5,265	2,066	18,324	12,143
2004	4,824	11,636	46.0%	5,352	2,071	18,531	12,247
2005	4,789	11,825	48.2%	5,702	2,056	18,670	12,547
2006	4,812	12,015	49.0%	5,891	2,066	18,892	12,769
2007	4,871	12,196	49.3%	6,007	2,091	19,158	12,969
2008	5,065	17,347	46.4%	8,042	2,175	24,587	15,282
2009	5,124	17,981	48.2%	8,670	2,200	25,305	15,994
2010	5,183	19,549	48.2%	9,426	2,225	26,957	16,834
2011	5,242	20,129	48.2%	9,706	2,250	27,621	17,198
2012	5,301	20,733	48.2%	9,997	2,276	28,309	17,573
2013	5,359	21,355	48.2%	10,297	2,301	29,015	17,957
2014	5,418	21,996	48.2%	10,605	2,326	29,740	18,350
2015	5,477	22,655	48.2%	10,924	2,351	30,484	18,752

[1] *Historical Full Time Resident data from Colorado State Demographer. Future data based upon population growth trends from 2000 to 2007.*
[2] *Total Lodging Bed Base in Vail data from Vail Valley Partnership reports and growth trends.*
[3] *Average Annual Lodging Occupancy Rate data from Vail Valley Partnership.*
[4] *Overnight Visitors calculated from Total Bed Base in Vail x Average Annual Lodging Occupancy Rate.*
[5] *Second Homeowner population is based upon 71% of the total full time and second homeowner population assuming that the second homeowners spend an average of 64 days per year in Vail (NWCCOG, 2006). 2007 Example: ((4,871 Full Time Residents x 0.71/0.29) x (64 days/365 days)) = 2,091 Second Homeowners*

Future data based upon growth trends in full time residential population.
[6] *Assuming 100% occupancy, the potential maximum population served by the District represents the sum of Full Time Residents, Total Lodging Bed Base in Vail, and Second Homeowners.*
[7] *Average Population served by the District represents the sum of Full Time Residents, Overnight Visitors, and Second Homeowners.*

Many of the housing, lodging, and commercial buildings in Vail date from the 1960s and 1970s, and major redevelopment efforts are underway that are expected to result in higher density housing and therefore increased indoor water demands. As shown in Table 3–5, there was a decline in the average total population served by the District that started in 2001 and continued through 2006 due the impact of several lodging facilities that were temporarily taken out of service for redevelopment or renovation. The sharp increases in the total bed base shown for 2007 and 2008 were due to the completion of several major redevelopment projects including the Arabelle at Lionshead (50 units), the Vail Plaza (138 units) and several others. Many of the major new redevelopment projects for which completion was originally expected in 2009 and 2010 may be delayed due to current economic conditions and other factors.

In contrast, the full-time residential population of Vail is expected to remain fairly constant. From 2000 through 2008, there were an average of 4,800 full time residents in Vail and from 2009 to 2015 this number is projected to increase to an average of 5,300. The population associated with second home ownership is projected to increase proportionately to the increase in full-time residents. This assumption may be conservative because recent surveys indicate that the percentage of second home ownership has declined in recent years, due in part to an influx of retirees and an increase in affordable employee housing units. Due to the projected growth in overall population and demands, the District is planning expansions and improvements to its water and wastewater treatment systems, as described in Section 4.

Current and Historical Water Use

The following sections describe the total annual water demands in the District's service area and the pattern of monthly demands by account types. It is important to note that the discussions of "water use" and "water savings" throughout the District's Plan refer to total water usage or water diversions rather than "consumptive use." Consumptive uses are generally a small fraction of the total water use because most of the water diverted and used in Vail returns to the stream via the Vail Wastewater Treatment Plant and lawn irrigation return flows.

Total Annual Historical Water Use

Figure 3-5**Figure 3-5** shows the District's total annual water use from 2000 to 2007, including Non-Revenue and Authorized Unbilled amounts. Water use was determined using metered production data, billing data, and estimates of approved unbilled uses and Non-Revenue uses. The District reads water meters and bills customers monthly, unlike many water providers that read and bill on a bimonthly basis. As necessary, the data presented throughout this Plan were adjusted to reflect the actual month of usage.

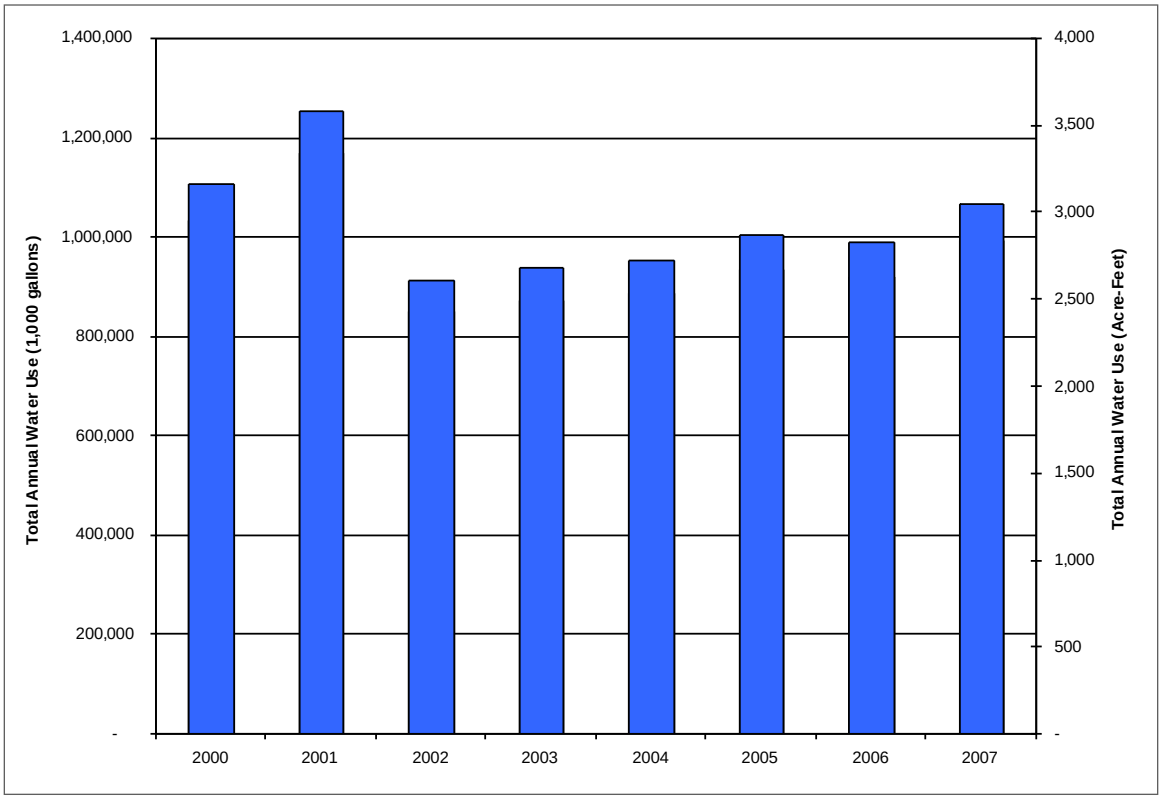


Figure 3-5: Total Annual Historical Water Use (2000 to 2007)
(Includes Authorized Unbilled and Non-Revenue Water)

The effects of the extreme drought that occurred in 2002, as well as reduced water demands associated with major redevelopment efforts underway in the Town of Vail, can be seen in decreases in total use since 2002 compared to 2000 and 2001. In 2003, several major hotels and other commercial establishments were taken out of service or began operating at reduced capacities while older facilities were replaced or updated. Many of these establishments are now coming back online and the District anticipates increases in water use as planned improvements are completed over the next several years, as indicated by the increased total annual water use numbers in 2007 as compared to previous years. The average annual water use from 2000 to 2007 was 958 MG, or approximately 2,941 AF.

Historical Water Use by Account Type

The District's service area consists predominately of Residential, Commercial, and Mixed use accounts, which utilize about 70% of all of the water produced by the water supply system, as shown in Figure 3-6. (A detailed description of account types is included in Section 2 of the Plan). Commercial and Mixed Use accounts used 22.9% and 10.6%, respectively, of the total average annual water use from 2000 through 2007, while Residential accounts used 35.8% of the total. Sprinkler and Irrigation accounts used 2.4% and 2.9%, respectively, while Authorized Unbilled uses were 1.5% and Non-Revenue uses were 23.8% of the average annual 2000 through 2007 total. Hydrant Meter use comprises a small amount, approximately 0.1%, of overall total usage.

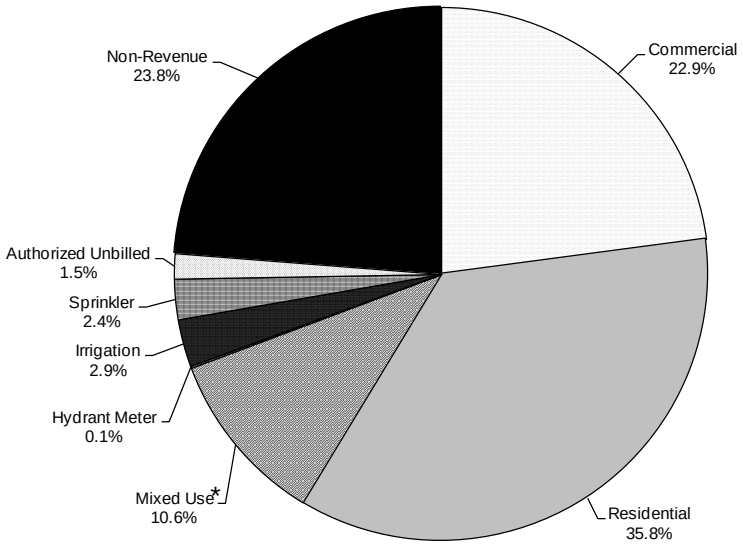


Figure 3-6: Average Annual 2000 to 2007 Percentage of Total Water Use by Account Type and Authorized Unbilled and Non-Revenue Water

*It is likely that a number of Mixed Use accounts are included in the Commercial account type. The District is working on this issue through its Uniformity Project.

An annual breakdown of water usage by account type is presented in Figure 3-6 for the 2000 through 2007 period, and Figure 3-7**Figure 3-7** shows total monthly water use for Residential, Commercial, Mixed Use, Sprinkler, and Irrigation accounts for the 2000 through 2007 period. Water use has been fairly consistent during this period for all account types, although it was lower during the summer months of 2004 as a result of unusually wet weather. As is typical, peak water use occurs during the summer months for each account type due to outdoor water uses.

Table 3-6: Historical Annual Water Use by Account Type, Authorized Unbilled and Non-Revenue Water (AF)

Year	Residential	Commercial	Mixed Use	Hydrant Meters	Irrigation	Sprinkler	Authorized Unbilled	Non-Revenue Water
2000	1,201	746	338	-	92	79	-	715[1]
2001	1,186	724	341	-	104	86	59	1,087
2002	1,075	677	303	-	90	70	47	349
2003	998	653	304	3	77	64	44	542
2004	965	621	298	7	79	66	71	616
2005	989	642	288	6	80	66	22	777
2006	1,002	670	305	5	84	66	61	638
2007	999	654	321	8	70	78	55	864
Avg	1,052	673	312	4	84	72	45	699
% of Total Avg	35.8%	22.9%	10.6%	0.1%	2.9%	2.4%	1.5%	23.8%

[1] Authorized Unbilled and Non-Revenue values were not recorded separately in 2000.

The patterns illustrated in Figure 3-7 also exhibit a secondary demand peak in the winter months typical of ski resort communities for Residential, Commercial, and Mixed Use accounts due to increased demands from winter visitors. This secondary peak is not typical of many communities, such as on the Front Range, which have only a summer peak. As described above, the lowest water demands occur in the spring and fall seasons – between the summer irrigation and tourism season and the winter ski season – with lowest demands typically occurring in May.

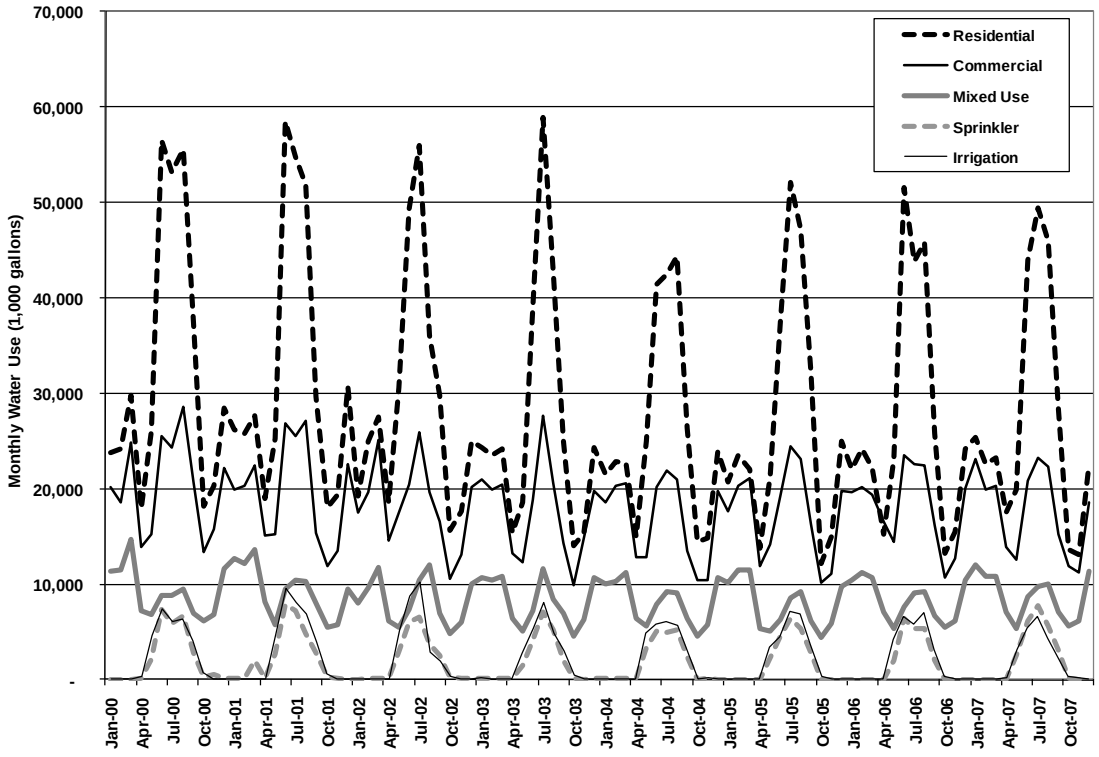


Figure 3-7: Monthly Water Use 2000 through 2007 by Account Type

Authorized Unbilled water uses average 1.5% of the District's total water usage. Authorized Unbilled uses peak in the summer months due to increased fire department water usage for fire suppression and training, main line flushing, and other uses that typically do not occur during the winter but can be accounted for.

Figure 3-8 shows the 12-month rolling average of Non-Revenue Water use for the Vail water system for the period 1996 through 2007. Non-Revenue Water is any water lost or used in the distribution system that cannot be accounted for through either direct measurement or estimation. The primary factors resulting in non-revenue water are metering inaccuracy, unauthorized unmetered usage, and distribution system leakage. As described in Section 6, the establishment of the Non-Revenue Water Committee has assisted in coordinating and monitoring the District's efforts to reduce Non-Revenue Water in the District and UERWA water distribution systems. In 2005, the District conducted a detailed audit using modern accounting standards and procedures to more accurately determine the amount of Non-Revenue Water use in the distribution system. This effort included the development of a sophisticated accounting program, procedures for data management and interpretation, loss reduction programs, and organizational strategies for program implementation and management.

Careful and accurate measurement of all water usage is necessary to improve the accuracy of estimates of Non-Revenue Water and develop water loss management strategies. Since 1996, to improve measurement accuracy, the District has replaced 71% of the commercial and residential water meters and installed radio-read devices on 100% of the meters in Vail. The radio-read devices enable the District to read all of the meters in a very short timeframe. Historically, a period of several days was required to manually read all of the meters, making it difficult to accurately correlate the accounting periods for water production with water consumption.

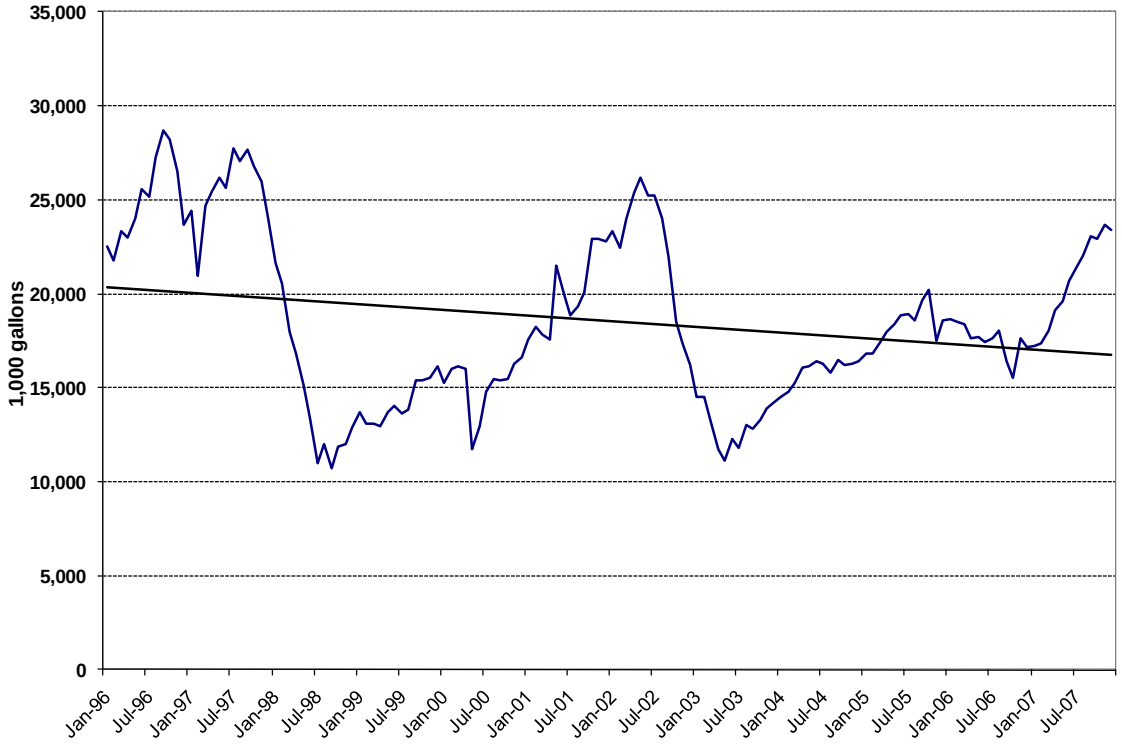


Figure 3-8: 12-month Rolling Average of Non-Revenue Water for 1996 through 2007

Figure 3-8 illustrates the variability of monthly Non-Revenue Water in the District's treated water delivery system over the last 12 years. During this period, monthly Non-Revenue Water use has

been highly variable, averaging about 23.8% of water production in recent years. Overall, there appears to be a gradual decline in Non-Revenue Water use and since the beginning of 2003, a narrowing of the range of variability, likely in response to the District's Non-Revenue Water program activities. The large reduction in the 12-month rolling average Non-Revenue Water use after 2002 is due primarily to the combined results of leak detection efforts and improvements in data collection and accounting procedures. During the last few years, the 12-month rolling average is again increasing, possibly due to additional system leaks that have not been located and repaired.

The District's relatively high percentage of Non-Revenue Water use is most likely largely due to unavoidable annual real losses associated with the age of the system, line length, and system pressure variables. The system is highly dispersed with an average of only 20 connections per mile of distribution system pipeline, and service meters are typically located in basements adding 100 to 125 feet of line per connection before water is metered (HDR, 2006). The system includes 11 pressure zones and thus maintains unusually high system pressures averaging 100 to 130 pounds per square inch (psi) within each zone to address significant service elevation differentials. The length of service lines in the distribution system creates greater exposure for leaks and the high system pressures increase leakage rates. The 2005 audit of the District's system conducted by HDR found that while the system loss and Non-Revenue Water percentage appear to be high, it is not unexpected due to these factors. Nonetheless, the District has identified the reduction of Non-Revenue Water use as a high priority water conservation goal.

Water Consumption Analysis

The population of the District's service area, as described above in Section 2, is constantly fluctuating due to the resort nature of the community, with its large number of lodging, vacation rental units, second homes, and the daily influx of workers, skiers, and other visitors. The data needed to accurately determine the number of people in Vail at any given time is not available, but a large portion of the average residential population of Vail (individuals that spend at least one night) can be estimated based upon census data, occupancy data for short-term lodging, and survey data on frequency of use of second homes. Based upon the estimate of the average population served by the District, as summarized above in Figure 3-5, and total system usage, which includes Authorized Unbilled and Non-Revenue Water, the District's water consumption has averaged 210 gallons per capita per day (gpcd) over the 2000 through 2007 period, as shown in Table 3-7. Per capita usage through this period varied from 193 gpcd in 2002, an extremely dry year, to 249 gpcd in 2001.

The gpcd values presented in Table 3-7 are not comparable to other communities because the influx of daily visitors to Vail often results in an actual population served by the District that is proportionally much higher than for non-resort communities. This impact is difficult to quantify because it is highly variable and comprehensive data is not currently available. In addition to the daily population influx factors, it is also important to consider that second homeowners (approximately 71% of the residential properties in Vail) that are not present throughout the entire summer irrigation season are still using water for outdoor irrigation purposes. Property managers and landscape companies are often hired to tend to landscaping and irrigation through the summer whether the homeowner is present or not.

Due to the daily population influx and non-resident second home factors described above, the commonly used gpcd water consumption metric is not the best indicator of water use efficiency for resort communities like Vail and should not be compared to other communities. However, recognizing that no two communities are exactly alike, the District will continue to track gpcd usage in its service area for the purpose of identifying water usage trends within Vail. In addition, the District will continue to support the ongoing efforts of the NWCCOG, Eagle County, and the Town of Vail to monitor population and socioeconomic trends and develop more detailed economic and population data needed to better understand water usage.

Table 3-7: Historical Gallons Per Capita per Day Water Use Estimates

Year	Average Population Served by District	Total Water Demand (1,000 gallons)	Total Water Demand (AF)	GPCD (using Total Water Demand) [1]	Total Billed Water Demand (1,000 gallons) [2]	GPCD (using Total Billed Water Demand) [1]
2000	12,290	1,033,611	3,172	230	800,487	178
2001	12,849	1,169,085	3,588	249	795,743	170
2002	12,102	850,716	2,611	193	721,837	163
2003	12,143	874,441	2,684	197	683,802	154
2004	12,247	887,453	2,723	199	663,499	148
2005	12,547	934,905	2,869	204	674,582	147
2006	12,769	922,707	2,832	198	694,770	149
2007	12,969	993,268	3,048	210	693,810	147
Average	12,489	958,273	2,941	210*	716,066	157*

[1] Calculation is based only upon Average Population served by the District (sum of Full Time Residents, Overnight Visitors, and Second Homeowners). GPCD values do not include day visitors or employees that reside outside the Town of Vail.
[2] Total Billed Water Demand does not include Non-Revenue or Authorized Unbilled Water.

As previously discussed in Section 2, the District assigns an SFE value to Residential, Commercial, and Mixed Use customer accounts. Historically, the District has used water consumption per SFE to monitor consumption trends and develop estimates of future water demands associated with projected population growth in its service area. The District's water demand forecasts based upon this method have proven to be reliable. Table 3-8 includes the average annual consumption per SFE for 2000 through 2007. One advantage of the use of the SFE method is that good historical data are available, and this approach can be easily replicated in the future.

Table 3-8: Historical Gallons per SFE Water Use Estimates

Year	SFEs[1]	Total Water Demand (1,000 gallons)	Gallons/ SFE
2000	8,711	1,033,611	118,656
2001	8,723	1,169,085	134,031
2002	8,761	850,716	97,108
2003	8,813	874,441	99,222
2004	8,798	887,453	100,870
2005	8,757	934,905	106,761
2006	8,900	922,707	103,675
2007	9,076	993,268	109,439
Average	8,817	958,273	108,720

[1] 2000 to 2007 SFE data from District Billing Department

Demand Forecasting Method

The Vail Water System Master Plan Update completed in August 2008 by SGM evaluated historical and projected (through 2012) development and water demands and water system improvements required to meet the future projected needs. This Master Plan updated the 2002 Vail Water System Master Plan in response to ongoing redevelopment in the core areas of Vail (e.g., West Vail, Lionshead, Vail Village, etc.). While the District initiated the Master Plan Update and this Water Conservation Plan simultaneously, they were completed at different times. Although it is not expected that water conservation efforts undertaken as a result of this Plan will have significant bearing on infrastructure improvements in the near future, their updates should be completed in tandem in the future in order to identify the most complete package of planning options for the District.

For purposes of this Plan, the Master Plan update demand projections were not used because they represent the worst-case scenario or what infrastructure would need to be built or improved

if there were a heavy influx of additional people placing demands on the system. Rather, a more conservative, financial planning approach as described below was used. Nonetheless, the Master Plan Update should be referred to for additional information regarding water production, water storage, water transmission and distribution, and alternatives to meet future demands.

As mentioned above, to project future water demands due to population growth in its service area, the District monitors consumption trends using historical water usage per SFE. This method is reliable and can be replicated in the future due to the availability of sound historical data. The District receives biannual cash flow forecasts from Stan Bernstein and Associates, Inc. for the Vail Water Sub-District. These financial forecasts include SFE growth projections, water user fee revenues and water tap fee rates and revenues. Projected demands are determined using historical SFEs and consumption trends. The actual historical total SFEs and total demands on the system from 2005 to 2007 were used to calculate an average total demand per SFE. Using SFEs as projected by Bernstein, estimated total demands were calculated, as presented below in Table 3-9. These demands were developed to compare the effectiveness of water conservation programs by tracking the reduced consumption rates per SFE (Goal 2 in Section 5).

Demand Forecast

Table 3-9 shows total future water demands for the District's system in the absence of additional water conservation measures or programs. By 2015, demands are predicted to increase by a total of 526 AF over 2008 levels. It is important to note that the 2008 total projected water demand of 2,981 AF is less than the 2007 total demand number of 3,048 AF (Table 3-7) due to expected decreases in total water usage system-wide. Additionally, the 2009 anticipated total demand of 3,079 AF is only a slight increase over the 2007 total demand.

Table 3-9: Actual and Projected Total Water Demands

Year	Actual and Projected SFEs[1]	Actual Total Water Demand (AF)	Actual Total Water Demand (AF/SFE)[2]	Projected Total Water Demand (AF)[3]
2005	8,757	2,869	0.3276	--
2006	8,900	2,832	0.3182	--
2007	9,076	3,048	0.3359	--
2008	9,109	--	--	2,981
2009	9,410	--	--	3,079
2010	9,518	--	--	3,114
2011	9,658	--	--	3,160
2012	9,858	--	--	3,226
2013	10,185	--	--	3,333
2014	10,465	--	--	3,424
2015	10,719	--	--	3,507
Average			0.3272	

[1] 2005 to 2007 Actual SFE data from District Billing Department. 2008 to 2015 Projected SFE data from Bernstein and Associates, Inc.
[2] Actual Total Water Demand (AF/SFE) = Actual Total Water Demand (AF)/Actual SFEs
[3] Projected Total Water Demand (AF) = Projected SFEs x 0.3272 AF/SFE

SECTION 4 – PROPOSED FACILITIES

Identify and Cost Potential Facility Needs

Water Treatment System

The District is planning a number of projects to increase the capacity of the water treatment system to meet projected future demands. These projects include improving sources of supply, constructing a new water treatment facility, and providing for additional treated water storage as described in Table 4-10.

Table 4-10: Anticipated Improvements and Additions to Water Treatment System

Project Description	Improvement/ New Capacity*	Timeframe		Type of Project	Anticipated Cost
		Start	End		
Source of Supply					
Eagle Park Reservoir Enlargement	Improvement/ New Capacity	2008	2008	Capital Improvement	$39,524
Black Lakes Enlargement	Improvement/ New Capacity	2008	2009	Capital Improvement	$811,945
Black Lakes Spillway Repairs	Improvement	2009	2009	Life Cycle Replacement	$145,000
R1 Well Production Increase	Improvement/ New Capacity	2009	2009	Capital Improvement	$2,155,000
Water Treatment Facilities					
Ground Water Rule Improvements	Improvement	2009	2009	Capital Improvement	$1,520,879
Gore Valley Drinking Water Facility Membrane Replacement	Improvement/ New Capacity	2009	2009	Life Cycle Replacement	$125,000
3 MGD Drinking Water Treatment Facility	Improvement/ New Capacity	2012	2013	Capital Improvement	$13,500,000
Treated Water Storage					
2 MGD Treated Water Storage Tank: Vail Core	Improvement/ New Capacity	2010	2011	Capital Improvement	$4,900,000
Major Transmission Lines					
Plumbing modifications to optimize treated water supply (from wells) to the system	Improvement	2009	2009	Capital Improvement	$350,000

*New Capacity may include increased storage and/or additional production capabilities.

Wastewater Treatment System

With increased demands, the District's wastewater treatment system, which also serves the UERWA area, will also require upgrades, as evidenced by the list of planned improvements in Table 4-11. The District expects to be planning an expansion of the Avon wastewater treatment facility in 2012 when the current facility is expected to reach 80% of its design capacity. Evaluation of the sewer mains between Vail and Avon will occur in the near future. After the first study, upsizing evaluations will also be completed to ensure capacity needs. Flow capacity and solids handling will also be addressed in the next 3 to 5 years.

Table 4-11: Anticipated Improvements and Additions to Wastewater Treatment System

Project Description	Improvement/ New Capacity*	Timeframe		Type of Project	Anticipated Cost
		Start	End		
Biosolids					
Edwards WWTP: Conversion to New Generation ATAD	Improvement	2009	2010	Capital Improvement	$9,000,000
Avon WWTP: Conversion to New Generation ATAD	Improvement	2009	2011	Capital Improvement	$8,600,000
Equipment Replacements					
Avon WWTP: Clarifier mechanisms	Improvement/ New Capacity	2009	2010	Life Cycle Replacement/ Capital Improvement	$3,200,000
Capacity					
Avon WWTP: New clarifier, biological treatment, and increased hydraulic capacity	Improvement/ New Capacity	2012	2015	Capital Improvement	$12,000,000
Vail WWTP: New clarifier	Improvement/ New Capacity	2012	2015	Capital Improvement	$3,000,000
System Optimization					
Vail WWTP: Blower and electrical improvements	Improvement	2009	2010	Life Cycle Replacement	$883,780
Avon WWTP: New diffusers for aeration	Improvement	2009	2010	Life Cycle Replacement	$400,000
Improvements					
Avon WWTP: New bar screen for screening redundancy	Improvement/ New Capacity	2008	2008	Capital Improvement	$250,000
Avon WWTP: Blower automation, aeration treatment improvements, and electrical savings	Improvement	2008	2008	Capital Improvement	$499,992
Vail WWTP: Grit system replacement	Improvement	2008	2008	Life Cycle Replacement	$150,000
Vail WWTP: New generator to allow for increased capacity	Improvement	2010	2011	Capital Improvement	$580,000
Vail WWTP: Install redundant bar screen	Improvement	2011	2011	Capital Improvement	$350,000
Edwards WWTP: Additional third screw pump	Improvement	2011	2011	Capital Improvement	$1,500,000

*New Capacity may include increased storage and/or additional production capabilities.

The Capital Improvement costs are funded by revenue bonds. Projects considered Life Cycle Replacement Projects are funded by service fees and operating revenue.

The Master Plan Update also addressed infrastructure capital improvements over the next five or more years within the District's service area. It was developed to help guide the District strategically meet future demands through infrastructure and facility improvements and demand management. Detailed information regarding water supply alternatives and the facilities that would be required for each are presented in the Master Plan Update. Although it calls for upgrades and modifications to existing infrastructure, any suggested system modifications are in a conceptual stage and would therefore require significant additional study prior to the District adopting them.

Supply Capacity

The District's water rights are sufficient under State law to divert all water supplies necessary to fulfill its service function to its current population. Future increases to the service area or increasing population density within the service area could require additional water supplies. In particular, service to the Wolcott service area may require the purchase and/or dedication of additional water rights by developers.

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SECTION 5 – CONSERVATION GOALS

Water Conservation Goals

The District's overall programmatic water conservation goal is to minimize waste and encourage efficient use of water resources. All water used in the District's service area originates from Gore Creek or the Eagle River, therefore water use in Vail is linked directly to biological and recreational resources that are important to the area's recreational and tourism-based economy. The fundamental resource conservation principles underlying the District's water management and conservation goals are driven by the need to protect streamflows and water quality in Gore Creek and the Eagle River. High water demands during late summer, fall and winter in the District's service area coincide with periods when stream flows are at their lowest. Efficient utilization of water through implementation of the programs and measures identified in this Plan is an important component of the District's goal of maintaining and enhancing streamflows.

Though the District has sufficient water rights to reliably meet anticipated near-term water demands in the Vail area based on historic hydrology, it is continuing to develop and refine plans for the water supply, storage, treatment, and distribution facilities that will be needed in the future especially in the Wolcott area. The effectiveness of water conservation measures will be an important factor in determining the timing, sizing, and potential need for future facilities. An important programmatic goal will be to coordinate and integrate the development of the District's Water Conservation Plan with ongoing facilities planning. Conservation will be an element of the District's strategy for responding to demand side uncertainties associated with changing land use patterns (e.g., increased development density) and supply side uncertainty resulting from factors such as climate change. The District's programmatic water conservation goals are listed below.

1. Continue to identify and reduce Non-Revenue Water.
2. Continue trend of reduced consumption rate per SFE.
3. Demand reduction of 12% by 2015.
4. Increase emphasis on conservation efforts in the hotel/commercial water use sectors.
5. Increase community education and regulation to reduce over-irrigation.
6. Develop and implement a monitoring and accounting system that allows for effective measurement of water savings associated with conservation measures and programs.
7. Continue existing water conservation activities that have proven effective and have been accepted by the community.
8. Select and implement new conservation measures and programs based upon their water savings potential, cost effectiveness and consistency with community values.

To gauge the success of a water conservation plan, attainable goals have been identified to serve as benchmarks for evaluating the effectiveness of the plan by providing targeted amounts of water savings for conservation measures and programs. Based upon the evaluation of individual conservation measures described in Section 7, it is estimated that the Plan will result in a total annual savings of nearly 420 AF by 2015 and a cumulative savings of 2475 AF over the 7-year term of the Plan. These goals may evolve over time as new and improved ways to conserve water are identified.

Goal Development Process

Historical water use and forecasted demands were analyzed to identify areas where water conservation activities might have the greatest impact or would increase water use efficiency for the District. Input on proposed goals was solicited from the District Board members, staff, consultants, targeted community groups, and the general public. Goals were also revisited after conservation measures and programs were selected for implementation. Goals 1, 2, and 3 target

more quantitative-based water savings goals, whereas Goals 4 through 8 focus on the qualitative aspects of the selected measures and programs discussed in Section 7 and their implementation. The District recognizes the importance of developing methods to reduce the Non-Revenue Water component of its system, which averages approximately 23.8%. According to various AWWA documents, the industry average for Non-Revenue Water is approximately 17%. A 2005 audit of the District's system conducted by HDR found that while the system loss and Non-Revenue Water percentage appear to be high, it is not unexpected due to factors including the age of the water distribution system, line length, and high system pressures. Nonetheless, the District has identified the reduction of Non-Revenue Water use as a high priority water conservation goal. The District will continue to work diligently on tracking Non-Revenue Water and finding ways to improve upon the current percentage of total use that it comprises through its NRWC, enhancement of water accounting programs, leak detection, and organizational policies for Non-Revenue Water reduction program execution and administration.

As shown in Figure 5-9, recent trends indicate that the amount of water sales and wastewater influent are decreasing while the District's water production is holding fairly steady, all during a steady growth in SFEs. The District has identified a goal of continuing this trend into the future which highlights reduced consumption per SFE or population served. As presented in Section 7, if the conservation measures and programs are implemented as described in this Plan, a savings of nearly 12% can be expected by 2015.

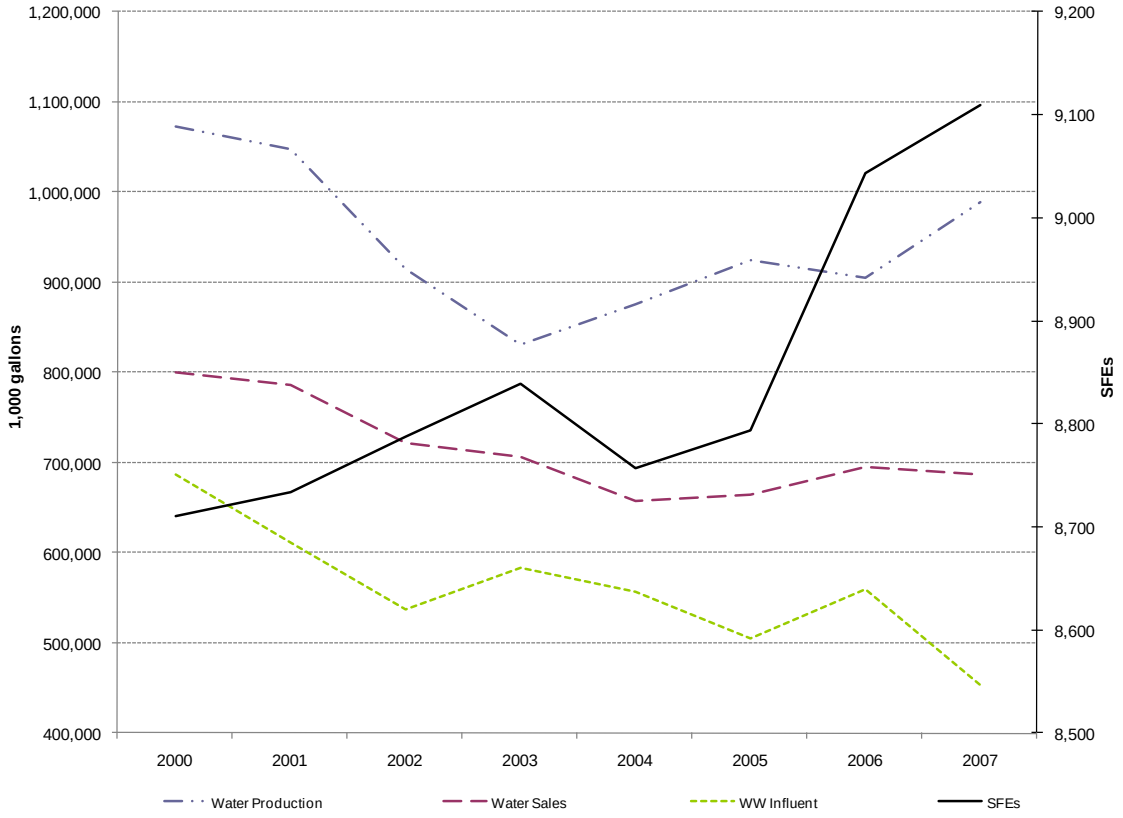

Figure 5-9: Historical Water Production, Water Sales, Wastewater Influent and SFEs

SECTION 6 – CONSERVATION MEASURES AND PROGRAMS

Current Water Conservation Activities

Since the adoption of the District's first Water Conservation Plan in 1990, the overall programmatic goal has been to minimize waste and encourage efficient utilization of water resources. The program emphasis has been focused primarily on public education, metering, water use regulations, and leak detection measures. The District's predecessor, Vail Valley Consolidated Water District, initiated many of these measures before the 1996 formation of the District. A summary of current conservation activities through 2008 is provided in Table 6-12. In some cases, water savings calculations for current programs were performed differently compared to water savings for potential programs discussed later in the Plan due to availability of data. The detailed calculations of water savings attributed to the current programs shown in Table 6-12 are presented in Appendix A. It is important to note that the estimates of water savings shown in Table 6-12 are based upon total water usage rather than consumptive use. Generally, for indoor domestic water use, only about 5% of the total usage is actually consumed.

Table 6-12: Summary of Conservation Activities through 2008

Water Conservation Measures and Programs[1]	Start date	Total water savings since program inception (1,000 gallons) through 2008	Is continued (or renewed) implementation planned?
Water Efficient Fixtures/Appliances and Incentives			
Free Indoor Water Conservation Kits	1994	54,448	Yes
New and Retrofit Fixture Incentives: Commercial	2008	215	Yes
Indoor Fixture Retrofitting at District Facilities	1997	3,041	One-time program that continues to provide water savings
Landscape Efficiency			
District Waterwise Landscaping and Demonstration Gardens	2005	Unknown	Yes
Support and Promote Low Water Use Landscaping at Public Facilities (Commercial and Industrial Water Conservation Education and Support)	2003	Unknown	Yes
Landscape and Irrigation Audit Program	2006	Advanced: 1,054 Basic: 1,986	Yes
Certification Programs and Classes for Irrigation Professionals	1994	Unknown	Yes
Industrial and Commercial Efficiency			
Signage and Programs to Encourage Water Conservation by Guests at Hotels, Rental Properties and Restaurants (Tourist Industry)	2004	1,386	Yes
Lodging Sector Voluntary Conservation Programs	2004	5,727	Yes
Education/Information Distribution			
Community Education (Public Education)	1994	Unknown	Yes
District Employee Education (Public Education)	2004	Unknown	Yes
Efficient Irrigation & Waterwise Landscaping Seminars for the Public (Public Education)	1994	Unknown	Yes

Water Conservation Measures and Programs[1]	Start date	Total water savings since program inception (1,000 gallons) through 2008	Is continued (or renewed) implementation planned?
Youth Education (Youth and Teacher Education)	1991 2006 (Living Wise)	1,419[2]	Yes
Irrigation and Waterwise Landscaping Educational Materials (Public Education)	1994	Unknown	Yes
Indoor Water Audits	2008	Unknown	Yes
Water Conservation Webpage	2003	Unknown	Yes
Encouraging Water Conservation through Water Rate Structures and Billing			
Inclining Tiered Water Rate Structure (Water Rate Structure)	2003	Unknown	Yes
2008 Billing System Upgrade	2008	Unknown	Yes
Billing Message Blocks/Inserts	1996	Unknown	Yes
Voluntary Separate Metering (Water Rate Structure)	~1964	Unknown	Yes
Meter and Pay for Construction Water Use (Water Rate Structure)	~1964	Unknown	Yes
Regulations/Ordinances			
District Water Use Regulations	1995	Unknown	Yes
Collaboration with Other Entities to Encourage Green Building and Water Efficient Practices (Collaborate with Land Use/Governmental Agencies)	2003	Unknown	Yes
Other Water Management Activities			
Water Conservation Officer Staff Position	1995	Unknown	Yes
Water Reuse/Raw Water Systems			
Indirect Use of Effluent Return Flows (for Vail snowmaking)	1995	456,191	Yes
Water and Wastewater Treatment Plant Efficiency (Treatment Facility Water Conservation/ Efficiency Opportunities)	1996	11,984	Yes
Conversion to Raw Water Supply for Parks and Open Spaces	1998	Unknown	No
Distribution System Efficiency			
System Maintenance, Leak Detection and Repair	1992	34,061[2]	Yes
Non-Revenue Water Committee	2004	Unknown	Yes
Free High Use Water Audits/Individual Account Leak Detection (Customer Service)	2003	4,156[2]	Yes

[1]General assumptions and calculations used in estimating water savings for current measures and programs are provided in Appendix A.

[2]Not all programs have water savings data available beginning with the first year of implementation. Water savings were calculated based on the number of years with reliable data, (i.e., no data were used to calculate savings from previous years where savings data were unavailable).

Below is a more detailed description of current and previously implemented program measures that continue to provide water use savings for the District. Note that though some existing conservation activities could be listed under more than one category, they are included under the heading that most closely describes the type of activity. Additionally, the budgets for measures and programs that have budgets do not include staff time or marketing costs.

Water-Efficient Fixtures/Appliances and Incentives

The passage of the Federal 1992 Energy Efficiency Law set maximum water use standards for toilets and showerheads. All new developments are built with water efficient fixtures and appliances, and many older buildings have been retrofitted, leading to indoor water use savings.

Free Indoor Water Conservation Kits

Since 1994, the District has provided conservation kits at no cost for pick-up by its customers at the Vail office. Kits include high-efficiency aerators for sinks, high-efficiency showerheads, shower timers, toilet flapper valves, tank bags, toilet leak detection tabs, and educational materials. Toilet leaks can account for hundreds of gallons of wasted water a day and are often caused by deteriorated flapper valves. The District works with its customers to make them aware of this issue and offers free replacement flapper valves (which should be replaced every 5 years) to help keep toilets working properly. These kits have consistently been updated as more efficient fixtures become available. An estimated 1,700 kits have been provided since 1994 between the District and the UERWA. Items from the conservation kits are also given out during school tours and special events and shows such as BizTech.

The District plans to continue this successful program annually in the future, using a budget of $2,000 per year plus staff time and marketing costs to provide approximately 139 kits to interested households. The kits are currently designed so that each customer can build their own conservation kit in an attempt to improve instances of installation by taking only what they need or will likely install.

New and Retrofit Fixture Incentives: Commercial

Incentives for commercial property owners to install or retrofit their fixtures have fallen under the free indoor water conservation kit program in the past. However, in 2008, the District created a separate fixture incentive program for Commercial accounts to more easily track the program's effectiveness and encourage larger water users to take advantage of this opportunity. The District has recently encouraged various local hotels to install a number of toilet flappers, bathroom aerators, kitchen aerators, showerheads, and use dye tablets for their leak detection programs. The District offers commercial property owners and residential HOA's up to 50 of each item in the free conservation kit to start programs. If more items are needed, each property owner can work with the District if there is interest in placing a bulk order for additional items at the District's cost.

The District plans to continue this successful program in the future using a budget of $1,500 per year plus staff time and marketing costs to provide approximately three sets of the free conservation kits. Each set would provide 50 of each of the five efficient fixtures (bathroom aerators, kitchen aerators, showerheads, flapper valves, and tank banks), which could then be installed by commercial entities.

Indoor Fixture Retrofitting at District Facilities

Many District-owned properties have been retrofitted to showcase conservation techniques. At the Vail WWTP and the Avon Drinking Water Facility, low flow toilets (1.6 gallons per flush (gpf)), urinals (1.0 gpf), high efficiency bathroom and kitchen sink aerators (1.0 gallons per minute (gpm)), and high efficiency showerheads (1.5 gpm) have been installed or are currently being installed. The Edwards Waste Water Facility, built in 1980, and Drinking Water Facility, built in 2001, were retrofitted and built, respectively, with all high efficiency fixtures. Since 1997, approximately 21 sinks, 15 toilets, 7 urinals, and 5 showers have been retrofitted in the District's older facilities.

Although the initial retrofit is completed, the District will continue this program by updating fixtures as necessary. In addition, any new facility will have water efficient indoor and outdoor fixtures installed.

Landscape Efficiency

District Waterwise Landscaping and Demonstration Gardens

In 1995 the District began replacing over 11,000 square feet of traditionally landscaped areas and updating irrigation systems at some of its facilities. A Waterwise landscaping demonstration garden was installed at the Vail WWTP. Additionally, in the summer of 2006 the District held a Waterwise demonstration garden tour that led people all over the valley to see different Waterwise landscaping designs. The garden at the Vail Wastewater Treatment Plant was the first garden on the tour.

Support and Promote Low Water Use Landscaping at Public Facilities (revised program name: Commercial and Industrial Water Conservation Education and Support)

The District partners with Eagle County and local government entities to encourage water efficient landscaping and irrigation. The District has worked with Eagle County by assisting with preliminary planning processes for a Waterwise landscape demonstration garden outside the main Eagle County buildings. The first section of the garden was completed in the summer of 2008. The District worked with the Town of Vail to create a 2,082 square foot Waterwise landscape demonstration garden in Donovan Park. The Town has funded the demonstration garden and the District will contribute money for interpretative signs. Within the next few years, the Town of Vail is planning to add an additional 2,000 square feet of Waterwise landscaping at the park by removing turf areas in the parking lot medians.

The District will continue to participate in efforts to promote the Commercial and Industrial Water Conservation Education and Support program, taking some ideas from the "Collaboration with Other Entities to Encourage Green Building and Water Efficient Practices" program described below to incorporate more support for overall water conservation practices. For example, encouraging the use of water efficient fixtures and appliances, offering assistance by providing audits and leak detection, and collaboration with schools and municipalities to identify water-saving opportunities will be included in this Commercial and Industrial Water Conservation Education and Support program in the future.

Landscape and Irrigation Audit Program

In 2006, the District received a grant from the Colorado River Water Conservation District for an Irrigation Audit Efficiency Program to promote reduced irrigation water usage. The District partnered with an irrigation contractor to provide water audits and training for commercial and residential customers. Customers could request audits, and customers with the highest water use (water use in Tier 3 of the District's rate structure) were contacted directly. Two types of audits, basic and advanced, were completed. A basic audit consisted of a site inspection and system tune-up, such as looking for broken sprinkler heads, overspray, or mixed sprinkler heads in the same zone. An advanced audit consisted of a "catch-can" test where containers were set up randomly beneath the spray pattern of one zone. The depth of water collected over an interval of time was determined and these data were used to calculate a watering schedule based on the system's actual efficiency and water distribution. Results from the program are as follows:

> Basic audits: 125 sprinkler zones (small irrigation areas at a property) were audited, resulting in an annual average savings of 10,594 gallons per zone
>
> Advanced audits: 38 sprinkler zones were audited, resulting in an annual average annual savings of 18,495 gallons per zone

This program was a great success, and many additional customers have expressed an interest in being audited. To further the education of contractors and spread efficient irrigation knowledge throughout the area, the District will continue to annually hold certification courses in the area for contractors to earn their education credits and maintain certification with the Irrigation Association. This will certify additional contractors that the District will work with when this program is re-implemented in the future.

Once the program restarts, $2,000 plus staff time and marketing costs will be allocated which will target 40 sprinkler zones each year for auditing. As long as the program is successful the District will continue implementing it each year.

Efficient Irrigation and Waterwise Landscaping Seminars for the Public (revised program name: Public Education)

Since 1994, the District has sponsored public seminars on water conservation and water efficient landscaping, frequently collaborating with other entities including the Betty Ford Alpine Gardens, Eagle Valley Libraries, and the Colorado State University Extension Office.

From 1996 through 2003, the District partnered with the Vail Alpine Garden Foundation Seminar Series, which focused on landscaping education for school children and adults.

In 2004, the District, the Colorado State University Extension Office, and the Eagle Valley Libraries began working together for the Mountain Adapted Landscape Series. Classes start in April and run through May of each year. From 2004 through 2007, 29 classes were held with an average of 24 attendees for a total of 684 participants. In 2008, four classes were held: Introduction to Mountain Gardening (27 attendees), Roses for Mountain Communities (24 attendees), Do's and Don'ts for your Lawn in the Vail Valley (28 attendees), and Using Technology to Improve Landscapes and Save Water (21 attendees). The three hands-on Container Classes/Workshops held in 2008 also had significant attendance.

In 2006, the Betty Ford Alpine Garden started a self-guided audio tour program called the "Backpack Program." Visitors to the garden can utilize the available materials for self-led audio tours. Visitors can bring groups to the garden, check out the backpacks, and lead the group through the tour themselves. The backpacks are loaded with different lessons and tools, like journals and drawing materials, to assist with learning on the tour. Children can keep some of the material that they worked on, but the Garden retains the tools and audio sets. The District has helped design and fund a backpack focused specifically on conserving water while gardening. One thousand dollars was donated by the District in 2007 for 1 backpack that contained 10 sets of tools. The money also helped purchase materials that need to be replenished after every tour.

Public Education programs will continue to be implemented year round by the District. At least $500 plus staff time and marketing costs will be allocated to these programs annually. This program will be combined with the Community Education program discussed below.

Certification Programs and Classes for Irrigation Professionals

In March 2004, the District ran an Irrigation Efficiency Workshop, which was attended by 24 members of the community and landscape industry.

In June 2005, a Drip and Subsurface Irrigation Workshop was held in association with RainBird Corporation and The Associated Landscape Contractors of Colorado – Mountain Chapter with 17 attendees.

In April 2006, an Irrigation Workshop Series was held in association with the Irrigation Association with 12 attendees. Workshop classes included Principals of Irrigation, Sprinkler Scheduling, and Certified Landscape Irrigation Auditor Training and Exam.

In 2008, the District partnered with Eagle County to hold a one-day workshop with landscapers on Irrigation Technologies. The District hopes to hold annual workshops in the future.

An Irrigation Association Landscape Irrigation Auditor class is being organized for July 2009. The District will sponsor this event by organizing, advertising, and providing the facilities for the event, as well as Irrigation Association certification exams.

The District will continue to implement this program and will allocate $500–1,000 plus staff time and marketing costs annually to programs as needed.

Industrial and Commercial Efficiency

Signage and Programs to Encourage Water Conservation by Guests at Hotels, Rental Properties, and Restaurants (revised program name: Tourist Industry)

The District works with local hotels, restaurants, and rental agencies to encourage water conservation. The District provides free table tents and door hangers to interested managers of hotels, rental agencies and restaurants. One hundred of these items were given out in 2004, although no follow up has been performed since then. For hotels, the District typically contacts the housekeeping manager to gauge interest in participating in a free linen reuse and water conservation program. Hotel signage encourages guests to turn the tap off when brushing teeth, promptly report leaky faucets and running toilets to management, and to use towels and bed linens more than once during multiple night stays. Restaurant managers are asked if they would like to participate in a "Request for Water/Water on Demand" program by which restaurants serve water to guests only when requested, as noted on table tents. However, according to District records, only one restaurant in Vail officially has this policy in place. Rental agencies managing vacation rentals such as condominiums or townhomes that have daily maid service can participate in the linen reuse program. Those entities that do not participate (usually hotels) already have their own similar program in place or they do not provide daily maid service. There are roughly 18 hotels (1,909 rooms in Vail) that have already initiated their own linen reuse program. Currently, nine hotels and a couple of rental agencies are still participating in the District's "Project Planet" program from previous years, which equates to over 462 rooms and bathrooms in Vail (some hotels and condominium units have more than one bathroom or room). The District is also creating its own linen reuse program, by which it has designed door hangers for hotels that include the District's logo. Currently there are approximately 1,008 rooms in Vail that will participate in the District's new program.

The District is in the process of creating the new Linen Reuse door hangers and allocated approximately $1,767 plus staff time and marketing costs to implement the Tourist Industry program, which will then continue annually.

Lodging Sector Voluntary Conservation Programs

Since 2004, approximately 1,909 rooms in the Vail lodging sector have had their own programs to encourage guests and patrons to utilize indoor water efficiently. These programs include linen reuse notifications in individual rooms and leak detection programs, which request information from the customers and staff. These programs are considered voluntary conservation programs because the lodging entities have implemented these programs on their own without assistance from the District. Although the District does not directly influence these programs, the savings attributed from these voluntary conservation programs can be considered overall service area savings. As new hotels come online, the District's Water Conservation Officer will continue to track implementation of these programs and gauge interest in using the District's programs.

Education/Information Distribution

Community Education (revised program name: Public Education)

The District uses a variety of means to educate its customers about water conservation. These include public seminars, workshops, presentations, tours, convention booths, newspaper ads, radio messages, mailings of Waterwise information and tips, and customer water use audits. The District regularly creates educational and informative ads that air on local radio stations KTUN, Jack, and KSKE, which are typically only received in Eagle County. Past radio ads have covered topics including irrigation regulations, seasonal adjustments to irrigation schedules, reminders to stop irrigation or to blow out irrigation systems for the winter, and other water conservation-related topics. The Water Conservation Officer is also always available for public calls concerning general questions, irrigation violations, and water conservation assistance.

Public Education will continue to be implemented annually with at least $500 plus staff time and marketing costs allocated for these programs each year. This program also includes the District employee education and Irrigation and Waterwise Landscaping Educational Materials described below.

Irrigation + Waterwise Landscaping Seminars for the Public (revised program name: Public Education)

The District's website provides information for residents on a variety of outdoor water conservation methods, many of which describe efficient irrigation practices. This information includes the District's Water Use Regulations, Selecting Mountain Adapted Plants, Tips for Maintaining an Automated Irrigation System, Improving Irrigation Efficiency, publications from Colorado State University, Frequently Asked Questions, Irrigation Efficiency Certification, among others. The District also has different publications – Drip Irrigation for all Climates, Gardening Watering Systems, The Complete Irrigation Workbook, and All About Sprinklers and Drip Systems – available for review at the District's main office. All of these books were donated by the District and are also available for check out at the Vail Library. Informational brochures are also available at no cost in the District's customer service area. Topics include:

"A Consumer's Guide to Water Conservation"
"Yes you can fix a leaky faucet by yourself"
"Let's Learn About the Water Cycle"
"Xeriscape for Low Maintenance Yards"
"Xeriscape, Three plans for year round beauty"
"Xeriscape, Three plans for heavy duty xeriscapes"
"Xeriscape, Four plans for dry shade"
"Xeriscape, Five plans for narrow strips"
"Xeriscape, Three plans for xeriscape on a budget"
"Xeriscape, Four plans for slopes"

The District will continue to offer educational information to its customers year round. This information is included under the Public Education program which has at least $500 plus staff time and marketing costs allocated for program support annually.

District Employee Education (revised program name: Public Education)

District employees are educated on the District's water conservation principles through quarterly employee meetings, customer service presentations and materials, employee newsletter articles, and update reports to departments and Boards.

The District will continue to implement this program annually as part of the Public Education program.

Youth Education (revised program name: Youth and Teacher Education)

Local schoolchildren are educated on principles of indoor and outdoor water conservation through instructive materials, water plant tours, presentations, and free conservation kits to install at home. District staff has been going to local elementary schools during National Drinking Water Week (the first week in May) since 1988. In August 2005, the District started the Thirsty Lizard Project to teach middle school students good water use habits while incorporating math and science skills by having the school children track and graph their water usage for two weeks. The District supplied the materials, and the Water Conservation Officer organized the program with the teachers who presented the lessons. Four schools participated in this program. This program did not continue through 2007, but there is interest by the current Water Conservation Officer in renewing it.

In 2005, the District made four conservation presentations at local schools and water treatment plant tours were given to 306 students ranging from 3rd grade to 8th grade. In 2006, five conservation presentations and tours educated 316 students ranging from Kindergarten to 8th

grade. In 2007, 67 students ranging from 3rd grade to high school were educated at four presentations and tours at the District's water and wastewater facilities.

The District also sponsors a school program called Living Wise that incorporates principles of conservation of water and electricity for fifth graders. In 2007, 181 students participated in the Living Wise program, and in 2008, 234 students participated. The District is also making modifications to this program to incorporate a water conservation-specific lesson.

Youth and Teacher Education will continue to be implemented annually by allocating the necessary funds for the programs to continue successfully.

Indoor Water Audits

The District recognized a need for indoor water audits beginning in 2008. Free High Water Use Audits had been offered to District customers for years, but with the increase in the green movement, more customers were calling and looking for help reducing their water use. In 2008, the Water Conservation Officer started doing site visits with residential, commercial, and mixed use customers to show them different ways to improve their water usage habits. The Water Conservation Officer brings information on the specific customer's current and historical water usage and explains any problems observed. The Water Conservation Officer will then go through the building with the customer and show them different ways to improve water usage by using different fixtures. Discussion with the customer includes recommendations for switching to efficient showerheads, toilets, aerators (bathroom and kitchen sink), washing machines, and dishwashers, as well as irrigation tips. Fortunately the District can offer many of these items to the customer through the Free Conservation Kit program for immediate savings (except large appliances). The Water Conservation Officer will bring samples of each item in the Free Conservation Kit to the audit to show the customer how easy it is to make the suggested changes. It is also beneficial for the Water Conservation Officer to get feedback from customers on all of the items offered in the kit. Information on Waterwise landscaping and irrigation tips are also provided to the customer during the audit.

The District will continue the implementation of this program as it is very beneficial to customers as well as the District.

Water Conservation Webpage

The District's website has a "Waterwise" webpage (http://www.erwsd.org/wise-use) that contains a variety of information on water use regulations, irrigation efficiency tips, upcoming events, and the Water Supply Emergency Plan.

The entire website has recently been updated and expanded to include additional information. The Waterwise webpage will be updated consistently as needed.

Encouraging Water Conservation through Water Rate Structures and Billing

Inclining Tiered Water Rate Structure (revised program name: Water Rate Structure)

In June 2003, the District implemented a tiered water use rate structure, designed in part to encourage water conservation. As customer water use increases, the customer may move into a higher water use tier and be charged higher water rates (see "Water Service Rates" under the "Water Costs and Pricing" section above).

The District will continue to review rates and water restrictions annually under the Water Rate Structure program, which also includes Voluntary Separate Metering and Meter and Pay for Construction Water Use, as described below.

2008 Billing System Upgrade

In September 2008, the District switched to a new billing system that combines billing and customer information. The system enables the District to provide customers with additional details

about their current and historical water use. It also enables the District to bill customers within a week of meters being read. Prompt monthly billing allows customers to adjust their water use on a timely basis, in response to their bill. This program will also include the Billing Message Blocks and Inserts, described below.

Billing Message Blocks and Inserts (revised program name: 2008 Billing System Upgrade)

The new billing system will provide graphical data on individual account usage. In addition to global message blocks on the bill, the new billing system will allow for personalized messages geared to specific customers or groups of costumers, which was not possible previously.

The District will continue to use this message tool throughout the year for water conservation information and program information dissemination as part of the 2008 Billing System Upgrade program.

Voluntary Separate Metering (revised program name: Water Rate Structure)

Separate metering for indoor and outdoor water use has been an option for customers since the District's predecessors took over the water systems in Vail around 1964. The District does not require customers to install separate meters but allows it if requested. Separately metering indoor and outdoor uses enables account holders to monitor and manage water usage more closely.

The District will continue to offer separate metering to customers when installation requests are received as part of the Water Rate Structure program.

Meter and Pay for Construction Water Use (revised program name: Water Rate Structure)

The District uses this standard operating procedure as another means of tracking water usage. As construction projects start in Vail, a meter must be rented from the District to access fire hydrant water for the project site. The District meters the project's usage from the hydrant and charges the customer accordingly until water service is connected to the main distribution system. This is another way the District will continue to regulate water accounting.

Regulations/Ordinances

District Water Use Regulations

- The District enforces the following mandatory Water Use Regulations: Landscaping may be irrigated only three days per week and is based on address. Odd-numbered addresses can water on Tuesday, Thursday, and Saturday. Even-numbered addresses can water on Wednesday, Friday, and Sunday. The Water Conservation Officer and District staff can monitor the watering schedule as they drive around the valley to and from work;
- No outdoor watering is allowed on Mondays;
- No outdoor watering is allowed between 10 a.m. and 4 p.m.;
- Wasteful irrigation (i.e., using free-running hoses without nozzles or sprinklers) is prohibited;
- Special permits are issued as needed for newly planted areas, allowing extra irrigation for root establishment;
- Swimming pools may only be filled once per year unless draining for repairs is necessary; and
- Water will be used for beneficial purposes only.

The District posts the mandatory watering schedule on the District's website and includes inserts in billing statements at the beginning of the irrigation season. The District also runs newspaper ads, radio ads, and billing messages throughout the irrigation season as reminders. During periods of drought or supply shortage, stricter restrictions can be imposed. The District enforces these rules year round, and enforcement was increased in 2007. During irrigation months, the Water Conservation Officer drives around the District's service area at least once a week to check for watering violations. All District vehicles have a Water Use Violation Report packet so

District employees may report violations to the Water Conservation Officer. The first violation for a customer results in a warning letter and a personal call from the Water Conservation Officer. When the Water Conservation Officer makes a personal violation phone call, the customer is reminded of the District's irrigation schedule and is assisted in determining if their irrigation system is malfunctioning. The second violation prompts a letter with a $100 fine and a second call. The third violation includes a letter with a $500 fine and a third call. After a fourth violation, the customer's irrigation system is shut off.

The District reviews the Water Use Regulations annually and will continue to implement these rules year round for conservation purposes. It is important to note that additional water use and irrigation restrictions may be imposed during periods of drought.

Collaboration with Other Entities to Encourage Green Building and Water Efficient Practices (revised program name: Collaborate with Land Use/Governmental Agencies)

In 2008, the District began meeting regularly with the Town of Vail (TOV) Parks and Landscape Maintenance Department and Environmental Health Department to increase collaboration on water conservation ideas. Discussions involve encouraging green building, other green renovations, and other potential changes to enhance water conservation. The initial meeting's main goals were to establish relationships, share each group's function, and identify how the groups can work together to further water conservation practices in the TOV. The District hopes to continue and build upon these interactions and collaborations in the near future. For example, collaboration with other entities such as Eagle County could encourage discussion of opportunities for water conservation in the land development sector. These may include implementation of construction Best Management Practices (BMPs) to minimize areas disturbed during new development that will subsequently require revegetation, or requiring the routing of runoff to landscaped areas. Education and incentives could also be provided for developers, including a potential program by which only certified landscapers are used in the area for purposes of regulating irrigation systems and irrigated acreage, or encouraging the use of appropriate soil amendments, plant materials, and landscape products to ensure water efficient practices through the use of retrofit and restoration ordinances. Further discussion involving implementing water budgets for new projects and implementing land use regulation policies could also occur between applicable entities.

The District's water rights portfolio includes water rights for the Vail Ski Area snowmaking diversion located on Gore Creek. In 2001, AMEC's Boulder office worked with Vail Associates on the development of a water conservation program for the snowmaking water supply systems at the Vail and Beaver Creek ski areas. This effort included a detailed analysis of water sources, water rights, and the water use patterns and trends associated with snowmaking and ski area operations. Information from this analysis was used to identify water management problems and challenges and to develop water management goals and conservation strategies. The Water Conservation Program identified a number of specific measures designed to conserve water and improve water management and operational efficiency of the snowmaking systems. In addition, the program identified supply-side water management strategies to enhance streamflows and mitigate the impacts of water diversions.

The District's water rights portfolio also includes water rights for irrigation of the Vail Golf Course, which is operated by the Vail Recreation District. In cooperation with the Vail Recreation District, the District funded the installation of a weather station at the Vail Golf Course, which is used to calculate evapotranspiration rates and the amount of water needed for efficient irrigation. Collaboration with Land Use Agencies will continue to be implemented annually to keep relations and goals consistent and transparent between entities within the valley.

Other Water Management Activities

Water Conservation Officer Staff Position

The District has had a part-time water conservationist on staff since 1995, and a full-time officer since 2003. The Water Conservation Officer communicates with the public and relevant District departments to create and manage conservation programs and activities. The Water Conservation Officer is tasked with:

- Promoting actions that result in long-term increases in the productivity of the District's water supply;
- Implementing conservation strategies, including technological and behavioral changes, education, and regulatory actions;
- Implementing the Water Conservation Plan for the District, measuring its effectiveness, and completing necessary reports;
- Recommending policies to satisfy water supply needs without compromising desired water services; and
- Targeting customers with water use in Tier 3 and working to educate them on efficient water usage strategies.

Continuing involvement in the community by participating in the following organizations to improve the education of the community as well as the District staff:

- Colorado Watershed Assembly Network
- Eagle River Watershed Council
- American Water Works Association
- Water Environment Foundation
- Colorado Foundation for Water Education
- Colorado Water Congress

Water Reuse and Raw Water Systems

Indirect Use of Effluent Return Flows (for Vail snowmaking)

Indirect use of effluent return flows from the Vail WWTP during the low streamflow months of November through February currently provides, on average, 20% to 30% of the approximate 400 AF, or 80 to 120 AF, of water used by Vail Associates for snowmaking on Vail Mountain. In the future, it is anticipated that this demand could increase to 603 AF per year, with an indirect use of effluent return flows component of 120 to 180 AF per year. By 2015, it is expected that the use of effluent return flows could reach 150 AF per year.

Water and Wastewater Treatment Plant Efficiency (revised program name: Treatment Facility Water Conservation and Efficiency Opportunities)

All of the District's WWTP's use non-potable treated wastewater in their operations. Below is a description of specific measures at each location.

Vail WWTP
Non-potable water is recycled at the Vail WWTP for cleaning the plant and pump lubrication. Non-potable water is also used for outdoor irrigation at District offices during the summer. A small amount of water consisting of a drip and spray system is used for approximately 11,000 irrigated square feet.

Avon WWTP
Outdoor irrigation in the summertime occurs with non-potable water. Inside the plant, non-potable water is also used to clean. Additionally, water is recycled for some of the systems, such as wash water for the gravity belt thickener, which is washed continuously when in operation. Non-potable water is also used for seal water in some pumps; and other pumps have been upgraded with mechanical seals versus water lubrication to eliminate wasted pump water. The new polymer system uses only non-potable water for polymer batching and dilution water.

To encourage water and wastewater plant efficiency, the District will continue to identify opportunities for water conservation and process improvement through the Treatment Facility Water Conservation and Efficiency Opportunities program.

Conversion to Raw Water Supply for Parks and Open Spaces

The District has recently begun working with other agencies to promote the use of raw water from Gore Creek for irrigation rather than treated water. While this does not decrease the total volume of water used, it decreases water treatment and distribution system demands and results in energy and cost savings. In 2008, two parks owned by the Town of Vail, Ford Park and Donovan Park, were converted so that raw water can be used for irrigation. While the source of water is entirely river water, the park irrigation systems have the capability to convert to potable water if needed. The irrigation maintenance for these parks is managed by the Vail Golf Course Superintendent, who is certified and well-educated on all irrigation and landscaping maintenance best management practices. The District has had consistent communication with the maintenance staff and is confident that the irrigation systems at these two parks are running efficiently.

The District will continue to analyze and potentially implement raw water conversion opportunities as they arise within the service area.

Distribution System Efficiency

Free High Use Water Audits/Individual Account Leak Detection (revised program name: Customer Service)

Through its Distribution and Collection Department, the District provides free high water use audits to customers who have an unusually high increase in their water bills. Following each meter reading cycle, the District's billing software flags accounts with abnormally high or low readings based upon historical usage. The District's customer service staff then informs these customers of the situation, and if requested, an audit is completed on the indoor fixtures, meter, and irrigation system. The audit is performed by a meter reader who will check for leaks in the toilets, sinks, etc., as well as check to make sure the meter is not running abnormally. Running or leaky toilets or malfunctioning home water treatment or filtration systems are often the culprit of high readings. During the irrigation season, irrigation system leaks or billing problems are also frequently found. If there is a leak identified in the irrigation system in the line after the meter, it is the homeowner or property owner's responsibility to fix the leak. The District does not force the property owner to fix their leak, but it is in the customer's best interest because their water bill is usually much higher than normal. If the owner fixes the problem, the District gives a one-time refund for the water billed from the leak. This refund only happens if the owner can show that the leak was fixed. Low readings are usually due to broken meters or can occur as a result of infrequent usage, usually if the customer is out of town or a second homeowner.

Customer service staff documents all unusual patterns for accounts, and they also send out letters questioning occupancy patterns so that they can note any expected unusual readings for future notice. With this information, customer service staff is able to identify normal zero reads, and therefore do not have to investigate each problem every month because there are some accounts for which these occurrences are expected.

The District encourages coordination between all departments to ensure that an effective high water use audit program is in place. The Customer Service program will continue to be implemented year round to keep customers aware of their high use issues.

System Maintenance, Leak Detection and Repair

The water distribution system serving the Town of Vail is highly susceptible to leaks, due to highly variable soils and geologic conditions, the age of portions of the water system, the potential for freezing, and high pressures due to the large elevation differentials in the service area. The District implemented a leak detection program in 1992 to ensure that the water distribution

system operates efficiently and effectively. When leaks are found through sounding and other means, repairs are made promptly. The District's Distribution and Collection crews check every water main in the system annually with sounding equipment, and the wastewater mains are periodically checked with remote control video cameras. The District normally hires subcontractors for this work. In Vail, this leak detection program covers over 64 miles of water main.

The District will continue to implement this program.

Non-Revenue Water Committee

In October of 2004, the District created a Non-Revenue Water Committee (NRWC) to address non-revenue water in the system. The NRWC consists of District employees who meet and discuss ways to find lost water within the system. Each member is from a different District department and brings different skills and ideas to the group. Employees on the Committee include:

Water Operations Manager
Distribution and Collection Manager
Water Conservation Officer
Utility Billing Accountant
Meter Services Coordinator
Assistant General Manager
Mechanical and Electrical Supervisor for Water
Administrative Analyst
Raw Water Resources Operator

A priority for the NRWC is identifying and addressing un-metered use. The District's new billing system will help locate areas where water is being lost by pairing production and customer consumption data by geographic areas. The new billing system will also help track the age of customer meters. This has also been a priority for the NRWC because the District has had a meter replacement, testing and maintenance program in place since 2002 and is working diligently to keep this program up to date and in compliance with the AWWA standards. The NRWC is also working on combining metering improvements in large construction projects to help isolate some areas of Vail for consumption and production comparison tests. In June 2008, a representative from HDR retrained the committee on the Water Accounting Module that is used for all of the lost water accounting. This program is currently under scrutiny and will be thoroughly examined for problems by the Committee members.

Other responsibilities of the NRWC include checking meter accuracy within the District, verifying consumption and production, improving production reports, inspecting customer files for abnormal usage patterns, producing a long term plan on how to reduce non-revenue water, working with Eagle County to determine future development plans based on water rights available, and accurately recording water loss.

The District will continue to implement this program.

Identification of Potential Conservation Measures and Programs

An initial, comprehensive list of conservation measures and programs was developed to evaluate those which would be most applicable to the District to carry forward for detailed evaluation. This list was compiled based on measures and programs that are already in place, conservation activities included in the CWCB guidance document that must be considered per requirements of § 37-60-126, and those that were identified during the Plan development process.

Water Conservation Community Advisory Committee

The District is committed to working closely with the community in which it operates. When it started working on its Plan, the District decided to involve a wide variety of stakeholders from the beginning of the Plan development to assist not only in developing potential conservation activities, but also to evaluate these activities and ensure stakeholder support of the Plan. A Water Conservation Community Advisory Committee (WCCAC) was formed with nearly 30 volunteer members representing governmental agencies, private industry, non-governmental agencies, and citizens. The District is grateful for their invaluable input throughout the Plan development process. The Committee included representatives from the following entities:

Town of Vail	Cascade Hotel
Eagle County	The Charter
Vail Resorts	Manor Vail
Eagle River Watershed Council	Sonnenalp
Betty Ford Alpine Garden	Lions Square Lodge
Eagle Valley Alliance for Sustainability	Black Dog (landscaping)
Vail Recreation District	Oasis Landscaping

An initial meeting was held on March 12, 2008 to introduce the Committee to the Water Conservation Plan process and to solicit its assistance in developing the initial water conservation measures and programs list. Members of the CWCB were also in attendance. Focus groups were formed during the meeting that contained representatives from the following core areas:

Education
Hotel and Restaurant
Landscaping and Irrigation
New Construction and Development
Residential, HOA, General, and Other

An overview of the District's service area was given, including background on water conservation planning and the role of the Committee in this process. After, each sub-group was tasked with compiling a list of conservation activities applicable to their focus area, and then identifying the main ideas from that list. A summary of each focus group's top ideas is presented in Table 6–13. Note that there was some overlap of top ideas between focus groups, e.g., water audits were in the Hotel and Restaurant focus group as well as the Landscaping and Irrigation focus group.

Focus group members also filled out a worksheet for each of their top ideas which described the activity in more detail, noted the target population, estimated costs of the measure, and identified any issues or obstacles. This information was used during the conservation measure screening and evaluation process.

Table 6-13: Water Conservation Community Advisory Committee Focus Groups Top Conservation Measures and Programs

Representative Groups	Top Conservation Measures and Programs Identified
Educational Focus Group	
Eagle River Watershed Council Betty Ford Alpine Gardens Gore Range Natural Science School Vail Recreation District	Education and outreach
	Hotel education
	Youth education
	Webpage education
	Education for new developers
	Irrigation classes for landscape companies
Hotel and Restaurant Focus Group	
Town of Vail Cascade Hotel Lions Square Lodge Manor Vail	Retrofit and restoration ordinances
	Indoor and outdoor water use audits
	Green Lodge program
	Community sustainability
	Incentives and information on appliances
	Landscape management
	Employee training information
	Owner messaging and sales
Landscaping and Irrigation Focus Group	
Town of Vail Landscaping Town of Vail Irrigation Black Dog (landscaping) Oasis Irrigation Company Vail Recreation District (Vail Golf Course)	Increasing education
	Efficient irrigation technology, regulations, and education
	Watering schedule
	Incentives for larger second homes
	Weather-based irrigation clocks
	Free irrigation audit program
	Certification of irrigation contractors
	Town of Vail suggestions and regulations
	Rain sensor incentives
New Construction and Development Focus Group	
Eagle County Town of Vail	Water budgets for new projects
	Graywater system requirements
	BMP's for construction water use
	Efficient fixtures
	Route runoff to landscaped areas
	Minimize construction disturbance
	Land use regulation policies
	Water use and metering requirements by individual units
Residential, HOA, General, and Other Focus Groups	
Eagle County Town of Vail Eagle Valley Alliance for Sustainability	Pricing Structure
	Centralized ET and Irrigation computer system
	ET rates published
	HOA turf reduction program

Comprehensive List of Conservation Measures and Programs

Compiling the initial, comprehensive list of conservation measures and programs was an essential step in the Plan development; however, many of the measures and programs in the list are redundant because the list was assembled using input from various groups and therefore the measures and programs often had similar themes or goals. Additionally, due to its broad and often overlapping nature, this comprehensive list went through various ranking, screening, and grouping exercises as described below and in Section 7. These steps were used to refine the list to reflect the most relevant water conservation measures for the District to focus on now and in the future. Though highlighting this final set of conservation measures and programs was the ultimate goal, a record of the initial, comprehensive list is included in the Plan for potential future use by the District. As such, the initial, comprehensive list is shown in Appendix B as Table B-1, and also indicates whether an activity is currently an existing measure, a new measure or program, or a previously existing program that could potentially be implemented.

Initial Ranking of Conservation Measures and Programs

After development of the comprehensive list, several initial criteria were developed to conduct a preliminary prioritization of potential water conservation activities and to identify measures and programs that should be removed from further consideration. This ranking was a high-level analysis that identified and removed those measures or programs in the comprehensive list for which evaluation or implementation may not be feasible at this time. The ranking process also combined measures with another program to avoid redundancy and identified measures needing additional information or definition. The results of this ranking exercise, which included input from the WCCAC and the District's Management, is presented in Appendix C.

SECTION 7 – EVALUATION AND SELECTION OF CONSERVATION MEASURES AND PROGRAMS

After the initial ranking of conservation measures and programs, those that warranted further evaluation underwent a detailed analysis of potential water savings and costs. This process was used to select programs for implementation that aligned with the District's water conservation goals and other considerations such as feasibility of execution, educational benefits, and community acceptance. Table 7-14 presents the measures selected for implementation as a result of this analysis. A description of the process used to attain this list is described below. This section provides a description of new conservation measures and programs selected for implementation.

Appendix D provides detailed information on each evaluated measure, including target sector, status, description, assumptions, potential annual water savings, and the District's staffing requirements and implementation costs. Certain measures and programs involved a one-time implementation, thus are not marked as "continued" in the table below. Others were cost-prohibitive and were removed from consideration. Examples include the Indoor Retrofitting at District Facilities or the Residential Dishwasher Rebate program, and these are not included in Appendix D.

Table 7-14: Conservation Measures and Programs Selected for Implementation

Water Conservation Measures and Programs	Implementation Status	
	Continued	New
Water Efficient Fixtures and Appliances and Incentives		
Free Indoor Water Conservation Kits	x	
New and Retrofit Fixture Incentives: Commercial	x	
Indoor Retrofitting at District Facilities	x	
Toilet rebates – ultra-low flush or dual flush: Residential		x
Tap fee incentives for new development		x
Landscape Efficiency		
District Waterwise Landscaping and Demonstration Gardens	x	
Landscape and Irrigation Audits: Residential, Commercial, and HOA	x	
Certification program and classes for landscape/irrigation professionals	x	
Free Outdoor Water Conservation Kits		x
Rain Sensor Incentive		x
Evaluation of landscape and irrigation plans for new development and redevelopment		x
Industrial and Commercial Efficiency		
Tourist Industry	x	
Lodging Sector Voluntary Conservation Programs	x	
Commercial and Industrial Water Conservation Education and Support	x	
Low-Flow Commercial Pre-Rinse Spray Washers		x
Education/Information Distribution		
Public Education	x	
Youth and Teacher Education	x	
Indoor Water Audits	x	
Water Conservation Webpage	x	
Encouraging Water Conservation Through Water Rate Structures and Billing		
Water Rate Structure	x	
2008 Billing System Upgrade	x	
Uniformity Project		x
Regulations/Ordinances		
District Water Use Regulations	x	
Collaborate with Land Use/Governmental Agencies	x	
Other Water Management Activities		
Water Conservation Officer Staff Position	x	
Water Reuse/Raw Water Systems		
Indirect Use of Effluent Return Flows (for Vail snowmaking)	x	
Treatment facility Water Conservation/Efficiency Opportunities	x	
Distribution System Leak Identification and Repair		
System Maintenance, Leak Detection and Repair Program	x	
Non-Revenue Water Committee	x	
Customer Service	x	

Description of New Measures and Programs Selected for Implementation

A description of water conservation measures and programs selected for implementation is provided below. Refer to Section 6 for information on existing programs.

Water Efficient Fixtures/Appliances and Incentives

Toilet Rebates – ultra-low flush or dual flush: Residential

This program will involve providing 20 rebates of $75 annually to residential customers on a first come first serve basis to replace 3.5 gpf or higher flush models with ultra-low flush toilets (1.6 gpf or less) or dual flush toilets (1.6 gpf or less for a full flush and 0.8 gpf or less for a urine flush). Rebate recipients would be required to show proof that a higher flush model was replaced with a lower flush toilet before the rebate is approved. Models included on the Environmental Protection Agency's (EPA) WaterSense list would be eligible for the rebate, which would target Residential customers. A recycling program could be implemented for fixtures being replaced. The District anticipates this program will have an annual budget of $1,500 plus staff time and marketing costs for implementation and administration.

Tap fee incentives for new development

Tap fee or connection fee incentives would be given to new developments that install fixtures surpassing current plumbing code requirements or implementing measures such as dual plumbing, hot water recirculation systems, or Waterwise landscaping. To ensure an effective program, a water budget or contract would need to be tied to each property to ensure the fixtures or measures are not replaced with less efficient ones in the future. Effective implementation of this conservation measure would be enhanced through cooperation with the Town of Vail and Eagle County.

Landscape Efficiency

Free Outdoor Water Conservation Kits

This program will provide outdoor water conservation items at no cost to District customers. Items will include rain gauges, moisture meters, and multi-spray hose nozzles. To ensure customers only take what they will use, customers will be able to take separate items rather than the whole kit, similar to the indoor water conservation kit program. Additional information will be available for hose timers, irrigation audits, irrigation efficiency, and Waterwise landscaping. Items will also be used as giveaways for tours or special events. The District anticipates this program will have an annual budget ranging from $1,000–1,500, plus staff time and marketing costs per year.

Rain Sensor Incentive

This incentive program will provide up to 20 rain sensors free of charge to District customers per year. Rain sensors are devices connected to automatic irrigation systems that cause the system to shut down during rainfall. The device can override a scheduled irrigation cycle when the water collection cup or sensor detects water. Once the rainwater evaporates from the device, the scheduled irrigation resumes. The sensors are a simple and economical way to ensure that an irrigation system is watering only when necessary. The District anticipates this program will have an annual budget of $600, plus staff time and marketing costs per year.

Evaluation of Landscape and Irrigation Plans for New Development and Redevelopment

The District requires site plans and floor plans for each new account for purposes of calculating a tap fee, but currently does not account for outdoor irrigated acreage. The District will encourage estimations be made regarding irrigated area or, if available, a landscape plan referenced for this information prior to sizing and purchasing meters for new accounts. This will ensure that the correct meter size is installed based on both expected indoor and outdoor water usage. Ensuring the correct meter size will help with non-revenue water issues, as inappropriately sized meters have a tendency to either over or under-read. This measure will include acquiring more data on water use and metering requirements for multi-unit dwellings for uniformity issues and meter

sizing. More detailed information needs to be gathered on the program before an estimated budget can be determined.

Industrial and Commercial Efficiency

Low-Flow Commercial Pre-Rinse Spray Washers

A low-flow pre-rinse spray valve installed in commercial or institutional settings is an easy and cost effective means to decrease water use. Typical spray valves use up to 3.0 gpm while low-flow spray valve retrofits typically use only 1.6 gpm. All school cafeterias and restaurants will be targeted under this program by which valves would be installed at no charge. The District anticipates a budget of $1,500, plus staff time and marketing costs per year, which will allow for 52 sprayers to be given out annually.

Encouraging Water Conservation through Water Rate Structures and Billing

Uniformity Project

When establishing new Commercial, Residential, and Mixed Use customer accounts, the District assigns SFEs based upon the guidelines provided in Table A-1 of the Rules and Regulations. The Uniformity Project will be implemented to cross-check the number of SFEs with the account status while taking into consideration any building modifications since the account was set up. This is an important project for the District, ensuring that all accounts are established under the correct account status and that SFEs are accurately assigned for water use monitoring.

Estimated Costs and Water Savings of Conservation Options

Comparing costs and water savings of conservation activities is an important evaluation tool that can assist as water managers select and prioritize appropriate conservation measures and programs for implementation. However, an analysis of costs and water savings may not be appropriate for all potential conservation measures and programs, due to lack of quantitative data or the qualitative nature of the measure or program, e.g., education programs or billing message inserts. Though the benefits of a measure or program may include water savings, for many it is extremely difficult to assess actual changes in water use; therefore, costs and water savings should not be the only criteria applied in selecting activities. As such, measures and programs of a qualitative nature are evaluated as described in this section, and the measures and programs evaluated in Table 7-15 are those for which existing data made it possible to reasonably estimate costs and water savings.

To allow for a consistent basis of comparison when beginning the evaluation process, costs and water savings presented in Table 7-15 are based on single units only for potential new and ongoing District conservation programs. For example, costs and water savings are presented for one toilet rebate per year, one landscape irrigation zone audit per year and so forth, rather than the total number of toilet rebates or irrigation zones that will actually be included in those programs if selected for implementation. This methodology allowed the District to establish the potential water savings and associated costs for a single unit without first having to choose a specific number of toilet rebates to be given out as part of a program. This assisted the District with appropriately budgeting for each measure or program. A decision on specific number of units or rebates was then made based on a comparison of unit costs to implement the program, resulting water savings, and program budget.

Estimated water savings have not been adjusted for savings related to voluntary conservation programs or replacement rates for fixtures and appliances that would have been installed without program implementation. A seven-year horizon was used for these calculations, which is a concept level analysis, and therefore does not consider escalating costs or inflation over time. A complicating factor in the process of estimating potential water savings is that many conservation measures are interrelated or work together in a manner that can result in double counting of the potential water savings associated with individual measures. Where applicable, adjustments have been made to avoid double-counting of water savings and implementation costs

Table 7-15: Costs, Water Savings and Ranking of Single Unit Conservation Measures and Programs
(shown on a per unit basis; for comparison purposes, assumes one new unit is added each year for seven years unless specified as a one-time program)

Water Conservation Measures and Programs	Number of New Units Annually (ongoing or one-time)	Estimated Annual (or one-time) Costs ($)	Total over Seven-Year Time Period (2009 – 2015)			Ranking (1 = most desirable)	
			Total Estimated Cost[1] ($)	Total Estimated Water Savings (gallons)	Cost per AF water saved ($/AF)	By volume water saved	By cost per AF water saved
Water Efficient Fixtures/Appliances and Incentives							
Free Indoor Water Conservation Kits	1 kit (ongoing)	$14	$100	195,455	$168	6	4
New and Retrofit Fixture Incentives: Commercial	1 set of 50 kits (ongoing)	$464	$3,248	2,659,359	$398	2	5
Install Waterless Urinals at District Facilities	1 urinal (ongoing)	$600	$4,200	112,320	$12,185	8	12
Toilet rebates – ultra-low flush and/or dual flush: Residential	1 rebate (ongoing)	$75	$525	261,444	$654	4	6
Urinal rebates – low-flow and/or waterless: Commercial	1 rebate (ongoing)	$50	$350	128,800	$885	7	8
Appliance rebates – washing machines: Residential	1 rebate (ongoing)	$75	$525	240,924	$710	5	7
Appliance rebates – dishwashers: Residential	1 rebate (ongoing)	$100	$700	9,417	$24,221	11	13
Landscape Efficiency							
Landscape and Irrigation Audits: Residential/Commercial/HOA	1 zone (ongoing)	$50	$350	74,155*	$1,538	9	10
Turf/high water use landscaping buy-back/incentive program	1 ft^2 (ongoing)	$1	$4	155	$7,342	13	11
Industrial and Commercial Efficiency							
Tourist Industry	1 room (one-time)	$2	$2	4,200*	$136	12	3
Low-Flow Commercial Pre-Rinse Spray Washers	1 sprayer (ongoing)	$29	$203	1,558,200	$42	3	1
Education/Information Distribution							
Youth and Teacher Education	1 kit (ongoing)	$20	$137	44,431	$1,001	10	9
Water Reuse/Raw Water Systems							
Treatment Facility Water Conservation/Efficiency Opportunities	1 pump seal (one-time)	$1,012	$1,012	6,990,480*	$47	1	2

[1] Costs do not include existing staff time or marketing costs; assumes constant rate of implementation each year except for Tourist Industry program and Treatment Facility Water Conservation/Efficiency Opportunities.

* Water savings not cumulative: Landscape and Irrigation Audits - assuming audit suggestions do not necessarily stay in place year after year, therefore watering schedules may be changed each following year; Tourist Industry - assume all remaining rooms would be retrofitted in first year; Treatment Facility Water Conservation/Efficiency Opportunities - pump seal replacement is one-timea

As presented in Table 7-15, measures and programs were also ranked by cost and volume of water saved. For evaluation of the cost effectiveness of individual conservation measures, the District used a cost of $6,000 as the maximum cost per AF of savings. This amount was based roughly on the estimated cost of augmentation water during the summer irrigation season. It is important to note, however, that the market value of water cannot be fixed as it is highly variable depending upon many water rights and geographic, hydrologic, and economic factors. The District recognizes that the cost effectiveness of an individual conservation measure is only one of the criteria to be considered in the process of developing a conservation plan.

This ranking exercise eliminated those programs that did not meet the District's criteria of costing less than $6,000 per AF of water saved, or those that had low potential water savings. Programs eliminated based on these criteria include:

- Install Waterless Urinals at District Facilities – $12,185/AF water saved and eighth lowest volume of water saved
- Appliance rebates – dishwashers: Residential – $24,221/AF water saved and thirteenth lowest volume of water saved
- Turf/high water use landscaping buy-back/incentive program – $7,342/AF water saved and lowest volume of water saved

The Conversion to Raw Water Irrigation Supply for Parks and Open Spaces Education program will also be removed from further evaluation because it does not provide water savings. Rather, it changes the water source, which reduces the treated water demand on the District's distribution system during high usage periods, such as the summertime.

The remaining water conservation measures and programs were evaluated as described in the next section.

Evaluation and Selection of Conservation Measures and Programs

As the next step in selecting viable conservation options for the District, Evaluation Criteria were developed and used to select a final set of conservation measures and programs for implementation. These Evaluation Criteria, which involved more detailed consideration, were applied to the items that were selected based on volume of water saved and cost per unit of water saved as discussed above, as well as one-time existing conservation programs and those of a qualitative nature. Evaluation Criteria range from very quantitative cost and water savings analyses to more subjective criteria such as overall public education benefits. The following criteria, listed in no particular order, were used to evaluate proposed water conservation activities:

Evaluation Criteria 1: Program Success

Measures and programs that currently exist and have proven effective have a good chance of continued success. It is often worth continuing to implement these measures and programs because they are already established from a logistical and administrative standpoint and due to the community's familiarity with them.

Evaluation Criteria 2: Potential Water Savings

Water savings are the ultimate goal of any water conservation program. Evaluating individual activities for water savings potential is essential in selecting those that are more appropriate for the District and will be implemented, particularly if they contribute to meeting the conservation goals presented in Section 5.

Evaluation Criteria 3: Cost Effective for the District and/or Customer

Considering the costs of measures and programs is an important evaluation tool. Cost savings are realized directly from implementing a measure or program. Additional savings are realized from decreased demands, including savings related to eliminating the need for additional water purchases, storage, treatment, and other infrastructure. Furthermore, the cost borne by the customer for any

conservation measure is an essential aspect to consider in assessing program effectiveness and acceptability to the community.

Evaluation Criteria 4: Feasibility of Implementation (technical or institutional)

Feasibility is another important criterion in evaluating conservation activities. An activity may appear to be a good candidate for implementation, but technical, legal, institutional, social, or other concerns may impede enactment of some measures and programs. Depending on the impediment, it may be appropriate to revisit measures that have been removed from consideration due to lack of feasibility at a future date.

Evaluation Criteria 5: Educational Benefits

Education is an important means of emphasizing the value of water conservation and providing citizens with the needed resources to select and implement specific conservation activities. The District relies upon educational activities as integral components of its water conservation Plan.

Evaluation Criteria 6: Best Practice

To provide a positive example for its customers and the larger community, water conservation measures and programs may be adopted because they are considered best practices. These activities may not be the most cost effective or possess easily measured water savings, but they demonstrate the District's commitment to promoting efficient water use and serve as an example to other water providers.

Evaluation Criteria 7: Community Expectations and Acceptance

Community acceptance is a key component of a successful water conservation Plan. Certain existing activities have value because the community expects and has grown accustomed to them. Other activities may be perceived as very positive by the community, and thus are more likely to be accepted.

Based on the Evaluation Criteria, water conservation measures and programs were selected for implementation, as listed in Table 7-16. Many of the proposed measures and programs remained after the District's screening and evaluation process. The District also selected several existing and new conservation activities for implementation, based upon a subjective analysis, as it would be difficult or impractical to quantify the water savings for many of these activities. The majority were selected because they have educational benefits, minimal costs, and either have been or can be easily implemented. Many are also considered best practices and demonstrate the District's commitment to water conservation.

Table 7-16: Total Water Savings, Evaluation and Selection Status of Conservation Measures and Programs

Water Conservation Measures and Programs	Existing Program Length	Estimated Annual Water Savings (as of 2008) due to Previous or Existing Programs (AF)	Estimated Annual Water Savings (as of 2015) due to Expanded or New Programs[1] (AF)	Total Estimated Annual Water Savings (by 2015) (AF)	Notes/ Assumptions	Evaluation Criteria Applied	Selected for Implementation
Water Efficient Fixtures/Appliances and Incentives							
Free Indoor Water Conservation Kits	1994 – present	20.9 AF	20.9 AF	41.8 AF	Assumes 50% installation rate.	1,2,3,5,6	√
New and Retrofit Fixture Incentives: Commercial	2008 – present	0.7 AF	6.6 AF	7.3 AF	More savings will be included in the calculations as purchases are made by the entities for the extra water efficient items or fixtures needed.	1,2,3,5,6	√
Indoor Retrofitting at District Facilities	One time (1997), but continues to provide water savings	0.8 AF	No additional annual water savings provided	0.8 AF	This program has been completed, although updates to fixtures will continue (likely not until after 2015). Also, any new buildings will have water efficient indoor and outdoor fixtures installed.	1,2,3	√
Toilet rebates – ultra-low flush and/or dual flush: Residential	N/A	N/A	3.4 AF	3.4 AF	20 new toilet rebates/year.	2,3,4,6,7	√
Urinal rebates – low-flow and/or waterless: Commercial	N/A	N/A	1.0 AF	1.0 AF	10 new urinal rebates/year.	2,3,4,6,7	
Appliance rebates – washing machines: Residential	N/A	N/A	3.7 AF	3.7 AF	20 new washing machine rebates/year.	2,3,4,6,7	
Tap fee incentives for new development	N/A	N/A	Unknown at this time	Unknown at this time	Water savings data will be calculated as the program is implemented.	2,3,4,5,6,7	√
Landscape Efficiency							
District Waterwise Landscaping and Demonstration Gardens	2005 – present	Unknown	Unknown at this time	Unknown at this time	Historical water savings unknown. Water savings will be calculated for any new facilities.	1,2,3,4,5,6,7	√

Water Conservation Measures and Programs	Existing Program Length	Estimated Annual Water Savings (as of 2008) due to Previous or Existing Programs (AF)	Estimated Annual Water Savings (as of 2015) due to Expanded or New Programs[1] (AF)	Total Estimated Annual Water Savings (by 2015) (AF)	Notes/ Assumptions	Evaluation Criteria Applied	Selected for Implementation
Landscape and Irrigation Audits: Residential/Commercial/HOA	2006	Advanced: 1.1 AF Basic: 2.0 AF	1.3 AF	4.4 AF	40 new zones to be audited per year in the future (Basic or Advanced)	1,2,3,5,6	√
Certification program/classes for landscape/irrigation professionals	1994 – present	Unknown	Unknown	Unknown	Historical and future water savings unknown; difficult to quantify water savings.	1,3,4,5,7	√
Free Outdoor Water Conservation Kits	N/A	N/A	Unknown	Unknown	Future water savings unknown; difficult to quantify water savings with items in outdoor conservation kit.	3,4,5,6,7	√
Vail Golf Course Irrigation System Replacement	N/A	N/A	Unknown	Unknown	See text below for explanation.	3	√
Rain Sensor Incentive	N/A	N/A	Unknown at this time	Unknown at this time	20 new sensors given out per year free of charge. Future water savings will be collected after implementation.	4,5,6,7	√
Evaluation of landscape and irrigation plans for new/ Redevelopment	N/A	N/A	Unknown	Unknown	Future water savings unknown; difficult to quantify water savings.	3,4,5,6,7	√
Industrial and Commercial Efficiency							
Tourist Industry	2004 – present	0.9 AF	1.9 AF	2.8 AF	Remaining 1,008 total bedrooms available for program implementation in Vail will be retrofitted the first year.	1,2,3,5,6	√
Lodging Sector Voluntary Conservation Programs	2004 – present	3.5 AF	No additional annual water savings provided	3.5 AF	Assume remaining 1,909 total bedrooms in Vail have private retrofit programs that have been implemented in full already.	2,5,6,7	√

Water Conservation Measures and Programs	Existing Program Length	Estimated Annual Water Savings (as of 2008) due to Previous or Existing Programs (AF)	Estimated Annual Water Savings (as of 2015) due to Expanded or New Programs[1] (AF)	Total Estimated Annual Water Savings (by 2015) (AF)	Notes/ Assumptions	Evaluation Criteria Applied	Selected for Implementation
Commercial and Industrial Water Conservation Education and Support	2003 – present	Unknown	Unknown	Unknown	Historical and future water savings unknown; difficult to quantify water savings.	4,5,7	√
Low-Flow Commercial Pre-Rinse Spray Washers	N/A	N/A	62.2 AF	62.2 AF	52 giveaways/year.	2,3,4,5,6,7	√
Education/Information Distribution							
Public Education	1994 – present	Unknown	Unknown	Unknown	Historical and future water savings unknown; difficult to quantify water savings.	1,5	√
Youth and Teacher Education	1991 – present; 2006 – present (Living Wise)	2.9 AF	8.0 AF	10.9 AF	Calculations for historical savings were based on Living Wise program data and assume a similar trend if participation in the Living Wise program continues in the future.	5	√
Indoor Water Audits	2008 – present	Unknown	Unknown at this time	Unknown at this time	Future water savings will be collected through other programs suggested from the audit (i.e., installation of water efficient fixtures or toilet rebate program).	1,2,3,5,6,7	√
Water Conservation Webpage	2003 – present	Unknown	Unknown	Unknown	Historical and future water savings unknown; difficult to quantify water savings.	1,5	√
Encouraging Water Conservation Through Water Rate Structures and Billing							
Water Rate Structure	2003 – present	Unknown	Unknown	Unknown	Historical and future water savings unknown; difficult to quantify water savings.	1,5	√
2008 Billing System Upgrade	2008 – present	Unknown	Unknown	Unknown	Historical and future water savings unknown; difficult to quantify water savings.	5,6	√

Water Conservation Measures and Programs	Existing Program Length	Estimated Annual Water Savings (as of 2008) due to Previous or Existing Programs (AF)	Estimated Annual Water Savings (as of 2015) due to Expanded or New Programs[1] (AF)	Total Estimated Annual Water Savings (by 2015) (AF)	Notes/ Assumptions	Evaluation Criteria Applied	Selected for Implementation
Uniformity Project	January 2009 – present	Unknown	Unknown	Unknown	Historical and future water savings unknown; difficult to quantify water savings.	1,3,4,5,6	√
Regulations/Ordinances							
District Water Use Regulations	1995 – present	Unknown	Unknown	Unknown	Historical and future water savings unknown; difficult to quantify water savings.	1,7	√
Collaborate with Land Use/Governmental Agencies	2003 – present	Unknown	Unknown	Unknown	Historical and future water savings unknown; difficult to quantify water savings.	4,5,7	√
Other Water Management Activities							
Water Conservation Officer Staff Position	1995 – present	Unknown	Unknown	Unknown	Historical and future water savings unknown; difficult to quantify water savings.	1	√
Water Reuse/Raw Water Systems							
Indirect Use of Effluent Return Flows (for Vail snowmaking)	1995 – present	100.0 AF	150.0 AF	150.0 AF	Total savings by 2015 only includes the use of effluent return flows component expected in 2015.	1,4,6,7	√
Treatment Facility Water Conservation/Efficiency Opportunities	1996 – present	36.8 AF	No additional annual water savings provided	36.8 AF	Water savings prior to 2008 unknown. Historical water savings is from one project in 2008. Calculations will be made as each project is implemented.	1,2,3	√

Water Conservation Measures and Programs	Existing Program Length	Estimated Annual Water Savings (as of 2008) due to Previous or Existing Programs (AF)	Estimated Annual Water Savings (as of 2015) due to Expanded or New Programs[1] (AF)	Total Estimated Annual Water Savings (by 2015) (AF)	Notes/ Assumptions	Evaluation Criteria Applied	Selected for Implementation
Distribution System Leak Identification and Repair							
System Maintenance, Leak Detection and Repair Program	1992 – present	46.5 AF	40.7 AF	87.2 AF	Historical water savings from data collected August 2006 – December 2008. Future water savings is based on 2008 data only. Average savings will be continually updated through 2015 as data become available.	1	√
Non-Revenue Water Committee	2004 – present	Unknown	Unknown at this time	Unknown at this time	Historical water savings unknown. Future water savings will be calculated as data become available.	1	√
Customer Service	2003 – present	4.3 AF	4.3 AF	8.6 AF	Historical and future water savings based on accounts that were given a one-time credit since ~2006 for high indoor residential use. Assume similar trend with credits will continue.	1	√
TOTAL QUANTIFIABLE ANNUAL WATER SAVINGS				**419.7 AF[2]**			

[1] Estimated annual water savings at end of 7 year timeframe (2015) includes cumulative effects of years 1 through 7. Appendix D contains detailed costs and water savings for each expanded or new measure and program with applicable data.
[2] Total water savings includes all Previous or Existing Programs, and only those Expanded or New Programs selected for implementation. These annual totals only include savings for programs that could be quantified with relative ease. Actual total savings are likely to be significantly higher.

While the Vail Golf Course Irrigation System Replacement program will not be evaluated any further as part of this Plan, the Vail Golf Course started a complete renovation of its irrigation system in spring 2009. The previous system was 40 years old and in need of upgrades. The new irrigation system will significantly increase the efficiency of water management. Vail Golf Club irrigates almost 100 acres of turf grass, and this program is mainly concerned with improving the agronomic conditions throughout the course. Any specific water savings will be calculated and compared to historical usage after the first season is complete and every year thereafter. Specific improvements being made are reducing overthrow, increasing the number of sprinkler heads, implementing tighter head spacing, and installing high density polyethylene (HDPE) pipe. HDPE pipe will drastically minimize leaks, especially during drought conditions and low stream flows. HDPE pipe is a very important factor in reducing water loss, as the fusing process replaces the current, weaker PVC glue or gasket fittings. New computer technology will be installed, allowing complete communication with the pumping system and the computer controls. Variations in flow and scheduled operating times will be linked alert staff of problems. This communication between the system and the staff is an advancement towards the efficiency of the irrigation system. The District greatly appreciates the detail and planning that that will ensure this project is as water efficient as possible.

The commercial urinal rebates and washing machine rebates were also removed from consideration. The District's service area has a very high turnover rate for commercial and residential property rebuilding and remodeling. The District anticipated that most high flow urinals and washing machines would be phased out within the next few years due to voluntary conservation programs; water savings from these rebate programs would likely have been realized anyhow.

As shown in Table 7-16, by implementing new activities and expanding existing water conservation measures and programs, the District can potentially save 420 AF per year by the year 2015. Note that this amount is the minimum savings possible because many programs and measures provide additional water savings that cannot be quantified to a reasonable degree. Therefore, the estimates presented in Table 7-16 are conservative in water savings estimates and also in program budgets. The District wants to determine how well the programs will be received by the community before committing more money to them year after year. For example, if the toilet rebate program is a great success with high demand for rebates, the District may consider expanding the program, thus providing additional water savings. However, for purposes of estimating water savings, it is assumed that the same program budget and number of rebates will be implemented from year to year.

Measures Reserved for Future Consideration

The evaluation process used to develop this Plan also identified several potentially feasible and cost effective conservation measures that could result in additional water savings. As discussed in this section, these programs and measures were not selected for implementation at this time due to public policy considerations and the need for additional information and analyses. These potential additional programs and measures will be reserved for further investigation and consideration in the future. Additional potential programs and measures that will remain on the list for future evaluation include the following:

- ET sensors and controllers; weather-based irrigation clocks
- Publication and distribution of ET data for irrigation scheduling; education on use of ET rate data
- Centralized ET irrigation control and computer system
- Establishment of a system of weather stations
- Real-time water use meter and monitor for loan to customers
- Mandatory separate metering for indoor and outdoor uses: Residential
- Best Management Practices for construction water use; incentives for developers and construction companies to use less water and minimize disturbance of areas that would then require revegetation
- Industrial, Commercial and Institutional (ICI) process recycling
- Mandatory separate metering for indoor and outdoor uses: Commercial and Mixed Use

SECTION 8 – IMPACTS OF PROPOSED CONSERVATION

Water Savings Estimates and Conservation Goals

The water conservation measures and programs selected for implementation described in Section 7 are estimated to provide approximately 420 AF of water savings by 2015. These savings will assist the District in achieving a 12% reduction in demands by 2015 (Water Conservation Goal #3, Section 5). However, the real savings provided from implementation of these programs could be higher or lower, depending on the accuracy of the water savings estimates and actual savings of measures and programs that could not be quantified to a reasonable degree. Due to the uncertainty with some of the water savings estimates, the District will evaluate and adjust these estimates if necessary, as part of its annual monitoring program.

Table 8-17 presents the water savings for existing programs that continue to provide water savings and the cumulative savings due to expanded or new programs from 2009 to 2015 that are expected from implementation of this Plan. Additionally, an estimate of further savings provided via landscape efficiency and information distribution programs is provided as 3% of the savings from quantifiable programs within those categories.

Table 8-17: 2009 – 2015 Estimated Water Savings for Existing and New/Expanded Programs

	Estimated Water Savings (AF)							
	2009	2010	2011	2012	2013	2014	2015	Total over 7 years
Existing Programs	220.2	230.2	240.2	250.2	260.2	265.2	270.2	1,736.4
Expanded/New Programs	60.7	75.2	91.1	105.6	120.1	134.6	149.1	736.4
Other programs (estimated):								
Landscape Efficiency	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
Education/Information Distribution	0.1	0.2	0.2	0.2	0.3	0.3	0.3	1.6
TOTAL	281.1	305.7	331.6	356.1	380.7	400.2	419.7	2,475.1
Percent of Annual Demand Saved	9.1%	9.8%	10.5%	11.0%	11.4%	11.7%	12.0%	

Figure 8-10 illustrates projected demands from 2009 to 2015 with and without the targeted water conservation savings specified in Water Conservation Goal 3. Over the seven years, the savings due to water conservation increase slightly as more programs are implemented and the influence of cumulative effects occur. With conservation, approximately 12% of annual projected demands are expected to be saved by 2015 assuming programs and measures are implemented as presented in this Plan.

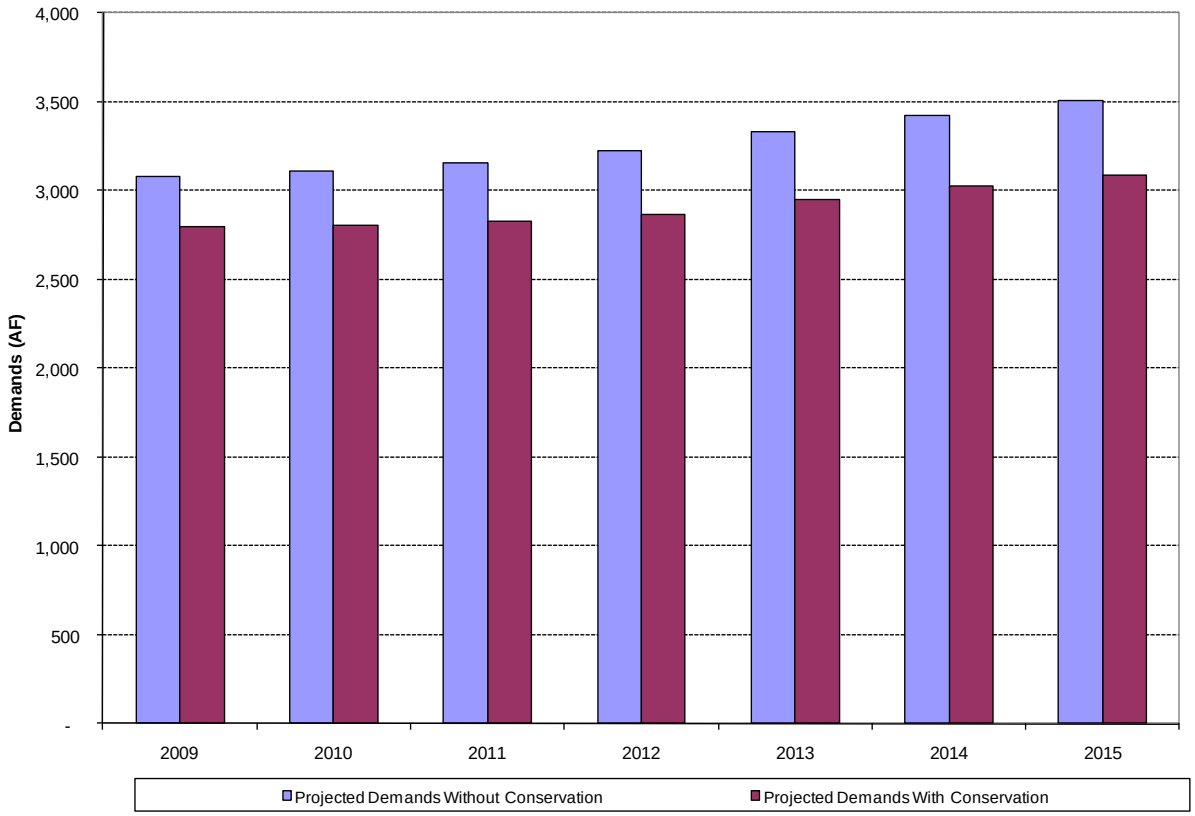

Figure 8-10: Projected Demands With and Without Conservation

Future Water Supply Planning

Conceptually, water conservation programs may result in cost savings due to decreased demands for water. Decreased demands may lead to cost savings in water treatment and may postpone, minimize, or eliminate the need for capital improvement projects. However, the implementation of this Plan is not expected to result in water savings sufficient to significantly decrease future capital improvement expenses within the District's service area. The District currently has sufficient water rights to meet water needs within its Vail service area. As development occurs within the District's Wolcott boundaries, developers will be required to dedicate water rights sufficient to serve proposed uses. Similarly, expansion of the Vail Service area, including zoning changes that could allow for higher density development, would require developers to dedicate ample water rights to provide for anticipated uses. The District does not expect water conservation measures to delay the purchase of additional water rights.

Potential Revenue Effects of Water Conservation

As the amount of water used by a customer decreases, the District receives less revenue from that customer. However, because the District's financial plan incorporates a water conservation savings component, any decreases in revenue resulting from lower demands are considered in planning initiatives and when evaluating potential system improvements and modifications. Additionally, the growing population and customer base in the area and the revenue they provide for the District is expected to balance any decreases in demand, and therefore revenue, resulting from water conservation savings.

As discussed in Sections 2 and 3, in 2003, the District adopted a rate structure with both a base fee per SFE and increasing tiered rates for the water usage component. This configuration has allowed for revenue stability through the base fees, while also encouraging a water conservation ethic without concern for the potential revenue impacts due to lower water demands. The District reviews capital expenditures, operational expenditures, projected revenues annually and would raise water rates only if it is necessary to meet future expenses.

SECTION 9 – IMPLEMENTATION, MONITORING AND EVALUATION PLAN

Implementation Schedule

Table 9-18 provides a preliminary schedule for the implementation and continuation of selected conservation measures and programs. The District will begin work on many of the new activities in 2009, though full implementation may not occur until late in the year. Some of the programs, such as the toilet rebate program and rain sensor incentive program will not be implemented until after 2009. The District's Water Conservation Officer will supervise and coordinate the actions needed for implementation of the selected conservation measures and programs.

Ongoing Public Involvement and Participation

The success of the District's Water Conservation Plan relies heavily on the customer involvement and response to the conservation measures and programs to be implemented through this Plan. The District will continue to engage the community through its public education program by posting water conservation information via billing inserts, billing messages, website information, and other opportunities to update and inform the public on water conservation matters. Monitoring results of the success and effectiveness of various measures and programs will be communicated to the public using these avenues.

Additionally, as part of the Water Conservation Plan preparation, the sub-groups that were formed out of the WCCAC meetings will continue to assist the District with implementing its water conservation measures and programs, particularly in areas relevant to their expertise and interests, including representatives the hotel Green Teams, landscape contractors, golf course superintendents, engineers, Eagle County representatives, and youth services.

Plan for Monitoring and Evaluation

As described in Section 5, one of the goals with this Plan is to establish a monitoring system that allows effective measurement of water conservation measures and programs annually. To allow for a more robust and accurate analysis of water conservation savings and costs when the Plan is updated, the District will document items including actual costs, estimated water savings, and customers affected when water conservation measures and programs are implemented. Gaps in existing data will be identified and the data collection program will be expanded as needed.

The Water Conservation Officer will develop an annual report of conservation activities, costs, and estimated savings for internal use and documentation. The report will include information on lessons learned, and requests and suggestions received from District residents, businesses, and others impacted by conservation activities. It will also document any modifications to measures and programs, noting the rationale behind suggested changes. Table 9-18 provides a tentative list of data and other information that will be collected for the conservation activities in this Plan, which will allow for a more streamlined evaluation process in the future.

Table 9-18: Implementation Schedule and Data Collection Plan for Water Conservation Measures and Programs

Water Conservation Measures and Programs	Required Action	Scheduled Start Year	Notes	Data Collection Activities
Water Efficient Fixtures/Appliances and Incentives				
Free Indoor Water Conservation Kits	▪ Continue to promote program and provide free kits	Existing	Successful ongoing program.	▪ Number of each fixture given away ▪ Water savings estimated from program ▪ Budget each year
New and Retrofit Fixture Incentives: Commercial	▪ Continue to work with commercial entities and promote this program	Existing	Implementation started in 2008 while working on the Plan; ongoing.	▪ Number of each fixture given away ▪ Number of each fixture ordered ▪ Customers requesting fixtures ▪ Estimated water savings ▪ Check actual savings by comparing a few accounts' historical and future usage records
Indoor Retrofitting at District Facilities	▪ Monitor fixtures and upgrade as necessary	Existing	Completed program, but still continues to provide savings.	▪ In new District buildings, track number and type of efficient fixtures installed and date ▪ Record any fixture upgrades made at existing facilities – number, type and date
Toilet rebates – ultra-low flush and/or dual flush: Residential	▪ Advertise Rebate program ▪ Set up detailed Standard Operating Procedure ▪ Start program	2014	If program is successful it will be implemented annually.	▪ Number of rebates ▪ Date replaced and age of replaced appliance ▪ Account type ▪ Costs
Tap fee incentives for new development	▪ Work with the Board and staff to determine program details ▪ Set up new meter sizing form	2015	The District may find that this program is not feasible. Discussing the details will help determine applicability.	▪ Create new meter sizing form ▪ Track customers who use the efficient meter sizing form versus the standard one ▪ Estimate usage by comparing the two forms for each account
Landscape Efficiency				
District Waterwise Landscaping and Demonstration Gardens	▪ As new District facilities are planned, ensure that this program is utilized ▪ Assist and partner with local facilities interested in this program	Existing	The District will be implementing this program as needed when new facilities are planned.	▪ Location of all Demonstration Gardens ▪ Track money spent by District
Landscape and Irrigation Audits: Residential/Commercial/HOA	▪ Contract with one to two certified auditors ▪ Advertise program ▪ Identify a few high usage accounts ▪ Schedule audits	2013	Education on over-irrigation will be a priority until coordination of this program with the UERWA can be implemented when their Plan is done. Will be an ongoing program if it proves to be successful.	▪ Audits completed (Basic/Advanced) by zone ▪ Estimated water savings from historical and future usage ▪ Customers

Water Conservation Measures and Programs	Required Action	Scheduled Start Year	Notes	Data Collection Activities
Certification program/classes for landscape/irrigation professionals	▪ Continue to partner with the Town of Vail and Eagle County to provide classes to local professionals	Existing	Create one training opportunity per year; ongoing.	▪ Training sessions offered ▪ Attendance
Free Outdoor Water Conservation Kits	▪ Purchase outdoor water conservation items -Advertise program to customers	Existing	Will be an ongoing program if it proves to be successful.	▪ Number of each fixture given away ▪ Budget spent
Rain Sensor Incentive	▪ Purchase rain sensors ▪ Advertise sensor give-away program	2013	There will be a specific budget for sensor give-away program each year.	▪ Number of sensors given away ▪ Estimated water savings ▪ Customers
Evaluation of landscape and irrigation plans for new/redevelopment	▪ Encourage irrigated area estimations be made, or if available, a landscape plan referenced prior to sizing new meters ▪ Require meter sizing form be filled out completely ▪ Hire a professional to evaluate landscape plans and make suggestions for better efficiency to correct poor design	2014	New staff will need to be hired or contracted to implement this program successfully.	▪ Number of plans that are efficient ▪ Number of plans with recommended changes ▪ Track selected water usage
Industrial and Commercial Efficiency				
Tourist Industry	▪ Complete the design of the District door hanger and table tents ▪ Distribute items to interested restaurants and hotels ▪ Educate the employees at each facility about the program	Existing	This ongoing program will replace the Project Planet items, with pamphlets that show the water provider sponsor.	▪ Number of participating hotels ▪ Number of participating restaurants ▪ Number of trainings completed ▪ Number of door hangers/table tents distributed
Lodging Sector Voluntary Conservation Programs	▪ N/A	Existing	Ongoing activity.	▪ Number of participating hotels ▪ Type of program implemented (linen reuse, water on demand, etc.)
Commercial and Industrial Water Conservation Education and Support	▪ Continue to maintain program	Existing	Ongoing program.	▪ Track meetings with different customers ▪ Track potential water efficient projects
Low-Flow Commercial Pre-Rinse Spray Washers	▪ Create list of restaurants and schools ▪ Purchase spray washers ▪ Distribute and install washers where needed	Existing	Program will end when all restaurants and school sprayers have been replaced.	▪ Number of sprayers installed ▪ List of restaurants/schools participating in program

Water Conservation Measures and Programs	Required Action	Scheduled Start Year	Notes	Data Collection Activities
Education/Information Distribution				
Public Education	▪ Continue to maintain	Existing	Ongoing program.	▪ Number of lectures ▪ Number of students/lecture
Youth and Teacher Education	▪ Continue to maintain	Existing	Ongoing program.	▪ Number of students participating in each program/year ▪ Number of teachers certified in Project WET
Indoor Water Audits	▪ Continue to maintain	Existing	Ongoing program.	▪ Number of indoor audits completed per year ▪ Other programs suggested, i.e., installation of water efficient fixtures or toilet rebate program
Water Conservation Webpage	▪ Continue to update	Existing	Ongoing program.	▪ Updated information
Encouraging Water Conservation Through Water Rate Structures and Billing				
Water Rate Structure	▪ Continue to maintain	Existing	Ongoing program.	▪ Billing Department will track these data
2008 Billing System Upgrade	▪ Continue to maintain	Existing	Ongoing program.	▪ Nothing to track
Uniformity Project	▪ Discuss process ▪ Start pilot program to measure program influence ▪ Present to District General Manager for approval ▪ Analyze all accounts for uniformity	Existing	This program has just begun and project size of the is currently being analyzed. Pilot program is being evaluated to define scope of project.	▪ Each account change ▪ Total SFE changes ▪ Total account status change
Regulations/Ordinances				
District Water Use Regulations	▪ Continue to implement	Existing	Ongoing program.	▪ Track annual changes as needed
Collaborate with Land Use/Governmental Agencies	▪ Maintain as opportunities arise	Existing	Ongoing program.	▪ Meeting dates, opportunities for partnership
Other Water Management Activities				
Water Conservation Officer Staff Position	▪ Continue to maintain staff	Existing	Ongoing position.	▪ N/A
Water Reuse/Raw Water Systems				
Indirect Use of Effluent Return Flows (for Vail snowmaking)	▪ N/A	Existing	Ongoing activity.	▪ Record snowmaking diversion amounts ▪ Continue to maintain gauging station
Treatment facility Water Conservation/ Efficiency Opportunities	▪ Continue to look for opportunities in the facilities and measure water savings	Existing	Ongoing program.	▪ Each water efficient project improvement by facility ▪ Estimated water savings
Distribution System Leak Identification and Repair				
System Maintenance, Leak Detection and Repair Program	▪ Continue to implement year round	Existing	Ongoing program.	▪ Leaks found each month ▪ Estimated water lost ▪ District cost
Non-Revenue Water Committee	▪ Continue to maintain	Existing	Ongoing program.	
Customer Service	▪ Continue to maintain	Existing	Ongoing program.	▪ One time credits ▪ Estimated water savings ▪ Cost of credit to District

Updates and Revisions to Water Conservation Plan

Colorado House Bill 04-1365 requires all water providers with annual demands of 2,000 AF or more to revise their conservation Plan at least every seven years. The District intends to fully review and update this Water Conservation Plan in 2014 in order to have an updated Plan on file by 2015 in compliance with State law. However, as described in Section 7, data on water conservation activities will be collected and evaluated on an annual basis. As a result, the District will most likely make modifications to measures and programs in order to maintain an effective water conservation program. Additionally, changes in technology, State and Federal laws, public perceptions, climatic conditions, and financial considerations, among others, may impact the District's Water Conservation Plan. The District will modify the Plan accordingly if it is found that significant changes warrant a revised conservation Plan prior to the seven-year update time period.

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APPENDIX A – CALCULATION OF WATER SAVINGS FOR CURRENT CONSERVATION MEASURES AND PROGRAMS

(Note: there may be a slight discrepancy with some calculation results due to rounding.)

Free indoor water conservation kits (all fixtures = 67% or 2/3 of flow rating)
Showerhead: (old showerhead flow (2.75 gpm) * 2/3) - (low flow showerhead (1.5 gpm) * 2/3) * 5.3 mins/person/day * 2.64 people/household * 365 days/year = 4,277.2 gallons saved/year/household for installation of efficient showerhead.
Kitchen aerator: (old kitchen aerator flow (2.5 gpm) * 2/3) - (low flow kitchen aerator (1.5 gpm) * 2/3) * 4.05 mins/person/day * 2.64 people/household * 365 days/year = 2,614.7 gallons saved/year/household for installation of efficient kitchen aerator.
Bathroom aerator: (old bathroom aerator flow (2.2 gpm) * 2/3) - (low flow bathroom aerator (1.0 gpm) * 2/3) * 4.05 mins/person/day * 2.64 people/household * 365 days/year = 3,137.7 gallons saved/year/household for installation of efficient bathroom aerator.
Tank bank: 0.8 gpf savings * 5.1 flushes/person/day * 2.64 people/household * 365 days/year = 3,931.5 gallons saved/year/household for tank bank installation.

Total savings (assume entire kit installed) = showerhead savings + kitchen aerator savings + bathroom aerator savings + tank bank savings * 50% installation rate * 65 kits/year = ***453,735 gallons saved per year for installation of 65 kits * 15 years of cumulative water savings = 54,448,175 gallons saved (1994 to 2009)***

New and Retrofit Fixture Incentives: Commercial (all fixtures = 67% or 2/3 of flow rating)
Showerhead: (old showerhead flow (2.75 gpm) * 2/3) - (low flow showerhead (1.5 gpm) * 2/3) * 5.3 mins/person/day * 1 person/unit * 50% room occupancy rate * 365 days/year = 810 gallons saved/year/unit for installation of efficient showerhead.
Kitchen aerator: (old kitchen aerator flow (2.5 gpm) * 2/3) - (low flow kitchen aerator (1.5 gpm) * 2/3) * 4.05 mins/person/day * 1 person/unit * 50% room occupancy rate * 365 days/year = 495 gallons saved/year/unit for installation of efficient kitchen aerator.
Bathroom aerator: (old bathroom aerator flow (2.2 gpm) * 2/3) - (low flow bathroom aerator (1.0 gpm) * 2/3) * 4.05 mins/person/day * 1 person/unit * 50% room occupancy rate * 365 days/year = 594 gallons saved/year/unit for installation of efficient bathroom aerator.
Tank bank: 0.8 gpf savings * 5.1 flushes/person/day * 1 person/unit * 50% room occupancy rate * 365 days/year = 745 gallons saved/year/unit for tank bank installation.

Total savings/year (based on actual 2008 data) = (showerhead savings * 127 installed in 2008 + kitchen aerator savings * 157 installed in 2008 + bathroom aerator savings * 164 installed in 2008 + tank bank * 107 installed in 2008) * 60% District participation = ***214,655 gallons saved per year for installation of Commercial kits***

Indoor retrofitting at District facilities (all fixtures = 67% or 2/3 of flow rating)
Toilets: 3.5 gpf to 1.6 gpf toilet - savings of 1,482 gallons per female for 260 workdays * 31 females at District facilities = 45,942 gallons saved/year with efficient toilet installation; savings of 494 gallons per male for 260 workdays * 54 males at District facilities = 26,676 gallons saved/year with efficient toilet installation
(savings from Table 2.4 Vickers 2001)
Urinals: 2.0 to 1.0 gpf urinal – savings of 520 gallons per male for 260 workdays * 54 males at District facilities = 28,080 gallons saved/year with efficient urinal installation
(savings from Table 2.10 Vickers 2001)
Kitchen and bathroom aerator: (old kitchen aerator flow (2.5 gpm) * 2/3 * 8.1 mins/person/day) - (low flow kitchen aerator (1.5 gpm) * 2/3 * 4.05 mins/person/day) – (low flow bathroom aerator (1.0 gpm) * 2/3 * 4.05 mins/person/day) * 85 people at District facilities * 260 days/year = 149,921 gallons saved/year for installation of efficient kitchen and bathroom aerators
Showerhead: (old showerhead flow (2.5 gpm) * 2/3) - (low flow showerhead (1.5 gpm) * 2/3) * 5.3 mins/person/day * 3 total showers/workday * 260 days/year = 2,770 gallons saved/year with efficient showerhead installation

Total savings/year = toilet savings (female) + toilet savings (male) + urinal savings + kitchen and bathroom aerator savings + showerhead savings = ***253,389 gallons saved per year for District retrofit program * 12 years water savings = 3,040,664 gallons saved (1997 to 2009)***

Landscape and irrigation audit program - Advanced
Advanced audit savings calculated by comparing all 8 accounts (38 zones) with Advanced audits completed in 2006 - 2007: Each account's 2007 monthly usage - Average monthly historical usage (2001-2006) = Advanced audit savings/account. 702,804 total savings for all accounts divided by2 year data collection period = ***351,402 gallons saved per year due to Advanced irrigation audits * 3 years water savings = 1,054,207 gallons saved (2006 to 2009)***

Landscape and irrigation audit program - Basic
Basic audit savings calculated by comparing all 7 accounts (125 zones) with Basic audits completed in 2006 - 2007: Each account's 2007 monthly usage - Average monthly historical usage (2001-2006) = Basic audit savings/account. 1,324,199 total savings for all accounts divided by2 year data collection period = ***662,100 gallons saved per year due to Basic irrigation audits* * 3 years *water savings* = 1,986,299 gallons saved (2006 to 2009)**

Signage and programs to encourage water conservation by guests at hotels, rental properties and restaurants (Tourist Industry)
Potential savings per room with linen reuse program: 600 gallons (from Project Planet savings calculator, assuming hotels have average 55% occupancy rate year round) * 462 rooms with Project Planet materials = ***277,200 gallons saved per year due to Project Planet materials * 5 years water savings = 1,386,000 gallons saved (2004 to 2009)***

Natural Retrofit
Potential savings per room with established non-District sponsored linen reuse program: 600 gallons (from Project Planet savings calculator, assuming hotels have average 55% occupancy rate year round) * 1,909 rooms with individually designed water conservation signage similar to Project Planet materials = ***1,145,400 gallons saved per year due to Natural Retrofit programs in Vail * 5 years water savings = 5,727,000 gallons saved (2004 to 2009)***

Youth education: Living Wise program savings (Youth and Teacher Education) all data came from Living Wise program calculations which show some different assumptions than above
Data from 2006 – 2007 Water Wise report:
Showerhead: (old showerhead flow (4.0 gpm)) - (Oxygenics showerhead (2.0 gpm)) * 8.0 mins/person/day * 2.5 people/household * 365 days/year * 36% installation rate = ***5,256 gallons saved/year/household for installation of Oxygenics showerhead.***
Kitchen aerator: (old kitchen aerator flow (2.5 gpm)) - (low flow kitchen aerator (1.5 gpm)) * 2.5 mins/person/day * 2.5 people/household * 365 days/year * 48% installation rate = ***1,095 gallons saved/year/household for installation of efficient kitchen aerator.***

Data from 2007 – 2008 Water Wise report:
Showerhead: (old showerhead flow (4.0 gpm)) - (Oxygenics showerhead (2.0 gpm)) * 8.0 mins/person/day * 2.5 people/household * 365 days/year * 47% installation rate = 6,862 gallons saved/year/household for installation of Oxygenics showerhead.
Kitchen aerator: (old kitchen aerator flow (2.5 gpm)) - (low flow kitchen aerator (1.5 gpm)) * 2.5 mins/person/day * 2.5 people/household * 365 days/year * 47% installation rate = ***1,072 gallons saved/year/household for installation of efficient kitchen aerator.***

Total savings/year (average of 2006-07 and 2007-08 programs) = ((showerhead savings + kitchen aerator savings * 181 participants * 50% District participants in 2006 – 2007) + (showerhead savings + kitchen aerator savings * 234 participants * 20% District participants in 2007 – 2008)/2 = ***473,043 gallons saved per year due to Living Wise program* * 2 years cumulative water savings = 1,419,128 gallons saved (2007 to 2008)**

Free high use water audits/Individual account leak detection (Customer Service)
Ran report on billing system to find the total amount of money reimbursed for one time credits over the past 3 years: $15,239 for one time credits / ($5.50 Tier three rate per 1000 gallons) * 3 years = 8,312,002 estimated gallons from leaks credited.
8,312,002,estimated gallons from leaks credited / 36 month data collection period * 12 months/year * 50% of accounts in District service area = ***1,385,334 gallons saved per year due to high water use audits/individual account leak detection program * 3 years water savings = 4,156,001 gallons saved (2006 to 2009 of reliable data program started in 2003)***

Indirect Use of Effluent Return Flows (for Vail snowmaking)
400 AF of water used for snowmaking on Vail Mountain. Effluent from Vail WWTP = 20% to 30% of the streamflow at the Gore Creek snowmaking intake. Indirect use of effluent return flows from the Vail WWTP = 80 to 120 AF, or 100 AF on average * 325,851 gallons/AF = ***32,585,100 gallons saved per year due to indirect use of effluent for Vail snowmaking operations * 14 years water savings = 456,191,400 gallons saved (1995 to 2009)***

Water and Wastewater Treatment Plant Efficiency (Treatment facility Water Conservation/Efficiency Opportunities)
(leaks due to old pump seals (2.0 gpm)) - water use for new pump seals (0.1 gpm) * 1,440 mins/day * 365 days/year = 998,640 gallons saved/pump * 12 pumps that run 24 hours/day that had seals replaced = ***11,983,680 gallons saved per year due to Water and Wastewater Treatment Plant Efficiency/Water Conservation * 1 year water savings = 11,983,680 gallons saved***

System maintenance, leak detection, and repair
Sum all estimated gallons lost from leaks (not line breaks) found from August 2006 to November December 2008 (from the lost water report): 34,060,600 gallons / (27 month data collection period / 12 months/year) = ***15,138,044 gallons saved per year due to leak detection and repair program * 2.25 years water savings = 34,060,600 gallons saved (program started in 1992 but the only reliable data for calculating savings was from Aug 2006 to December 2008)***

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APPENDIX B – COMPREHENSIVE LIST OF CONSERVATION MEASURES AND PROGRAMS

Table B-1 below presents the comprehensive list of conservation measures and programs identified and considered during development of this Plan and specifies whether an activity is (a) a currently existing measure, or (b) if it is a new measure or program or previously existing program that could potentially be implemented. The categorical headings included in the guidance document are used to group similar water conservation measures and programs. In addition, this list separates the conservation measures and programs into Demand-Side and Supply-Side, as described below:

Demand-Side Measures and Programs: Occur at the level of the water user, e.g., water customers or other authorized users such as municipal parks, and include actions that increase the technical efficiency of water use, using low water use toilets, for example; or choices that require less water such as replacing turf with Waterwise landscape.

Supply-Side Measures and Programs: Occur at the utility or district level and include system efficiency measures such as water distribution line leak repair or implementing use of effluent return flow systems.

Table B-1: Comprehensive List of Conservation Measures and Programs

Water Conservation Measures and Programs	Existing	Potential
Demand-Side		
Water Efficient Fixtures/Appliances and Incentives		
"Green House" option for new developments		x
Free indoor water conservation kits	x	
New and retrofit fixture incentives: Commercial	x	
Indoor retrofitting at District facilities	x	
Install waterless urinals at District facilities		x
Toilet rebates - ultra-low flush and/or dual flush (EPA WaterSense* labeled): Residential		x
Urinal rebates - low-flow and/or waterless (EPA WaterSense* labeled): Commercial		x
Appliance rebates - washing machines, dishwashers (EPA WaterSense* labeled): Residential		x
Collect old appliances and use for some other purpose		x
Tap fee incentives for new development		x
Tankless hot water heater rebates: Commercial		x
Water efficient fixtures		x
Rebate program for waterless urinal installation in select hotels and restaurants for demonstration/educational purposes and water use tracking		x
Encourage Green Building: rebates/incentives/vouchers to switch to/build with low water use fixtures/appliances		x
New and retrofit fixture rebates: Residential and/or Commercial		x
Landscape Efficiency		
Ordinances or encouraging use of appropriate plants, soil amendments, new irrigation systems, subsurface irrigation		x
District Waterwise landscaping and demonstration gardens	x	
Support and promote low water use landscaping at public facilities	x	
Landscape and irrigation audits: Residential/Commercial/HOA	x	
Efficient irrigation and Waterwise landscaping classes for homeowners/public	x	
CWCB auditors available at specific times		x
Certification program/classes for landscape/irrigation professionals	x	
Second home incentives to homeowners/landscapers/property managers		x
Free outdoor water conservation kits		x
Turf/high water use landscaping buy-back/incentive program		x
ET sensors/controllers; weather-based irrigation clocks		x
Publish/distribute ET data for irrigation scheduling; education on using ET rate data		x
Centralized ET irrigation control/computer system		x
Establish system of weather stations		x
Vail Golf Course irrigation system replacement		x

Water Conservation Measures and Programs	Existing	Potential
Irrigation through graywater systems; dual systems (raw/treated water); water storage		x
Homeowners Associations: landscaping water conservation program; encourage use of certified landscapers		x
Rain sensor incentive		x
Removal of phreatophytes		x
Route runoff to landscaped areas		x
Use of hybrid grass (e.g., as in Beaver Creek) that uses a lot less water		x
Landscape management		x
Educate people to water when they need to instead of by the watering schedule		x
Evaluation of landscape and irrigation plans for new/re-development		x
Industrial and Commercial Efficiency		
Tracking restaurant water use/largest users	x	
Signage and programs to encourage water conservation by guests at hotels, rental properties and restaurants (Water On Demand and Linen Reuse)	x	
Natural Retrofit	x	
Collaborate with hotel Green Teams		x
Low-flow Commercial pre-rinse spray washers		x
Vail Associates Snowmaking System Water Conservation Program	x	
Green Lodge pilot program; green room option		x
Commercial audits/consultations	x	
Collaborate with schools and municipalities to identify water saving opportunities		x
Community service opportunities for guests		x
Owner messaging/sales		x
Education/Information Distribution		
Community education	x	
Youth education	x	
District employee education	x	
Irrigation and Waterwise landscaping educational materials	x	
Free high use water audits/individual account leak detection	x	
Water conservation webpage	x	
Education geared towards Vail Chamber and Business Association		x
Teacher education		x
Hospitality/landscape/irrigation industry employee education and training		x
Wasting Water hotline		x
Real-time water use meter/monitor for loan		x
Raw water user education		x
Neighborhood volunteers to educate and distribute fixtures, etc.		x
Education via radio/news/stickers/branding/Farmers Market Booth	x	
Education for developers/new development		x
Remove barriers to conservation	x	
Water conservation communications	x	
Supply-Side		
Encouraging Water Conservation Through Water Rate Structures and Billing		
Inclining tiered water rate structure	x	
2008 billing system upgrade	x	
Billing message blocks/inserts	x	
Voluntary separate metering for indoor and outdoor uses and/or each unit in multi-family dwellings	x	
Mandatory separate metering for indoor and outdoor uses: Residential		x
Mandatory separate metering for indoor and outdoor uses: Commercial and Mixed Use		x
Acquire more data on water use/metering requirement by units		x
Decrease unbilled and non-revenue water	x	
Energy audits: water bill feedback		x
Uniformity project		x
Regulations/Ordinances		
District Water Use Regulations	x	
Meter and pay for construction water use	x	
Watering schedule changes	x	
New development regulations: maximum limits on irrigated areas and/or home size and/or number of fixtures; other building code requirements		x

Water Conservation Measures and Programs	Existing	Potential
Town of Vail regulation that only certified landscape and irrigation contractors would be able to work in the Town of Vail		x
Efficient irrigation technology/regulations: regulate the irrigation sector and landscape technology used		x
Retrofit/restoration ordinances		x
Best Management Practices for construction water use; incentives to developers/construction companies to use less water; minimize disturbed areas needing re-vegetation		x
Water budgets for new development		x
Land use regulation policies		x
Homeowners Associations: regulations on landscaping/turf area requirements		x
Other Water Management Activities		
Water Conservation Officer staff position	x	
Association memberships	x	
Collaborate with other entities to encourage Green Building and water efficient practices	x	
EverVail project		x
Water Reuse/Raw Water Systems		
Indirect Use of Effluent Return Flows (for Vail snowmaking)	x	
Water and Wastewater treatment plant efficiency	x	
ICI process recycling		x
Conversion to raw water irrigation supply for parks and open spaces	x	
Water budgets for raw water users		x
Distribution System Efficiency		
System maintenance, leak detection and repair program	x	
Meter replacement, testing, and maintenance program	x	
Non-Revenue Water Committee	x	
Water Auditor staff position		x

* WaterSense is a partnership program sponsored by the EPA that makes it easy for consumers to save water and protect the environment by looking for the WaterSense label to choose quality, water-efficient products (http://www.epa.gov/watersense/).

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APPENDIX C – INITIAL RANKING OF CONSERVATION MEASURES AND PROGRAMS

As discussed in Section 6, input from the WCCAC and the District's Management was solicited to perform an initial ranking of the comprehensive list of water conservation measures and programs. This methodology was used to remove potential activities from further consideration. Each measure and program was ranked according to the following scale:

0 – Combine with another measure or program
1 – Remove indefinitely
2 – Remove for the time being
3 – Interested, but needs more definition
4 – Interested, but needs more information
5 – Keep for further evaluation

Each individual measure or program that was eliminated from further evaluation after the initial ranking process and why it was not considered for further analysis is explained following Table C-1. Additionally, those measures that need more definition/information that will not be evaluated as part of this Plan, but will be at a future date, are also summarized below. The reasons for reserving measures for future evaluation include: the potential activity may require collaboration with outside entities which will extend beyond the timeframe for the development of this Plan, or the District may not wish to remove these activities from future consideration, but at the present time they cannot be adequately assessed without additional information. Where appropriate, it is suggested that information be collected for future evaluation.

As described in Table C-1, it should be noted that oftentimes a measure or program was combined with another or its core idea is already reflected in another measure or program.

Table C-1: Initial Ranking of Conservation Measures and Programs

Water Conservation Measures and Programs		Comments
Water Efficient Fixtures/Appliances and Incentives		
"Green House" option for new developments	0	Potential program included in the *Collaborate with land use/governmental agencies* program. See Appendix D for a description.
Free indoor water conservation kits	5	Existing activity. See Section 6 and Appendix D for a description.
New and retrofit fixture incentives: Commercial	5	Existing activity. See Section 6 and Appendix D for a description.
Indoor retrofitting at District facilities	5	Existing activity. See Section 6 for a description.
Install waterless urinals at District facilities	4	Potential program. See Section 7 for evaluation.
Toilet rebates – ultra-low flush and/or dual flush: Residential	4	Potential program. See Appendix D for a description.
Urinal rebates – low-flow and/or waterless: Commercial	4	Potential program. See Appendix D for a description.
Appliance rebates – washing machines, dishwashers: Residential	4	Potential program. See Appendix D for a description of washing machine rebates and Section 7 regarding evaluation of dishwasher rebates.
Collect old appliances and use for some other purpose	0	Potential activity considered under the various rebate programs.
Tap fee incentives for new development	3	Potential program. See Appendix D for a description.
Tankless hot water heater rebates: Commercial	2	Removed. See below for explanation.
Water efficient fixtures	0	General idea included under various rebate programs.
Rebate program for waterless urinal installation in select hotels and restaurants for demonstration/educational purposes and water use tracking	0	Potential program combined with the *Urinal rebates – low-flow and/or waterless: Residential and/or Commercial* program. See Appendix D for a description.

Water Conservation Measures and Programs		Comments
Encourage Green Building: rebates/incentives/vouchers to switch to/build with low water use fixtures/appliances	0	Potential program combined with other activities in the *Commercial and industrial water conservation education and support*, as well as *Collaborate with land use/governmental agencies* programs. See Appendix D for a description.
New and retrofit fixture rebates: Residential and/or Commercial	2	Removed. See below for explanation.
Landscape Efficiency		
Ordinances or encouraging use of appropriate plants, soil amendments, new irrigation systems, subsurface irrigation	0	Potential activity included in the *Turf/high water use landscaping buy-back/incentive* program. See Appendix D for a description.
District Waterwise landscaping and demonstration gardens	5	Existing activity. See Section 6 and Appendix D for a description.
Support and promote low water use landscaping at public facilities	0	Existing activity included in the *Commercial and industrial water conservation education and support* program. See Section 6 and Appendix D for a description.
Landscape and irrigation audits: Residential/Commercial/HOA	4	Existing activity. See Section 6 and Appendix D for a description.
Efficient irrigation and Waterwise landscaping classes for homeowners/public	0	Existing activity included in the *Public education* program. See Section 6 and Appendix D for a description.
CWCB auditors available at specific times	0	Potential program combined with the *Landscape and irrigation audits: Residential/Commercial/HOA* program. See Appendix D for a description.
Certification program/classes for landscape/irrigation professionals	4	Existing activity. See Section 6 and Appendix D for a description.
Second home incentives to homeowners/landscapers/property managers	2	Removed. See below for explanation.
Free outdoor water conservation kits	4	Potential program. See Appendix D for a description.
Turf/high water use landscaping buy-back/incentive program	3	Potential program. See Appendix D for a description.
ET sensors/controllers; weather-based irrigation clocks	3	Potential program included in the *Incentives: ET sensors/controllers; weather-based irrigation clocks* program. This program will not be evaluated as part of this Plan, but rather at a future date. See below for explanation.
Publish/distribute ET data for irrigation scheduling; education on using ET rate data	3	Potential program included in the *ET data: establish system of weather stations, centralized ET irrigation control/computer system; publish/distribute ET rates; education* program. This program will not be evaluated as part of this Plan, but rather at a future date. See below for explanation.
Centralized ET irrigation control/computer system	3	Potential program included in the *ET data: establish system of weather stations, centralized ET irrigation control/computer system; publish/distribute ET rates; education* program. This program will not be evaluated as part of this Plan, but rather at a future date. See below for explanation.
Establish system of weather stations	3	Potential program included in the *ET data: establish system of weather stations, centralized ET irrigation control/computer system; publish/distribute ET rates; education* program. This program will not be evaluated as part of this Plan, but rather at a future date. See below for explanation.
Vail Golf Course irrigation system replacement	5	Potential program. See Section 7 for explanation.
Irrigation through graywater systems; dual systems (raw/treated water); water storage	1	Removed. See below for explanation.

Water Conservation Measures and Programs		Comments
Homeowners Associations: landscaping water conservation program; encourage use of certified landscapers	1	Removed. See below for explanation.
Rain sensor incentive	4	Potential program. See Appendix D for a description.
Removal of phreatophytes	1	Removed. See below for explanation.
Route runoff to landscaped areas	0	Potential activity included in the *Collaborate with land use/governmental agencies* program. See Appendix D for a description.
Use of hybrid grass (e.g., as in Beaver Creek) that uses a lot less water	0	Potential activity included in the *Turf/high water use landscaping buy-back/incentive* program. See Appendix D for a description.
Landscape management	0	Potential activity included in the *Turf/high water use landscaping buy-back/incentive* and *Landscape and irrigation audits: Residential/Commercial/HOA* programs. See Appendix D for a description.
Educate/certify people to water when they need to instead of by the watering schedule. Education on landscaping required for certification.	1	Removed. Educational aspect included in the *Public education* program.
Evaluation of landscape and irrigation plans for new/re-development	3	Potential program. See Appendix D for a description.
Industrial and Commercial Efficiency		
Tracking restaurant water use/largest users	0	Type of activity is included in the *Customer service* program. See Appendix D for a description.
Signage and programs to encourage water conservation by guests at hotels, rental properties and restaurants (Water on Demand)	0	Existing activity included under the *Tourist industry* program. See Section 6 and Appendix D for a description.
Natural Retrofit	5	Existing activity. See Section 6 and Appendix D for a description.
Collaborate with hotel Green Teams	0	Existing activity included under the *Commercial and industrial water conservation education and suppor*t program. See Section 6 and Appendix D for a description.
Low-flow Commercial pre-rinse spray washers	4	Potential program. See Appendix D for a description.
Vail Associates Snowmaking System Water Conservation Program	5	Existing activity included in the *System maintenance, leak detection and repair* program. District owns part of the snowmaking water rights, so energy costs are the motivation. District will only provide leak detection support for the snowmaking system. See Section 6 and Appendix D for a description.
Green Lodge pilot program; green room option	0	Potential program combined with other activities in the *Commercial and industrial water conservation education and support* program. See Appendix D for a description.
Commercial audits/consultations	0	Existing activity. Indoor consultations are combined with other activities in the *Commercial and industrial water conservation education and support* program. Outdoor audits are included in the *Landscape and irrigation audits*: *Residential/Commercial/HOA* program. See Section 6 and Appendix D for a description.
Collaborate with schools and municipalities to identify water saving opportunities	0	Potential program combined with other activities in the *Commercial and industrial water conservation education and support* program. See Appendix D for a description.
Community service opportunities for guests	1	Removed. See below for explanation.
Owner messaging/sales	0	Included in the *Collaborate with land use/governmental agencies* program. See Appendix D for a description.

Water Conservation Measures and Programs		Comments
Education/Information Distribution		
Community education	0	Existing activity combined into the *Public education* program. See Section 6 and Appendix D for a description.
Youth education	5	Existing activity. See Section 6 and Appendix D for a description.
District employee education	5	Existing activity combined into the *Public education* program. See Section 6 and Appendix D for a description.
Irrigation and Waterwise landscaping educational materials	5	Existing activity combined into the *Public education* program. See Section 6 and Appendix D for a description.
Free high use water audits/individual account leak detection	5	Existing activity combined into the *Customer service* program. See Section 6 and Appendix D for a description.
Water conservation webpage	5	Existing activity. See Section 6 and Appendix D for a description.
Education geared towards Vail Chamber and Business Association	0	Potential program combined with other activities in the *Commercial and industrial water conservation education and support* program. See Appendix D for a description.
Teacher education	0	Potential program included in the *Youth and teacher education* program. See Appendix D for a description.
Hospitality/landscape/irrigation industry employee education and training	0	Potential program included in the *Tourist industry*, *Certification program/classes for landscape/irrigation professionals*, and *Commercial and industrial water conservation education and support* programs. See Appendix D for a description.
Wasting Water hotline	4	While there is not an official hotline set up, customers are aware that they can call the District to report cases where water is being wasted. In most cases, they talk directly with the Water Conservation Officer. Combined into the *Public education* program. See Appendix D for a description.
Real-time water use meter/monitor for loan	3	The real-time water use meter usage is a potential activity included in the *Non-Revenue Water Committee* program (see Appendix D for a description). The real-time water use meter/monitor for loan is a potential program that will not be evaluated as part of this Plan, but rather at a future date. See below for explanation.
Raw water user education	0	Potential program included in the *Conversion to raw water irrigation supply for parks and open spaces; education* program. See Section 7 for a description.
Neighborhood volunteers to educate and distribute fixtures, etc.	1	Removed. See below for explanation.
Education via radio/news/stickers/branding/Farmers Market Booth	0	This measure is included in multiple programs throughout the Plan.
Education for developers/new development	0	Combined with other activities in the *Commercial and industrial water conservation education and support* as well as *Collaborate with land use/governmental agencies* program. See Appendix D for a description.
Remove barriers to conservation	0	General idea included in overall goal of Plan.
Water conservation communications	0	General idea included in multiple programs throughout the Plan.
Encouraging Water Conservation Through Water Rate Structures and Billing		
Inclining tiered water rate structure	5	Existing activity included in the *Water rate structure* program. See Section 6 and Appendix D for a description.

Water Conservation Measures and Programs		Comments
2008 billing system upgrade	5	Existing activity. See Appendix D for a description.
Billing message blocks/inserts	4	Potential activity included in the *2008 billing system upgrade* program. See Appendix D for a description.
Voluntary separate metering for indoor and outdoor uses and/or each unit in multi-family dwellings	4	Existing activity included in the *Water rate structure* program. See Section 6 and Appendix D for a description.
Mandatory separate metering for indoor and outdoor uses: Residential	3	Potential program. This program will not be evaluated as part of this Plan, but rather at a future date. See below for explanation.
Mandatory separate metering for indoor and outdoor uses: Commercial and Mixed Use	4	Potential program. This program will not be evaluated as part of this Plan, but rather at a future date. See below for explanation.
Acquire more data on water use/metering requirement by units	0	Included in *Evaluation of landscape and irrigation plans for all new/re-development* program. See Appendix D for a description.
Decrease unbilled and non-revenue water	0	Existing activity incorporated in the *Non-Revenue Water Committee* program. See Section 6 and Appendix D for a description.
Energy audits: water bill feedback	1	Removed. See below for explanation.
Uniformity project	5	Potential program. See Appendix D for a description.
Regulations/Ordinances		
District Water Use Regulations	5	Existing activity. See Section 6 and Appendix D for a description.
Meter and pay for construction water use	0	Existing activity included in the *Water rate structure* program. See Section 6 and Appendix D for a description.
Watering schedule changes	0	Existing activity included in the *District Water Use Regulations* program. See Section 6 and Appendix D for a description.
New development regulations: maximum limits on irrigated areas and/or home size and/or number of fixtures; other building code requirements	0	Potential program included in the *Collaborate with land use/governmental agencies* program. See Appendix D for a description.
Town of Vail regulation that only certified landscape and irrigation contractors would be able to work in the Town of Vail	0	Potential program included in the *Collaborate with land use/governmental agencies* program. See Appendix D for a description.
Efficient irrigation technology/regulations: regulate the irrigation sector and landscape technology used	0	Potential program included in the *Collaborate with land use/governmental agencies* program. See Appendix D for a description.
Retrofit/restoration ordinances	0	Potential program included in the *Collaborate with land use/governmental agencies* program. See Appendix D for a description.
Best Management Practices for construction water use; incentives to developers/construction companies to use less water; minimize disturbed areas needing re-vegetation	3	Potential program. This program will not be evaluated as part of this Plan, but rather at a future date. See below for explanation.
Water budgets for new development	0	Included in the *Tap fee incentives for new development* program. See Appendix D for a description.
Land use regulation policies	0	Potential program included in *Collaborate with land use/governmental agencies* program. See Appendix D for a description.
Homeowners Associations: regulations on landscaping/turf area requirements	1	Removed. See below for explanation.
Other Water Management Activities		
Water Conservation Officer staff position	5	Existing position. See Section 6 for a description.
Association memberships	5	The District has existing memberships, but this program was removed from further analyses because the

Water Conservation Measures and Programs		Comments
		memberships are not considered a significant water conservation program on their own. The District will continue to have memberships with needed agencies, however.
Collaborate with other entities to encourage Green Building and water efficient practices	3	Existing activity combined with the *Collaborate with land use/governmental agencies* program. See Section 6 and Appendix D for a description.
EverVail project	1	Removed. See below for explanation.
Water Reuse/Raw Water Systems		
Indirect Use of Effluent Return Flows (for Vail snowmaking)	5	Existing activity. See Section 6 for a description.
Water and Wastewater treatment plant efficiency	5	Changed name to *Treatment facility water conservation/efficiency opportunities.* See Section 6 and Appendix D for a description.
ICI process recycling	3	Potential program. This program will not be evaluated as part of this Plan, but rather at a future date. See below for explanation.
Conversion to raw water irrigation supply for parks and open spaces	5	Existing activity. See Section 6 and 7 for a description.
Water budgets for raw water users	1	Removed. See below for explanation.
Distribution System Leak Identification and Repair		
System maintenance, leak detection and repair program	5	Existing activity. See Section 6 and Appendix D for a description.
Non-Revenue Water Committee	5	Existing activity See Section 6 and Appendix D for a description.
Water Auditor staff position	1	Removed. See below for explanation.

Initial Ranking 1: Measures and programs removed indefinitely

Irrigation through graywater systems; dual systems (raw/treated water); water storage: Graywater refers to the reuse of household wastewater excluding toilets (e.g., water from baths, showers, washing machines, and bathroom sinks), for irrigation and other water conservation applications. This measure is not appropriate for the District to implement or enforce because the use of graywater systems is not viable for most homeowners because the potential use, treatment and disposal of graywater is regulated by the State of Colorado and applicable county regulations. Surface applications of graywater require permitting either from the Colorado Department of Public Health and Environment or local health department because graywater and blackwater (toilet wastewater) is not currently separated in the applicable regulations. Monitoring may also be required depending upon the application of graywater. Health concerns due to pathogens, bacteria, and viruses exist in the legal use of graywater. Furthermore, under Colorado's prior appropriation doctrine, all rainwater must be allowed to flow downstream for those that hold the water rights to that water. Therefore, storing runoff in cisterns potentially injures downstream senior water rights holders.

Homeowners Associations: landscaping water conservation program; encourage use of certified landscapers: This measure would implement regulations on landscaping, require review of covenants for illegal turf grass/landscaping requirements, educate HOAs about any law changes regarding turf area requirements, and encourage use of certified landscapers. However, HOAs are not prevalent in Vail, therefore this measure would not result in significant water savings.

Removal of phreatophytes: Phreatophytes are plants which consume water from groundwater or surface water sources through uptake and subsequent evapotranspiration. These plants are often a concern along streams and rivers and may account for significant water loss. Phreatophytes, such as tamarisk, are not native and their removal can result in a significant

decrease in the volume of water taken up by plants. The District does not have significant non-native phreatophyte issues and therefore this measure is not applicable.

Educate/certify people to water when they need to instead of by the watering schedule. Education on landscaping required for certification: This program was removed because certification for different watering schedules would be too difficult to regulate for the District. This program might keep employees from enforcing the current watering schedule because certified people would make the process more complex. However, the efficient irrigation educational opportunities are still included in the *Public Education* program.

Community service opportunities for guests: This measure would provide hotel guests with an opportunity to become involved in local community service programs such as tree-plantings, trail restorations, and water conservation activities. However, this program is too broad and therefore does not help the District specifically achieve its water conservation goals.

Neighborhood volunteers to educate and distribute fixtures, etc: As part of this measure, volunteers could canvass their neighborhoods in an effort to educate residents about water conservation, water efficient fixtures, and Waterwise landscaping. This measure was removed because it would be too time consuming for the realized benefit.

Energy audits: *water bill feedback*: Although customers could receive information on their water bill regarding their individual energy efficiency related to water conservation, this measure was removed because it does not include water savings as its highest priority.

Homeowners Associations: regulations on landscaping/turf area requirements: Similar to the *Homeowners Associations: landscaping water conservation program; encourage use of certified landscapers* measure that would promote efficient landscaping on HOA-owned grounds, this measure was removed because HOAs are not prevalent in Vail. It would not result in significant water savings and some HOAs have similar rules in place but may or may not readily enforce these rules.

EverVail project: The EverVail project is an 11-acre development near West Lionshead that is currently in the planning stages. This project incorporates sustainable practices at all levels of design including water efficiency not only with the completed project, but during the construction phase. Although this is a good example of a private industry project that the District could work with when development starts, it was removed from further analyses because it is not specifically the District's project.

Water budgets for raw water users: Although the use of raw water can save on water treatment and energy costs, this type of measure does not tend to conserve water as people are likely to use more because it is cheaper. With each individual raw water system being different and complex, some have the capability of switching between raw and treated water when needed. The District evaluates each system separately and determines what water rate structure should be applied based on the circumstances. Some raw water rate systems are structured with tiered irrigation rates, capital recovery rates, or special rates created specifically for that system. If any system switches to treated water usage, the normal tiered rates apply. Because the District will continue to evaluate each raw water system separately and apply tiered rates where needed, which act as water budgets themselves, this measure was removed from further analysis.

Water Auditor staff position: In the mid-1990s the District created a Water Auditor position to help manage system losses. The Water Auditor was to perform regular audits on the District's water system and to determine ways to identify non-revenue water. However, the water auditor position no longer exists; therefore, the NRWC has taken over the water auditor duties as lost water can be better identified through discussions with multiple departments. The Raw Water Resources Operator keeps track of all leaks found in the system, water lost via tank overflow and system usage, and overall system water loss.

Initial Ranking 2: Measures and programs removed for the time being
Tankless hot water heater rebates: *Commercial*: Tankless hot water heaters provide hot water only when it is needed by heating water directly without the use of a storage tank. An electric element or gas burner heats the water, thus providing for an endless supply of hot water. However, a 3-circuit electrical system is needed for installation, and many older residential units in Vail do not have this. Some models also require extra parts to be installed to ensure optimal operational performance at high elevations. These units primarily conserve more energy than water and therefore this measure was removed from further consideration.

New and retrofit fixture rebates: Residential and/or Commercial: *A* specific rebate program for residential and commercial fixtures will not be done because many items are already given out for free with the indoor water conservation kits. The District prefers to focus on the successful give-away program rather than on a commercial fixture incentive program. Hotels or condominium associations interested in placing bulk orders at cost for items contained in the indoor water conservation kits may do so through the District. If they desire quantities less than 50 for each item, they may obtain them directly from the District free of charge.

Second home incentives to homeowners/landscapers/property managers: This measure would reward homeowners, landscapers, and property managers for implementing water conservation activities related to indoor and outdoor use. It could involve golf or ski passes, discounts at local merchants, cash, etc. However, in the past, the District has found that reward programs for water savings is not useful because people that waste the most water end up winning. Even with the savings, they are still using more water than others. This measure is therefore not feasible. It is better to focus on education and to keep the common goal of water savings at the forefront.

Initial Ranking 3: Measures and programs needing more definition
ET sensors/controllers; weather-based irrigation clocks: This program has potential to be on the list for further evaluation after this Plan. While the program has merit, it needs better definition and evaluation due to the variety of directions it could take such as a rebate program, incentive program, or becoming a requirement for irrigation systems. In summary, ET controllers use real time climate data to estimate current crop water needs (in this case, turf and/or other landscape plants), whereas most irrigation systems use a timer where the user pre-sets irrigation times and water periods. Many timers allow for programming changes throughout the irrigation season, with more water being applied mid-summer and less in the fall, for example. Irrigation systems are usually programmed to apply more water than landscaping actually needs. A weather-based irrigation clock would increase landscape efficiency by assessing watering needs based on recent weather patterns.

Publish/distribute ET data for irrigation scheduling; education on using ET rate data: This is an activity that the District implemented in the past that was not successful because the public was not educated on the use of ET data. ET data can be relied upon to determine the proper amount of water required for plants and soils, which can vary by plant, time of year, and weather. This program has potential if more education is offered on the use of the data and therefore it will be further evaluated after this Plan. ET rates and watering guidelines could be distributed via the District's website, radio announcements, The Vail Daily newspaper, and local television stations. Education of the community would be an important component of this measure to ensure effective use of the ET data.

Centralized ET irrigation control/computer system: To provide useful ET data, a centralized computer system would need to be established for customers to access. Due to the potential costs and logistics of implementing such a system, this program will be on the list for further evaluation after this Plan.

Establish system of weather stations: In order to distribute ET data, allow for effective use of ET sensors/controllers, and utilize a centralized ET irrigation control system, a network of weather stations would need to be established. The District could set up a system of weather stations and possibly partner with other agencies for purposes of calculating ET requirements of

representative local landscapes based on recent weather. Similar to the other ET programs discussed above, this program will also be on the list for further evaluation after this Plan due to the complexity and potential costs of executing it.

Real-time water use meter/monitor for loan: The real-time water use meter/monitor for loan is a potential program that will be further evaluated after this Plan. It is a meter that could be loaned out to District customers that shows actual usage when appliances are running, e.g., if a customer is doing a load of laundry and no other water is running, they would be able to see how much water is being used by the washing machine in real-time. The unit will also tell the customer how much water is used in one day.

Mandatory separate metering for indoor and outdoor uses: Residential: While making separate meters for indoor and outdoor uses mandatory would allow for easier inspection and tracking of the two types of usage, this measure would increase costs to the District due to the additional meters they would have to maintain and account for in terms of maintenance, manpower and accounting costs. However, this program will remain on the list for further evaluation after this Plan because it still has value.

Best Management Practices for construction water use; incentives to developers/construction companies to use less water; minimize disturbed areas needing re-vegetation: Implementing measures and incentives for the construction industry to increase water conservation efforts such as minimizing water used for site dust control and line flushing, and reducing water used to reclaim vegetated areas by decreasing disturbed areas could be very beneficial given the amount of re-development occurring in the Vail area. However, due to the broad nature and potential regulatory aspect of this measure, it will be on the list for further evaluation after this Plan.

ICI process recycling: Water reuse or recycling at certain ICI locations such as healthcare facilities, car washes, or food processing and manufacturing sites can present significant opportunities for water conservation. These may include using rinse water in cooling towers, modifying manufacturing processes to consume less water, or using gray water at car washes. This program will remain on the list for further evaluation after this Plan is completed.

Initial Ranking 4: Measures and programs needing more information
Mandatory separate metering for indoor and outdoor uses: Commercial and Mixed Use: Similar to the mandatory separate metering for indoor and outdoor uses for Residential accounts, this measure will not be evaluated as part of this Plan, but rather at a future date. It does, however, have more priority than the mandatory separate metering program for Residential accounts because of the smaller number of accounts and therefore less cost associated with purchasing additional meters. As such, it was assigned a 4 rather than a 3 in the initial ranking exercise.

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APPENDIX D – SUMMARY INFORMATION FOR EVALUATED CONSERVATION MEASURES AND PROGRAMS

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Table D-1: Detailed Costs and Water Savings of Conservation Measures and Programs

Water Conservation Measures and Programs	Scheduled Start Year	Number of Units (ongoing or one-time)	Estimated Annual (or one-time) Costs	Estimated Year 1 Annual Water Savings (gallons)	Estimated Year 7 Annual Water Savings (gallons)	Total over Seven-Year Time Period (2009 – 2015)			
						Total Estimated Cost[1] ($)	Total Estimated Water Savings (gallons)	Cost per 1,000 units water saved ($/1,000 gallons)	Cost per AF water saved ($/AF)
Water Efficient Fixtures/Appliances and Incentives									
Free Indoor Water Conservation Kits	Existing	139 kits (ongoing)	$2,000	972,897	6,810,278	$14,000	27,241,113	$1.00	$167.00
New and Retrofit Fixture Incentives: Commercial	Existing	3 sets of 50 kits (ongoing)	$1,500	307,038	2,149,266	$10,500	8,597,066	$1.00	$398.00
Indoor Retrofitting at District Facilities	Existing	N/A (one-time)	$33,407	253,389	253,389	$33,407	1,773,721*	$19.00	$6,137.00
Toilet rebates – ultra-low flush and/or dual flush: Residential	2010	20 rebates (ongoing)	$1,500	186,746	1,120,474	$9,000	3,921,659	$2.00	$748.00+
Urinal rebates – low-flow and/or waterless: Commercial	N/A (not selected for implementation)	10 rebates (ongoing)	$500	46,000	322,000	$3,500	1,288,000	$3.00	$885.00
Appliance rebates – washing machines: Residential	N/A (not selected for implementation)	20 rebates (ongoing)	$1,500	172,089	1,204,621	$10,500	4,818,484	$2.00	$710.00
Landscape Efficiency									
Landscape and Irrigation Audits: Residential/Commercial/HOA	2011	40 zones (ongoing)	$2,000	423,744	423,744	$10,000	2,118,718*	$5.00	$1,538.00
Industrial and Commercial Efficiency									
Tourist Industry	Existing	1,008 rooms (one-time)	$1,767	604,800	604,800	$1,767	4,233,600*	$0.40	$136.00
Natural Retrofit	Existing	1,909 rooms (one-time)	N/A	1,145,400	1,145,400	N/A	8,017,800*	N/A	N/A
Low-Flow Commercial Pre-Rinse Spray Washers	2009	52 sprayers (ongoing)	$1,500	2,893,800	20,256,600	$10,500	81,026,400	$0.10	$42.00
Education/Information Distribution									
Youth and Teacher Education	Existing	47 kits (ongoing)	$4,563	371,320	2,599,240	$31,941	10,396,959	$3.00	$1,001.00
Water Reuse/Raw Water Systems									
Indirect Use of Effluent Return Flows (for Vail Snowmaking)	Existing	N/A (ongoing)	N/A	32,585,100	48,877,650	N/A	291,636,645*	N/A	N/A
Treatment Facility Water Conservation/Efficiency Opportunities	Existing	19 pump seals (one-time)	$12,141	11,983,680	11,983,680	$12,141	83,885,760*	$0.10	$47.00
Distribution System Leak Identification and Repair									
System Maintenance, Leak Detection and Repair Program	Existing	N/A (ongoing)	$3,100	13,250,000	13,250,000	$21,700	92,750,000*	$0.20	$76.00
Customer Service	Existing	N/A	$15,239	1,385,334	1,385,334	$106,671	9,697,335*	$11.00	$3,584.00

[1] Costs do not include existing staff time or marketing costs; assumes constant rate of implementation each year except Indoor Retrofitting at District Facilities, Tourist Industry, Natural Retrofit, and Treatment Facility Water Conservation/Efficiency Opportunities programs.

***** Water savings not cumulative: Indoor Retrofitting - program completed for time being, fixtures not likely to be updated until after 2015; Landscape and Irrigation Audits - assuming audit suggestions do not necessarily stay in place year after year, therefore watering schedules may be changed each following year; Tourist Industry - assume all remaining rooms would be retrofitted in first year; Natural Retrofit - remaining 1,909 bedrooms in Vail have private retrofit programs that have been implemented in full already; Indirect Use of Effluent Return Flows (for Vail Snowmaking) - savings do not carry over from year to year; Treatment Facility Water Conservation/Efficiency Opportunities - pump seal replacement is one-time; System Maintenance, Leak Detection and Repair Program - system sounded each year, leaks would not go undetected for more than one year as a result; Customer Service - similar to leak detection, accounts are checked periodically and therefore the maximum time period high usage would go undetected is one year.

[+] Cost per AF water saved is different than value presented in Table 7-2 because program will be implemented at a later time, i.e., not implemented over the full 7 years as the single unit comparison in Table 7-2 assumes

APPENDIX E – 30-DAY PUBLIC COMMENT PERIOD RESOLUTION

December 18, 2007:

Excerpt from Eagle River Water & Sanitation District Minutes of December 18, 2007 Board Meeting

REPORT BY GENERAL MANAGER

Water Conservation Plan – Ms. Johnson reviewed the background of House Bill 04-1365 which updated the "Water Conservation Act of 1991" and provides support for water planning by retail water providers. She noted that the District assisted Hydrosphere in preparing a grant application requesting $41,370 for the purposes of developing a new plan. Preliminary response from the Colorado Water Conservation Board is they will fund the request in full. Ms. Johnson stated that The Act requires each "covered entity" to make the revised draft water conservation plan available for public review and comment for a period of not less than sixty days, unless the entity has other policies. She presented her request, a copy of which is attached as **Exhibit O** and incorporated herein by this reference, asking the board to adopt a policy setting forth as the District's practice that draft plans available for public review and comment be subject to a 30 day review period. The board discussed the time available to develop a new plan in relation to the CWCB's grant cycle, and upon motion duly made and seconded it was unanimously

RESOLVED to adopt a 30-day review period for public review and comment of the Draft Water Conservation Plan as drafted by Counsel.

January 26, 2012

Excerpt from Eagle River Water & Sanitation District Minutes of Board Meeting

REPORT BY GENERAL MANAGER

Water Conservation Plan – Ms. Fleury and Mr. Weaver presented the draft 2009–2015 Water Conservation Plan and related Board Action Request Form, copies of which is attached hereto as **Exhibit R** and **S**, respectively, and incorporated herein by this reference. They explained that the Plan's formation was mandated by the Colorado Water Conservation Board (CWCB). The Board approved a 30-day public comment period for the Plan, after which revisions may be incorporated and the Plan formally approved by the Board and submitted in final form to the CWCB.

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APPENDIX F – PUBLIC NOTICES

May 27, 2008
Vail Daily News Brief regarding WaterWise Wednesday Community Forum

Printable

Vail Daily

Vail Valley: Water-conservation ideas wanted

May, 27 2008
Daily Staff Report
Vail, CO Colorado

EAGLE COUNTY, Colorado – Residents can share their ideas about conservation with the local water supplier at this month's Waterwise Wednesday session at the Avon Public Library from 5:30 p.m. to 7 p.m., Wednesday.

The Eagle River Water and Sanitation District is now developing a water-conservation plan and wants to update residents. District represents will give examples of other water-conservation efforts in Colorado.

"We want to engage the community throughout the plan's development" said Sarah Fleury, the district's water conservation officer. "Public acceptance and implementation of conservation measures will directly contribute to the Plan's overall success."

The monthly Waterwise Wednesdays are sponsored by the Eagle River Watershed Council, a watchdog group.

For more information on Wednesday night's meeting, contact Johnson at (970)477-5457.

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http://www.vaildaily.com/apps/pbcs.dll/article?AID=/20080527/NEWS/375772968parentprofile=search&template=printart

:

Eagle River Water and Sanitation District Billing Statement Messages: September, October November of 2011; February 2012; Example shown below.

Eagle River Water & Sanitation District
www.erwsd.org

Customer-Account #	Bill Number	Billing Date	Due Date
[redacted]	[redacted]	02/03/2012	02/20/2012

Previous Balance	$93.43CR
Payments	$62.89CR
Credits / Adjustments	$0.00
Balance Forward	$156.32CR
Current Charges	$59.29
Total Bill Amount	$97.03CR

Credit Balance Do Not Pay

Customer Service? To speak to a customer service representative please call 970-477-5451 Monday through Friday, 8:00am to 5:00pm MST/MDT.

Email Questions? customerservice@erwsd.org

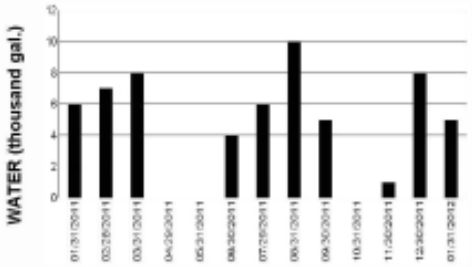
Written Correspondence?
ERW&SD
Attn: Customer Service
848 Forest Rd
Vail, CO 81657

Regular Bill

Customer: [redacted] Service Address: [redacted]

Service	Meter #	Prev. Read Date	Prev. Read	Curr. Read Date	Curr. Read	Days Billed	Usage	Units	SFE
Water	[redacted]	12/30/2011	366	01/31/2012	371	32	5,000	GAL	1.00

Description	Usage	$ Amount
WATER		
Vail - Water Base Service Rate		$14.02
Vail - Water Usage Tier 1	5,000	$10.60
Vail - Water Debt Service Rate		$7.27
SEWER		
Sewer - Use Rate		$24.35
Sewer - Debt Service Rate		$3.05
Total Current Charges		**$59.29**
Previous Balance		$93.43CR
Payment - Check		$62.89CR
Balance Forward		**$156.32CR**
Total Amount Due		**$97.03CR**



WHAT'S YOUR ANNUAL WATER USE? - Compare your monthly water use in the chart above. Each month should be similar, except for summer months with outdoor irrigation. High use could indicate a leak.

WATER CONSERVATION PLAN REVIEW: To review the draft Water Conservation Plan, go to www.erwsd.org or call the Water Conservation Officer at 970-477-5426. Public comments can be made through March 7.
KEEP FIRE HYDRANTS CLEAR OF SNOW/OBSTRUCTIONS: Snow removal activities must not block access to hydrants so firefighters can easily reach them. Prevent delay during an emergency. Call 970-477-5473.

ACCOUNT IS SUBJECT TO A 1% FINANCE CHARGE IF PAYMENT IS NOT RECEIVED WITHIN 25 DAYS OF THE BILLING DATE

Return this portion with your payment. Allow five days by mail.

Eagle River Water & Sanitation District
848 Forest Road Vail, Colorado 81657

Make Checks Payable to: Eagle River Water and Sanitation District

☐ Check here if your address information has changed.
Please indicate changes on the back of this page.

Customer-Account #	Due Date
[redacted]	02/20/2012
Amount Due ($)	$97.03CR
	Credit Balance Do Not Pay
Amount Enclosed:	

[redacted]

REMIT PAYMENT TO:

EAGLE RIVER WATER & SANITATION DISTRICT
DEPT 2245
DENVER CO 80271-2245

1

151318008483000000009703201202200

Eagle River Water and Sanitation District website: Posted January 31, 2012

ERWSD Draft Water Conservation Plan Available

House Bill 04-1365 relates to water planning by retail water providers and made grant funds available for development of new water conservation plans. The Act required that water conservation plans be completed by water providers supplying a minimum of 2,000 acre feet of water per year. The Eagle River Water & Sanitation District (District) applied for funds and was granted $41,370 from the CWCB on January 15, 2008, to develop an updated Water Conservation Plan. The District has completed the revised 2009 – 2015 Water Conservation Plan (Plan) with the contracted technical assistance of AMEC Earth & Environmental, Inc. and Leonard Rice Engineers, Inc.

A revised draft of the Plan and was presented to the Board of Directors at the District's January 26, 2012, meeting. The Board approved a 30-day public comment period; all applicable comments will be incorporated into the revised draft Plan prior to its posting for public review (as required under House Bill 04-1365, which created the grant program for funding for water conservation planning and implementation). Public comments will be incorporated into the Plan prior to its submittal for acceptance by the CWCB.

The draft Plan is available for public review at the following locations:

ERWSD Vail Office: 846 Forest Road, Vail, CO 81657
Avon Public Library: 200 Benchmark Road, Avon, CO 81620
Vail Public Library: 292 W. Meadow Drive, Vail, CO 81657

Questions or comments should be directed to Sarah Fleury, Water Conservation Officer, at 970.477.5426 or sfleury@erwsd.org.

February 14, 2012

Vail Daily News Brief regarding Availability of Draft Water Conservation Plan for Review

VAIL

Water plan up for review

The draft Eagle River Water & Sanitation District Water Conservation Plan is available for review. The draft plan was posted on the District website, www.erwsd.org, and made available locally the week of Jan. 30.

Community members can access the draft plan at the Vail and Avon public libraries and at the Eagle River Water & Sanitation District office in Vail. ERWSD customers were notified on their Feb. 3 billing statements that the draft plan was available for review and input. The draft plan applies to the water-service area of Eagle River Water & Sanitation District, roughly East Vail to Dowd Junction plus certain Wolcott areas.

Comments on the draft Plan may be submitted to District Water Conservation Officer Sarah Fleury through March 7. Contact Fleury by phone at 970-477-5426, email at sfleury@erwsd.org, in person or mail at 846 Forest Road, Vail, CO 81657. All comments will be considered for integration into the final plan and will be noted in a plan appendix.

The District will submit the plan to the CWCB after considering all comments received. The CWCB will accept the Plan once it determines that the plan meets state guidelines.

For more information, go to www.erwsd.org or contact Fleury at 970-477-5426.

APPENDIX G – PUBLIC COMMENTS

Eagle River
Watershed Council, Inc.

Advocates for our rivers

Ms. Linn Brooks
Eagle River Water and Sanitation District
846 Forest Road
Vail, CO 81657-5075

February 23, 2012

Dear Linn,

The purpose of this letter is to express the support of the Eagle River Watershed Council (ERWC) for the Eagle River Water and Sanitation District's (ERWSD) Draft Water Conservation Plan.

ERWC advocates for the health and conservation of the Eagle and Upper Colorado River basins through research, education and Projects. Our vision is of clear mountain streams that provide good quality water in ample quantity for a self-sustaining healthy fish population and efficient use by humans.

ERWSD's Conservation Plan is supportive of our mission and vision in that the "fundamental resource conservation principles underlying the District's water management and conservation goals are driven by the need to protect streamflows and water quality in Gore Creek and the Eagle River." These streamflows and water quality are essential not only to providing safe water for household use but are also essential to the health of our streams' aquatic inhabitants and riparian corridors. Our community's resort economy utilizes these waters for fishing, snowmaking, kayaking, rafting, and enhancement of the quality of life Vail residents expect.

While we recognize that the District is in business to deliver water to customers in return for revenues, we respect their partnership with us and the community in conserving this precious natural resource for the benefit of all.

ERWC realizes the importance of water conservation and, in 2008, held one of our monthly educational public forums, called Water Wise Wednesdays, to have ERWSD staff present a Plan overview, which included a discussion of existing and proposed water conservation measures. Attendees provided feedback on the conservation measures and ranked them based on their anticipated participation level.

We expect that ERWSD will realize economic benefits from this plan related to reduced costs of pumping, water and wastewater treatment, and other operational efficiencies which make conservation a good business practice. Their proactive, itemized approach to conservation will benefit ERWSD, the community and our streams and rivers.

Best Regards,

Susan Pollack, President
Eagle River Watershed Council

Melissa Macdonald, Executive Director
Eagle River Watershed Council

P.O. Box 7688 Avon, CO 81620 Phone (970) 827-5406
A community supported 501 (c)3 nonprofit organization
www.eagleriverwatershedcouncil.org

APPENDIX H – REFERENCES

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