

STATE OF COLORADO

Colorado Water Conservation Board Department of Natural Resources

1313 Sherman Street, Room 721
Denver, Colorado 80203
Phone: (303) 866-3441
Fax: (303) 866-4474
www.cwcb.state.co.us



TO: Colorado Water Conservation Board Members

FROM: Veva Deheza
Kevin Reidy, Water Conservation Technical Specialist
Office of Water Conservation & Drought Planning

John W. Hickenlooper
Governor

Mike King
DNR Executive Director

Jennifer L. Gimbel
CWCB Director

DATE: July 18, 2012

SUBJECT: **Agenda Item #25, July 17-18, 2012 Board Meeting**
DRAFT Water Efficiency Plan Guidance Document and Template

Staff Recommendation: Staff recommends final adoption of the 2012 CWCB *Water Efficiency Plan Guidance Document and Template*.

Scope of the Revised Water Efficiency Plan Guidance Document

The DRAFT revised Water Efficiency Plan Guidance Document was developed in accordance with §37-60-126 C.R.S., as well as the new Water Conservation Framework, created in the 2010 SWSI Conservation Levels Analysis Phase I project. The DRAFT revised Guidance Document is similar in format and structure to the CWCB Municipal Drought Management Plan Guidance Document, including a Template with required and recommended items to include in a local water conservation plan. These items are categorized as either required, beneficial, public or documentation (these are similar to the categories used for the Drought Management Plan Guidance Document). A set of worksheets are included as a tool, that water providers can use in either PDF or excel format to develop/update their water conservation plans and monitor their plan development process.

The revised Guidance Document focuses on the planning steps and the data and analyses water providers should include in water conservation plans. It also provides other resources that provide more detailed information on specific best practices and water conservation measures and programs.

Process for Revision

The document review process has consisted of the following sequential four reviews: 1) CWCB staff, 2) Water Conservation Guidance Document Advisory Group, 3) the CWCB's Water Conservation Technical Advisory Group (WCTAG). The WCTAG reviewed the Document twice, providing comments and suggested improvements, which were then integrated into the current Draft and, 4) a 45-day public comment period from May 21, 2012 to July 4, 2012.

Staff contacted all Covered entities and many other stakeholders, via multiple email invitations and by phone, to ask that they thoroughly review the DRAFT Guidance Document and provide the CWCB with comments. CWCB Staff has collected, addressed and integrated all comments into the final draft document. Additionally, Staff met with Aurora Water and Denver Water to go through their comments in person.

The *Final Draft of the 2012 CWCB Water Efficiency Plan Guidance Document and Template* and the Public Comment Matrix have been sent under a separate mailing due to the length of public comment period and the time taken to incorporate the comments into the document. The Public Comment Matrix documented all the comments and feedback received from various Water Conservation Technical Advisory Group (WCTAG) members, water providers, and other stakeholders during the comment period. The comment matrix provides staff responses to the comments.



Municipal Water Efficiency Plan Guidance Document

July 2012



Prepared for:

Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203



Prepared by:

AMEC Environment & Infrastructure
1002 Walnut Street, Suite 200
Boulder, Colorado 80302



ACKNOWLEDGEMENTS

The development of this Municipal Water Efficiency Guidance Document (Guidance Document) was a collaborative effort led by the Colorado Water Conservation Board (CWCB) and facilitated by AMEC. The Guidance Document Advisory Group included eight municipalities, two non-profit organizations, and two consultants, all of whom played an integral role in the development of the Guidance Document. The stakeholder process involved a questionnaire, two-three hour workshops that focused on a review of the CWCB's 2005 Water Conservation Plan Development Guidance Document, and on details related to the new five-step water efficiency planning process. Following the workshops, the Guidance Document Advisory Group had the opportunity to review and provide valuable feedback on the draft materials. A public review process was also held where other water providers and the general public had the opportunity to comment on the document. Comments developed through these processes may be obtained by contacting the CWCB.

The CWCB and project team would like to thank the following stakeholders for their time and input on this document:

- Aurora Water
- City of Boulder
- City of Grand Junction
- City of Westminster
- Clear Water Solutions
- Colorado Springs Utilities
- Colorado Water Conservation Board's Water Conservation Technical Advisory Group
- Denver Water
- DiNatale Water Consultants
- Great Western Institute
- Town of Firestone
- Town of Clifton
- Western Resource Advocates



TABLE OF CONTENTS

1.0	INTRODUCTION TO THE MUNICIPAL WATER EFFICIENCY GUIDANCE DOCUMENT	1
1.1	SCOPE OF DOCUMENT	1
1.2	TERMINOLOGY	2
1.3	DOCUMENT ORGANIZATION	4
2.0	OVERVIEW OF WATER EFFICIENCY PLANNING	5
2.1	WHAT IS WATER EFFICIENCY?	5
2.2	WHAT IS EFFECTIVE WATER EFFICIENCY PLANNING?	5
2.3	WATER EFFICIENCY PLANNING AND WATER SUPPLY AND DROUGHT PLANNING	5
2.3.1	<i>Water Efficiency and Drought Management Planning</i>	<i>6</i>
2.3.2	<i>Water Efficiency and Demand Hardening</i>	<i>7</i>
3.0	ROLE OF THE STATE IN WATER EFFICIENCY PLANNING	9
3.1	STATE LEGISLATION	9
3.2	ROLE OF CWCBS AND WATER EFFICIENCY PLANNING	9
4.0	STEPS TO WATER EFFICIENCY PLANNING	11
4.1	STEP 1 – PROFILE OF EXISTING WATER SUPPLY SYSTEM	13
4.1.1	<i>Overview of Existing Water Supply System</i>	<i>13</i>
4.1.2	<i>Water Supply Reliability</i>	<i>14</i>
4.1.3	<i>Supply-Side Limitations and Future Needs</i>	<i>15</i>
4.2	STEP 2 – PROFILE OF WATER DEMANDS AND HISTORICAL DEMAND MANAGEMENT	16
4.2.1	<i>Demographics and Key Characteristics of the Service Area</i>	<i>16</i>
4.2.2	<i>Historical Water Demands</i>	<i>17</i>
4.2.3	<i>Past and Current Demand Management Activities and Impact to Demands</i>	<i>28</i>
4.2.4	<i>Demand Forecasts</i>	<i>33</i>
4.3	STEP 3 – INTEGRATED PLANNING AND WATER EFFICIENCY BENEFITS AND GOALS	35
4.3.1	<i>Water Efficiency and Water Supply Planning</i>	<i>35</i>
4.3.2	<i>Water Efficiency Benefits</i>	<i>39</i>
4.3.3	<i>Water Efficiency Goals</i>	<i>40</i>
4.4	STEP 4 – SELECTION OF WATER EFFICIENCY ACTIVITIES	42
4.4.1	<i>Demand Management Activities</i>	<i>44</i>
4.5	STEP 5 – IMPLEMENTATION AND MONITORING PLAN	56
4.5.1	<i>Implementation Plan</i>	<i>57</i>
4.5.2	<i>Monitoring Plan</i>	<i>58</i>



4.6	ADOPTION OF NEW POLICY, PUBLIC REVIEW AND FORMAL APPROVAL	60
4.6.1	<i>Adoption of New Policy</i>	60
4.6.2	<i>Public Review Process</i>	60
4.6.3	<i>Local Adoption and State Approval Processes</i>	60
4.6.4	<i>Periodic Review and Update</i>	61
4.6.5	<i>Local Water Efficiency Plans and Informational Resources</i>	62
5.0	PUBLIC STAKEHOLDER INVOLVEMENT	63
5.1	PLAN DEVELOPMENT WITH PUBLIC AND STAKEHOLDER PARTICIPATION	63
5.2	PUBLIC PARTICIPATION WITH IMPLEMENTATION AND MONITORING.....	66
6.0	ORGANIZATION AND CONTENT – TEMPLATE FOR A WATER EFFICIENCY PLAN.....	68
6.1	ORGANIZATIONAL TIPS FOR WATER EFFICIENCY PLANS	68
6.2	HOW TO USE THE MODEL TEMPLATE	68
6.3	WATER EFFICIENCY PLAN MODEL TEMPLATE.....	69
7.0	REFERENCES.....	89
Appendix A Guidance Document Worksheets		A.1
Appendix B State Policy		B.1

LIST OF TABLES

Table 1	Water Efficiency Activities and Drought Strategies	7
Table 2	Annual Treated Water Deliveries	18
Table 3	Average Monthly Treated Water Deliveries (2002-2009).....	19
Table 4	Annual Water Deliveries for a Dual Water Supply System	20
Table 5	Annual Treated Water Metered Use by Customer Category	23
Table 6	System-Wide Per Capita Water Demands	24
Table 7	Residential Per Capita Water Demands.....	26
Table 8	Water Efficiency Goals.....	41



TABLE OF FIGURES

Figure 1	Supply and Demand-Side of a Dual Water Supply System	3
Figure 2	Integrated Approach to Water Resources Planning	6
Figure 3	Five Steps to Municipal Water Efficiency Planning	11
Figure 4	Example Illustration of a Provider’s Water Supply System	14
Figure 5	Annual Treated Water Deliveries	18
Figure 6	Average Monthly Treated Water Deliveries (2002-2009).....	19
Figure 7	Annual Water Deliveries for a Dual Water Supply System	21
Figure 8	Average Treated Water Metered Use by Customer Category (2002 - 2009)	23
Figure 9	Annual Treated Water Metered Use by Customer Category	24
Figure 10	System-wide Per Capita Water Demands	25
Figure 11	Residential Per Capita Water Demands.....	26
Figure 12	Average Indoor and Outdoor Monthly Metered Water Use (2002-2009)	27
Figure 13	System-wide Per Capita Water Demands and Demand Management Savings	30
Figure 14	Actual and Normalized Per Capita Water Demands	31
Figure 15	Indoor Per Capita Water Usage and Passive Savings Estimate	32
Figure 16	Example of Timelines for a Planning Horizon, Plan Update and Monitoring	33
Figure 17	Demand Forecasts Using Per Capita Water Demand	34
Figure 18	Unmodified Annual Forecasted Demands for a Dual Water Supply System.....	35
Figure 19	Unmodified and Modified Treated Water Demands	37
Figure 20	Forecasted Unmodified Demands Showing Active and Passive Savings	38
Figure 21	Four-Phase Approach to Selecting Water Efficiency Activities	42
Figure 22	SWSI Levels Framework.....	45
Figure 23	SWSI Framework Selection Process	46
Figure 24	Foundational Activities.....	47



Figure 25 Targeted Technical Assistance and Incentives 50

Figure 26 Ordinances and Regulations 52

Figure 27 Education Activities..... 55

Figure 28 Public and Stakeholder Involvement during the Five-Step Water Efficiency
Planning Process 65



1.0 INTRODUCTION TO THE MUNICIPAL WATER EFFICIENCY GUIDANCE DOCUMENT

The Water Conservation Act of 2004 (HB 04-1365) requires all covered entities (retail water providers that sell 2,000 acre-feet (AF) or more on an annual basis) to have a State approved water efficiency plan containing certain required minimum plan elements. This Municipal Water Efficiency Plan Guidance Document (Guidance Document) is an update to the Water Conservation Plan Development Guidance Document developed in 2005.¹ It serves as a reference tool for water providers and local governments throughout the State of Colorado (State) for developing State approved local water efficiency plans. The objectives of the document are as follows:

- Provide a comprehensive background on water efficiency planning.
- Provide guidance to Colorado municipalities that are diverse due to geographic location, size, water supply sources and financial resources.
- Clearly specify the plan elements required for State approved plans per the Water Conservation Act of 2004.
- Include water efficiency planning data required under the *Act Concerning Additional Information Regarding Covered Entities' Water Efficiency Plans*, as approved under House Bill (HB) 10-1051 for annual reporting purposes to the State.
- Include the State's most recent efforts to characterize demand management by incorporating the Statewide Water Supply Initiative's (SWSI) water conservation levels framework and establishing linkages with other water efficiency tools such as the Colorado WaterWise Best Practices Guidebook.

1.1 Scope of Document

This Guidance Document provides a comprehensive overview of municipal water efficiency planning in Colorado and is intended for water provider staff and contractors who have a moderate level of experience in water efficiency and water supply planning. The document is intended to be used in conjunction with other water efficiency tools and resources for local municipal water efficiency planning. Many of these tools and resources are provided on CWCB's website, which is routinely updated to provide up-to-date information on water efficiency planning.

This document provides basic introductory-level material on municipal water supply and demands. While this material is applicable to both water efficiency and supply planning efforts, it is important to note that this document is intended solely for the purposes of water efficiency planning. Water supply planning, water reliability planning, and/or integrated water resource

¹ For purposes of this Guidance Document, water efficiency is used in place of water conservation. See Section 2.1 for additional information.



planning generally involves a much more in-depth study of water demand and supplies as well as expanded analyses of alternative water supplies and other related factors, such as economics and environmental considerations. Relevant information from these planning processes (e.g. demand data presented in Section 4.2) should be incorporated into local water efficiency plans.

Water providers throughout the State have diverse portfolios of water rights and water supply sources and face unique demand and water supply-related challenges. Water efficiency planning must be customized to the needs of each individual water provider and also fit within budgetary constraints. Water providers will find that some of the information presented in this Guidance Document is not applicable to their water supply systems or individual water efficiency planning efforts. In other cases, water providers may not have the resources or data necessary to satisfy all of the presented recommendations. However, special attention should be directed to all plan elements that are required by Colorado statute for water efficiency planning. The full evaluation of these plan elements is necessary to achieve State approval of a local water efficiency plan.

1.2 Terminology

This section provides an overview of some of the common terminology used in this document. Please note that this is not a comprehensive list of all terms and definitions. Other important terminology is reserved for discussion in the document.

Dual water supply systems – Water supply systems that use a combination of treated water to meet potable water needs and reclaimed water and/or non-treated water (i.e. untreated ditch water and groundwater) to meet non-potable water needs.

Supply-side – Water supply operations and facilities that include the diversion, extraction, storage, and transmission of untreated water. Figure 1 illustrates this concept. All components on the left-hand-side of the figure are considered supply-side.

Demand-side – The distribution and consumption of treated water supplies for domestic purposes or the delivery and use of reclaimed water or untreated raw (i.e. ditch water, groundwater) for non-potable purposes such as irrigation or industrial processes. Figure 1 illustrates this concept.

Non-revenue water – Annual non-revenue water (previously referred to as unaccounted for water) consists of unbilled authorized uses (i.e. hydrant flushing), apparent losses, and real losses.² Real losses consist of leaks in the water distribution system that does not reach the end user. Apparent losses consist of unauthorized consumption, customer metering inaccuracies, and data handling errors.

System water demand – Volume of water necessary to meet customer water needs within a certain period of time.³ System water demand is typically measured at the point of discharge from the water treatment plant and includes non-revenue water. In dual water supply systems,

² Source: American Water Works Association. 2006. *Water Conservation Programs – A Planning Manual. Manual of Water Supply Practices M52. First Edition.*

³ Source: Billings, R. B and Jones, C.V. 2008. *Forecasting Urban Water Demand.* American Water Works Association.



system water demand may also include the distribution and delivery of non-potable water (i.e.: reclaimed water and untreated ditch and groundwater) to meet irrigation needs.

Customer water demand – Volume of water necessary to meet customer water needs at the end point. In contrast to system water demand, customer water demand does not include non-revenue water. Customer water demand is metered at the end point.

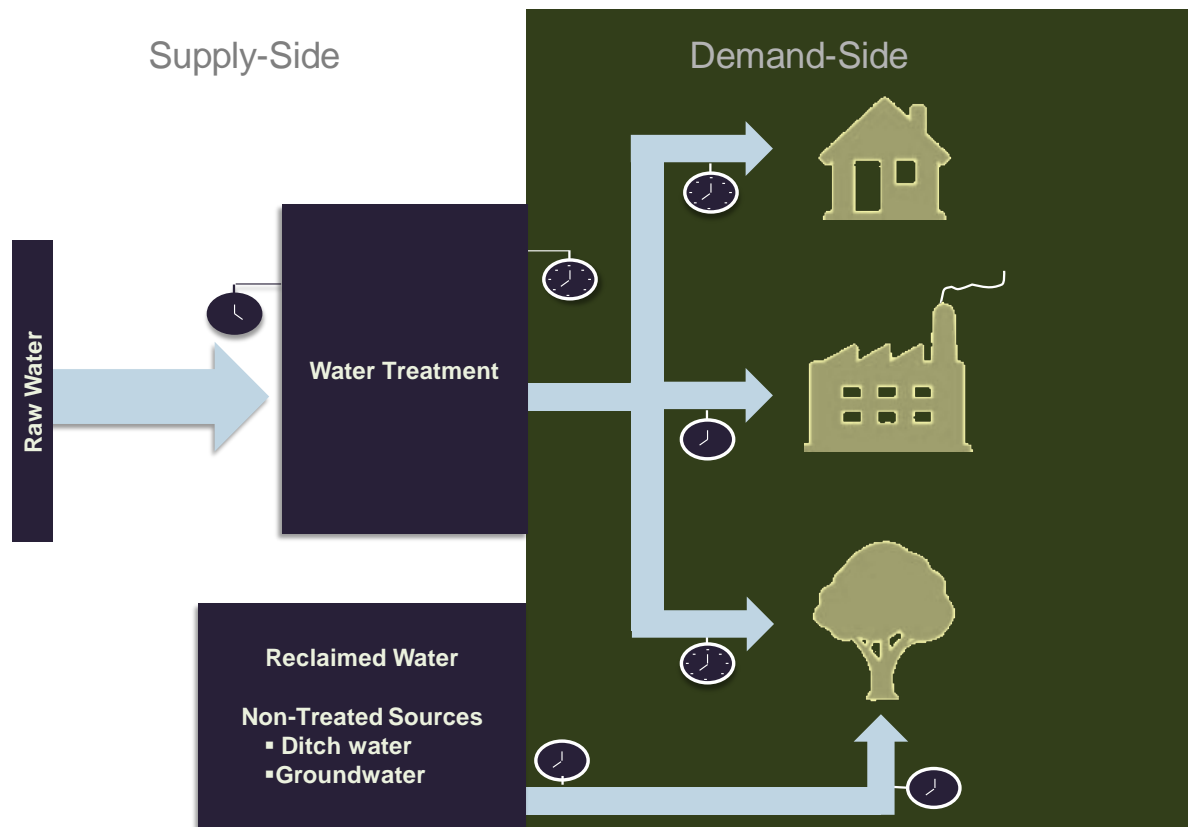


Figure 1 Supply and Demand-Side of a Dual Water Supply System

Water efficiency – Water efficiency includes the practices, techniques, and technologies that extend water supplies either directly through water savings or through substituting alternative supplies such as reuse. For purposes of this Guidance Document, water efficiency is inclusive of water conservation and is used instead of “water conservation.” The term water efficiency captures the essential objective of a local plan which is to improve the efficiency of a municipal demand and water supply system. Water efficiency includes both system demands and customer water demands⁴.

⁴ CWCBC’s former 2005 Water Conservation Plan Development Guidance Document and other literature on conservation and water use efficiency distinguish supply-side and demand-side water use efficiency. These resources generally characterize demand-side as technical efficiencies (e.g. water efficient toilets) and behaviors (e.g. taking shorter showers) save water at the end use/water user level. Supply-side refers to water efficiency at the system level such as the repair of pipeline leaks and water reuse. For purposes of this Guidance Document, the distinction between these two terms does not provide an added benefit and hence in order to simplify terminology, water efficiency encompasses both supply and demand side efficiencies.



Water efficiency activities – Traditionally water efficiency activities have been referred to as water conservation measures and/or water conservation programs. For purposes of this Guidance Document, measures and programs are replaced with water efficiency activities. Water efficiency activities encompass all efforts to either save water or improve efficiencies within a water supply system.

Demand management – The implementation of water efficiency activities to reduce water deliveries (demands) and/or improve efficiencies within the distribution system. For purposes of this document, demand management refers to both system and customer water demands. Demand management is used interchangeably with water efficiency.

1.3 Document Organization

This Guidance Document is organized into the following sections:

- Section 1.0 – Details the general purpose, scope, and general organization of the document.
- Section 2.0 – Introduces water efficiency; the importance and purpose of water efficiency planning; and the importance of integrating water efficiency planning with drought management planning and water supply reliability planning.
- Section 3.0 – Addresses both the State’s and CWCB’s role in water efficiency planning.
- Section 4.0 – Provides an in-depth discussion on the five recommended steps for water efficiency planning. This detailed information complements the Model Template in Section 5.0.
- Section 5.0 – Introduces the benefits and concept of incorporating a stakeholder process during the development of a water efficiency plan.
- Section 6.0 – Provides a Water Efficiency Plan Model Template that corresponds with the five-step water efficiency planning process detailed in Section 4.0. Providers may use this Model Template as an organizational checklist to select plan elements for incorporation into their plans as well as to ensure that the statutory elements required for State approval are incorporated into the final plan.
- Appendix A – Provides a series of optional worksheets that providers may use as a toolkit to generate ideas, organize information, and format data for direct incorporation into their plans.
- Appendix B – Provides copies of applicable State water efficiency policy.



2.0 OVERVIEW OF WATER EFFICIENCY PLANNING

As the population continues to increase in the State and the scarcity and cost of water supplies are increasing, it is important for water providers to anticipate future water demands and conduct the level of water supply planning necessary to ensure that the future needs of their customers are met. Water efficiency planning is an important tool in meeting long-term water supply needs while maintaining quality of life standards. Therefore, water efficiency planning is a necessary component to a water provider's future water supply planning efforts.

2.1 What is Water Efficiency?

Water efficiency may be thought of as doing more with less. It includes the practices, techniques, and technologies that extend water supplies and other resources (e.g. energy) by either saving water or through substituting with alternative supplies such as reuse. This, in turn, frees up water supplies for other uses, such as new development, stored drought reserves, agricultural leases, and environmental uses (e.g. instream flows).

Although water efficiency is an important tool, water efficiency must operate within the context of Colorado water law which specifies that each water right must be used for beneficial use for decreed purposes without waste. While water efficiency may be used to directly address waste, it should not be construed as a means to reduce the beneficial use of a provider's water rights.

2.2 What is Effective Water Efficiency Planning?

The quality and success of water efficiency planning depends on the combined effects of the following:

- Development of goals that reflect water supply system needs.
- Selection of implementable water efficiency activities that address the goals and can be monitored to track progress.
- Involvement of public and community group input and participation.
- Routine monitoring of demands and effectiveness of water efficiency activities.
- Ability to make effective adjustments to the water efficiency program to improve performance.

2.3 Water Efficiency Planning and Water Supply and Drought Planning

Water efficiency planning, drought planning and water supply and reliability planning are interrelated and should be conducted in an integrated manner. For example, the severity of a water shortage during a drought is highly dependent on the reliability of water supplies. Water efficiency can be an integral component to a provider's water supply reliability planning by reducing customer demands. Effective water resource planning, as shown in Figure 2,



recognizes the link between each of these processes and the need to coordinate all three planning efforts.



Figure 2 Integrated Approach to Water Resources Planning

This integrated approach can help water providers identify where future planning efforts need to be focused. Providers should examine the effect of water efficiency on future water supply and demand and estimate how water efficiency may affect (e.g. reduce) the need for and the costs of new water supplies and other investments. Section 4.3.1 provides additional information on the benefits of water efficiency planning within the context of water supply and reliability planning.

2.3.1 Water Efficiency and Drought Management Planning

One of the main objectives of a water efficiency plan is to achieve lasting, long-term improvements in water efficiency while reducing overall water demands. In contrast, a drought management plan focuses on mitigation and response strategies that can provide temporary and immediate relief from drought-related water supply shortages. Drought response measures often achieve temporary savings through changes in customer behavior during a drought. This may involve mandatory water restrictions for certain types of water use on a temporary basis. Drought mitigation applies to measures taken prior to a drought to avoid or reduce impacts during a drought.

Water efficiency activities that result in ongoing reductions in water demands can provide long-term drought mitigation benefits. For example, irrigation audits for parks, which are often employed as a water efficiency activity, can identify changes that will reduce the park's water demands on a permanent basis. This can consequently reduce impacts during a drought related water shortage only if some of the supplies saved as a result of the audit are retained to improve the reliability of the overall water system rather than committed to a new use elsewhere.

In contrast to mitigation, water saving measures reserved for temporarily reducing water demand during droughts are considered to be short-term drought response strategies and not long-term water efficiency activities. Whether a particular strategy is intended for water efficiency,



drought mitigation, drought response, or a combination of any of these depends on the timing of the strategy, how the strategy is implemented by the provider, and the permanency of the change in water use.

Table 1 lists examples of water efficiency activities that may be implemented for long-term drought mitigation or solely as a temporary voluntary or mandatory drought response strategy. Water efficiency planning and drought management planning are linked together. Strategies used on a long-term basis for drought mitigation (in advance of a drought) can provide long-term water efficiency benefits. These particular drought mitigation strategies should be incorporated into the water efficiency plan. Water Efficiency Activities and Drought Strategies

Table 1 Water Efficiency Activities and Drought Strategies

Water Efficiency Activities	Drought Strategies	
	Long-term Mitigation	Short-term Response Strategy
Irrigation audits for parks and open spaces	X	X
Install water saving fixtures, toilets, and/or appliances	X	
Limit landscape irrigation to certain days of week during drought		X
Limit landscape irrigation to certain days of week to manage peak flows	X	
Reduce irrigation on parks and landscaping	X	X
Replace turf with xeriscape landscape	X	
Limit outdoor watering to specific times of the day	X	X
Set time limit for watering (5:00 pm to 8:00 am)	X	X
Prohibit watering from November to March	X	X
Conversion of sprinkler to low volume irrigation where appropriate	X	
Identify high water use customers and develop water saving targets	X	X

2.3.2 Water Efficiency and Demand Hardening

Demand hardening is a concept described by the following:

“By saving water, long-term conservation can also reduce the water saving potential for short-term demand management strategies during water shortages.”⁵

For example, if the amount of irrigated turf is reduced in advance of a drought through conservation measures, the amount of “water savings potential” through outdoor irrigation savings available during times of drought could be reduced.

Whether this “water savings potential” is greater prior to the advent of water efficiency efforts than with ongoing water efficiency efforts, largely depends on how the saved water is used during normal and wet years. If saved water is stored in a reservoir as drought reserves or temporarily leased for agricultural use, the saved water would be available during times of

⁵ Flory, J.E., and T. Panella, 1994.



drought. Consequently, if the water saved through water efficiency is used to supply new growth, the savings may not be available during drought periods.

The intricacies of how certain water efficiency efforts affect the reliability of a provider's water supply during a time of drought are complex.⁶ The effects of demand hardening will vary widely among providers. It is not the intent of this document to define how providers perceive and experience demand hardening within their water supply systems, but rather to introduce the concept. Providers may need to address this issue while developing their drought management and water efficiency plans.

⁶ Additional information on demand hardening is provided in a memo authored by Peter Mayer and David Little titled *System Reliability and Demand Hardening*, prepared for: SWSI Conservation & Efficiency TRT M&I Question 1 Sub-group, March 14, 2006.



3.0 ROLE OF THE STATE IN WATER EFFICIENCY PLANNING

The State has a vested interest in promoting and supporting local water efficiency planning within the jurisdiction of Colorado’s legal water rights system. This is primarily conducted through three vehicles: State legislation, grant funding administered through the CWCB, and other CWCB water efficiency related activities.

3.1 State Legislation

The following State legislation addresses municipal water efficiency planning. Copies of these legislative bills are provided in Appendix B.

The Water Conservation Act of 1991 (HB 91-1154) declared: “... in view of the increasing competition and demand for water in the State of Colorado, it is the purpose of this act and the policy of the State to enhance the efficiency with which water is used to meet end uses, with the objective of making water available for all beneficial uses in Colorado.” This act established the Office of Water Conservation to provide technical and financial assistance to municipal and other urban water providers and state agencies to support their water efficiency planning efforts.

The Water Conservation Act of 2004 (HB 04-1365) enhanced CWCB’s Office of Water Conservation and Drought Planning (OWCDP) role in providing technical and financial assistance for drought and water efficiency planning efforts to other entities within the State. Additionally, it required all covered entities (retail water providers that sell 2,000 acre-feet (AF) or more on an annual basis) to have a State approved water efficiency plan containing certain required minimum plan elements. C.R.S. 37-60-126 (1-4 and 5) govern the requirements put forth in HB 04-1365. These required plan elements are addressed in Sections 4.0 and 6.0 of this Guidance Document.

The Act Concerning Additional Information Regarding Covered Entities’ Water Efficiency Plans (HB 10-1051) requires covered entities to report water use and water efficiency data on an annual basis to the State for statewide water supply planning. C.R.S. 37-60-126 (4.5) governs the requirements put forth in HB 10-1051. This Guidance Document specifies the water efficiency planning data required by C.R.S. 37-60-126 (4.5) in the Section 6.0 Model Template as well as in applicable worksheets.

3.2 Role of CWCB and Water Efficiency Planning

Public information and technical and financial assistance for water efficiency and drought planning is provided by CWCB’s OWCDP. Specifically the OWCDP provides the following:

- Maintains a clearinghouse of water efficiency and drought information and disseminates that information to the water community and public.
- Provides technical assistance and evaluates and approves water efficiency and drought mitigation plans.



- Provides financial assistance for water efficiency planning, water efficiency activities, drought management planning, and public education and outreach through the Water Efficiency Grant Program.
- Provides leadership through the Water Availability Task Force to monitor, forecast, mitigate, and prepare for drought.
- Coordinates with multiple state and local agencies to provide public information.

The CWCB website provides additional information on the items provided above. The OWCDP may be contacted directly for water efficiency-related information and technical assistance at 303-866-3441. Direct contact information is provided on CWCB's website.



4.0 STEPS TO WATER EFFICIENCY PLANNING

This section introduces and provides detailed information on the CWCB recommended step-by-step process to develop effective water efficiency plans. This section should be used in conjunction with the Model Template in Section 6.0 to develop local water efficiency plans. Please note that the organization of the Section 4.0 subsections coincide with the Model Template.

According to C.R.S 37-60-126, all State approved plans should summarize the steps used for plan development. Figure 3 illustrates the recommended five-step process to develop water efficiency plans.

*C.R.S. 37-60-126
Requirement: Steps
provider used to
develop its water
efficiency plan.*

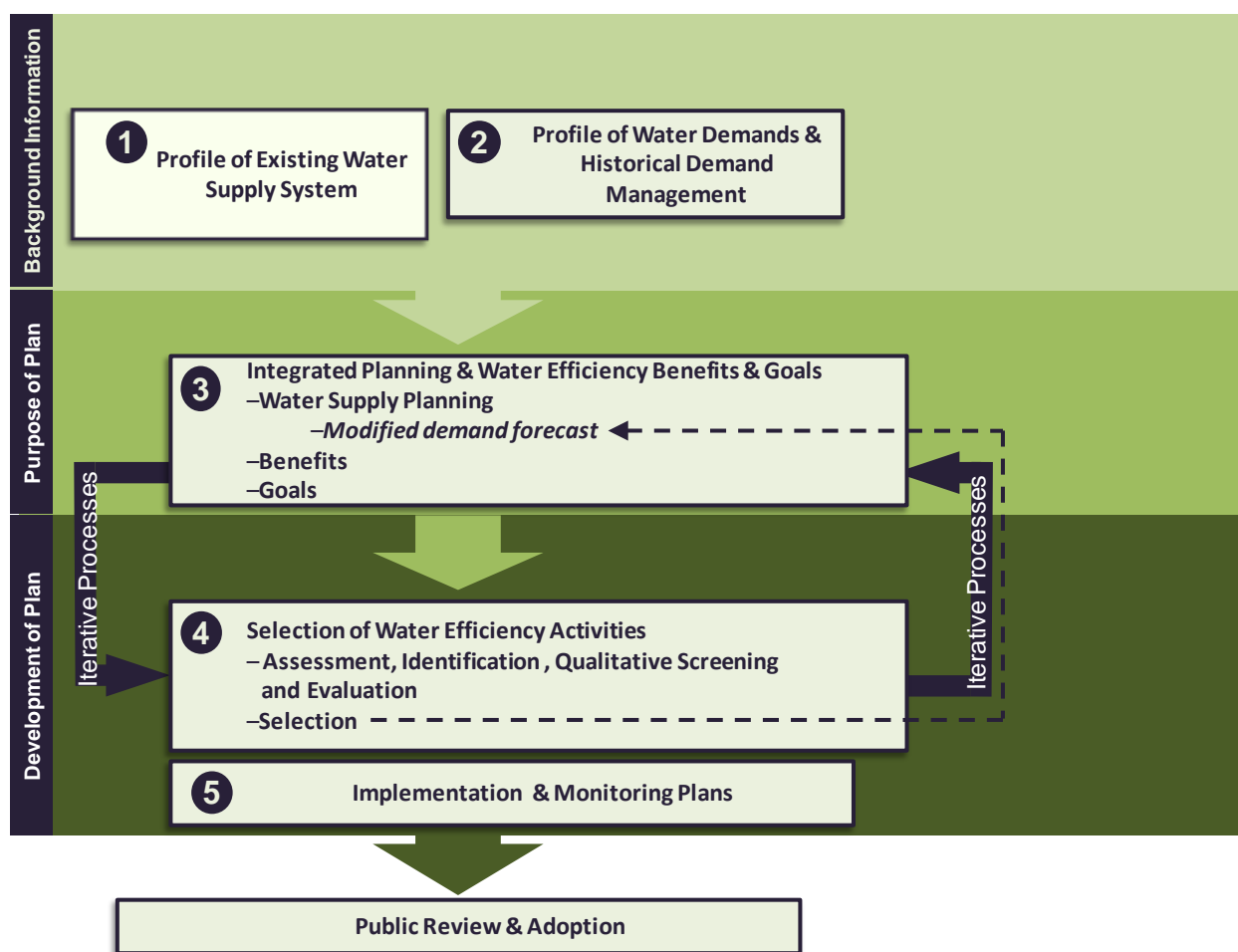


Figure 3 Five Steps to Municipal Water Efficiency Planning

The five steps consist of the following:

- *Step 1: Profile of Existing Water Supply System* – Collection and development of supply-side information and historical supply-side water efficiency activities.



- *Step 2: Profile of Water Demands and Historical Demand Management* – Collection and development of demand data and historical demand management activities.
- *Step 3: Integrated Planning and Water Efficiency Benefits and Goals* – Identification of how water efficiency will be incorporated into future water supply planning efforts and development of water efficiency benefits and goals.
- *Step 4: Selection of Water Efficiency Activities* – Assessment, identification, screening, and evaluation process to select and fully evaluate a portfolio of water efficiency activities for implementation.
- *Step 5: Implementation and Monitoring Plans* – Development of an implementation and monitoring plan.

Steps 1 and 2 entail the collection of supporting background supply- and demand-side information necessary for the development of an effective plan. This information is carried into Steps 3, 4, and 5. Step 3 focuses on the development of efficiency goals and outlines the benefits of the water efficiency plan. Steps 4 and 5 comprise the bulk of the plan development where the water efficiency activities are selected and implementation and monitoring plans are developed. The public review and local adoption of the water efficiency plan are not part of the five steps described above; however, they are a requirement for a State approved plan and are described more in depth in Guidance Document Section 4.6.

While Figure 3 presents these steps in sequential order, it is important to note that components of certain steps cannot be fully completed until information from latter steps is obtained. This iterative process is presented as arrows in Figure 3 and outlined below:

- *Steps 1 and 2* – Obtain background supply- and demand-side data in Steps 1 and 2.
- *Step 3* – Develop preliminary benefits and preliminary goals based on the identified benefits and information from Steps 1 and 2.
- *Step 4* – Develop screening criteria and evaluation factors based on the preliminary goals and information acquired in Steps 1 and 2, and develop a portfolio of water efficiency activities with estimated water savings. Revisit Step 3.
- *Step 3 Iteration* – Develop modified demands based on the water saving estimates developed in Step 4 and if applicable, identify potential modifications to facilities and water purchases.
- *Step 4 Iteration* – If necessary, return to Step 4 to finalize the water efficiency activity portfolio.
- *Step 3 Iteration* - Finalize the goals and benefits based on the final water efficiency activity portfolio and modified demands.



- *Step 5* – Develop the implementation and monitoring plans and address potential revenue changes.

4.1 Step 1 – Profile of Existing Water Supply System

Step 1 involves a thorough review of the existing water supply system, water supply reliability, system challenges and limitations, and past supply-side water efficiency activities. This supply-side assessment provides background information critical to developing effective water efficiency plans and should draw upon information obtained from other water supply planning efforts.

4.1.1 Overview of Existing Water Supply System

The main objective of this section is to provide general background and context of the provider's existing water supply system. An overview of the existing water supply system is beneficial to water efficiency planning. Background information is valuable for the general public, the CWCW when reviewing the document, and for others who may not be as familiar with “a particular entity's water resources” and the needs of the water provider.

Information that may be provided in a system-wide overview includes:

- Geographic area served and/or map of service area.
- Raw non-potable water, treated water, and reclaimed water supply sources.
- Key existing facilities. This may include brief descriptions of the following:
 - *Reservoirs* – general location, acre-feet of storage
 - *Groundwater wells* – general location of well(s), source aquifers
 - *Water treatment plant(s)* – general location, capacity, type of treatment
 - *Wastewater treatment plants(s)* – general location, capacity, type of treatment
 - *Water distribution system* – miles of pipeline, number of pressure zones

For security reasons, some of this information (e.g. the location of facilities) may be considered sensitive and it may be within the best interest of the provider's customer base to limit and simplify the information provided. Figure 4 provides an example illustration of how basic information on the water supply system can be conveyed without presenting exact facility locations.

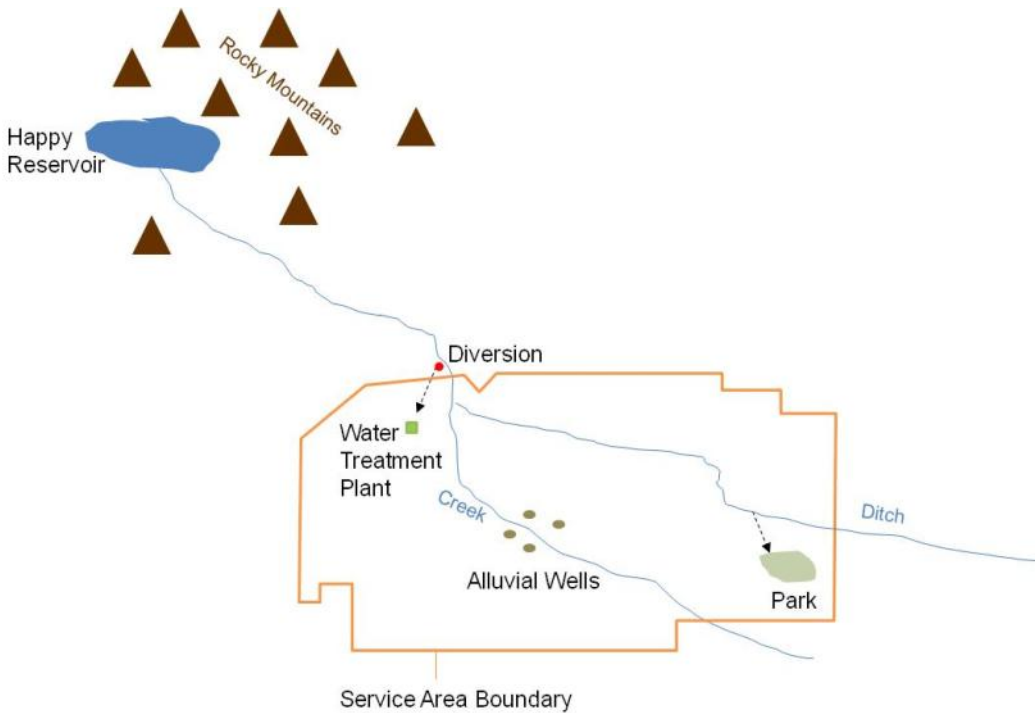


Figure 4 Example Illustration of a Provider's Water Supply System

4.1.2 Water Supply Reliability

Water savings achieved through improved water efficiency can impact water supply reliability. For instance, supply systems located in areas designated by the Statewide Water Supply Initiative (SWSI), or by other regional studies as currently water short or projected to be water short in the future, could benefit from an increase in water efficiency efforts. It is important to have a thorough understanding of the reliability of the provider's water supply system and a general introduction to the provider's water supply reliability provides a more comprehensive water efficiency plan.

This may include the following:

- *Overview of how a provider determines reliability of their water supply system* – This may include a brief description of the provider's water supply reliability modeling efforts in layman terms.
- *Firm yield* – The yield of the water supply system in a critical drought year.⁷
- *Reliability/drought criteria* – The critical drought year(s) that are used for water supply planning purposes (e.g. 1 in 50 year drought) or other reliability criteria.

⁷ Water providers often base the reliability of their water system by modeling the firm yield of their water supply system assuming a critical drought year. This approach is used to determine whether the provider's water supply system can provide reliable supplies under severe drought conditions represented by a designated critical drought year. For example, a critical drought year may be a 1 in 50 year drought, which corresponds to a dry period that is likely to occur, on average, once every 50 years.



- *Safety factors* – Additional level(s) of contingency built into water supply systems for emergency situations and/or droughts that are more severe than the critical drought (e.g. storage reserves).
- *Climate change* – Some providers directly incorporate climate change into their water supply planning modeling while others monitor research on climate change, yet do not incorporate it directly into their planning efforts. Other providers do not follow climate change, due to lack of expertise and/or financial resources.

Providers that have additional supplies after meeting their municipal needs in wetter years may choose to use their “excess water” for alternative beneficial uses. These alternative uses may include agricultural leases, increased drought reserves, instream flows, etc. In some cases, the water savings achieved through an increase in water efficiency efforts could be used to increase supplies for alternative uses. If applicable, providers should identify such opportunities and whether or not they are beneficial to pursue. Depending on the sensitivity of this information, these opportunities may or may not be included in water efficiency plans.

4.1.3 Supply-Side Limitations and Future Needs

Water efficiency can assist in alleviating existing water supply system limitations and meeting future needs. During this planning process it is important to identify system limitations and future needs to determine if and how water efficiency can help alleviate these issues. Information from this process may assist in developing the Step 3 water efficiency benefits and goals. Examples of such water supply limitations and needs include the following:

- System is in a designated critical water supply shortage area.
- System is vulnerable to water shortages, emergencies and/or safe yield problems for the entire system or a portion of the system.
- System has excessive non-revenue water.
- System is experiencing high rates of population and demand growth.
- Planning substantial improvement or additions to water supply system.
- Increases to wastewater system capacity are anticipated.
- System needs additional drought reserves.
- System has or anticipates drinking water quality issues.
- System has aging infrastructure in need of repair.
- Issues with water pressure in portions of the distribution system.
- System needs permit(s) to pursue water supply projects.



State approved plans should include a list of water supply system limitations and potential challenges. [Worksheet A](#) provides a template that may be used to furnish this information.

Once the system limitations and challenges are identified, plans for new facilities/modifications, water purchases, and other actions needed to meet the identified challenges and limitations should be provided. The majority of this information may be obtained from other documents such as integrated water resource plans, capital improvement plans, raw/treated water master plans, etc. [Worksheet A](#) provides a template that may be used to furnish this information.

It is recognized that water right and infrastructure information can be sensitive and, consequently, it may not be appropriate for some providers to include details in their plans. In these cases, the challenges and limitations may be addressed in general terms to preserve confidentiality. Regardless of how this information is included, it is highly recommended that the provider go through the process of identifying system limitations and challenges in order to determine how water efficiency could be a beneficial component to future planning efforts in Step 3.

4.2 Step 2 – Profile of Water Demands and Historical Demand Management

Step 2 involves an overview of the historical water demand trends as well as the influence of historical water demand management on water use and forecasted future water demands. Similar to Step 1, this demand-side assessment provides background information critical to developing effective water efficiency plans and should draw upon information obtained from other water supply planning efforts.

4.2.1 Demographics and Key Characteristics of the Service Area

The demographics of a community can influence water demands and the types of demand management activities that are most conducive for implementation. A broad assessment of the demographics in the service area should be conducted to identify key considerations to incorporate in later steps of the plan development. Key demographic data include:

- *Customer categories* – Providers have different ways of categorizing customer types. Typical categories include single-family, multi-family, commercial, municipal, and irrigation. These customer categories should correspond to the customer category demand data discussed in Section 4.2.2.
- *Service area population* – Current population residing within the service area. Estimates of employees commuting into the service area may also be included. Service areas that are influenced by tourism may also want to include tourist number estimates on a seasonal basis.

Additional information may also be provided if proven to be beneficial for later planning purposes. This information may be provided in Step 2 or deferred to other more appropriate sections of a plan. These data could include:



- *Ages of housing stock and/or of indoor appliances and fixtures* – As discussed in Sections 4.2.3 and 4.2.4, this information is useful for estimating passive water savings. Detailed information may be placed in an appendix.
- *Age of water distribution system infrastructure* – This may include pipelines, tanks, pumps, etc. Generally, older system components are less water efficient and yield greater water savings if replaced or repaired than newer components of water supply systems.
- *Demographics* – This may include income, age, ethnicity, and other information useful to developing a public outreach campaign. The majority of this information may be obtained from Census data.
- *Largest water users* – This may entail large commercial users such as breweries, manufacturers, college campuses, HOAs, and specific homeowners that use the greatest amount of water in the residential sector.

4.2.2 Historical Water Demands

Demand data commonly originate from water treatment plant production data and metered end-use billing records. There are several typical challenges that providers may face which can place limitations on the type of data available for analysis. Examples of such challenges include:

- Billing systems are traditionally designed for financial and accounting purposes and may neither distinguish between customer category nor display monthly water use data in a convenient manner.
- Portion(s) of the service area may not be metered and consequently data are not available.
- Billing systems are routinely updated and historical demand data can be lost during the update process.
- Portions of the service area may be metered but not read or put into the database.
- Errors in billing data.

Billing systems and metering are considered foundational water efficiency activities. Providers experiencing these challenges should consider ways to improve these activities during the Step 4 water efficiency activities selection process. See Section 4.4.1 for additional information.

Water demands often vary on an annual basis, due to weather and other factors. Consequently, at a minimum, the previous five years of historical demand data should be provided for water efficiency planning purposes. There are many ways in which demand data can be presented in both graphical and tabular format. The remainder of this section provides a series of examples demonstrating how demands may be presented in plans.



Annual Treated Water

Table 2 and Figure 5 provide an example of how annual treated water may be presented. These data are commonly obtained from water treatment plant production data or the total amount of water delivered to the end user. Plans should clearly specify the raw data source (e.g. water treatment plant production data).

Per C.R.S. 37-60-126 (4.5), delivered water or water production data are required for annual reporting purposes.

*C.R.S. 37-60-126 (4.5)
Reporting Requirement:
Total annual treated
water deliveries.*

Table 2 Annual Treated Water Deliveries

Year	Annual Treated Water Deliveries (acre-feet)
2002	8,309
2003	7,853
2004	7,408
2005	7,763
2006	7,538
2007	7,448
2008	7,572
2009	6,912

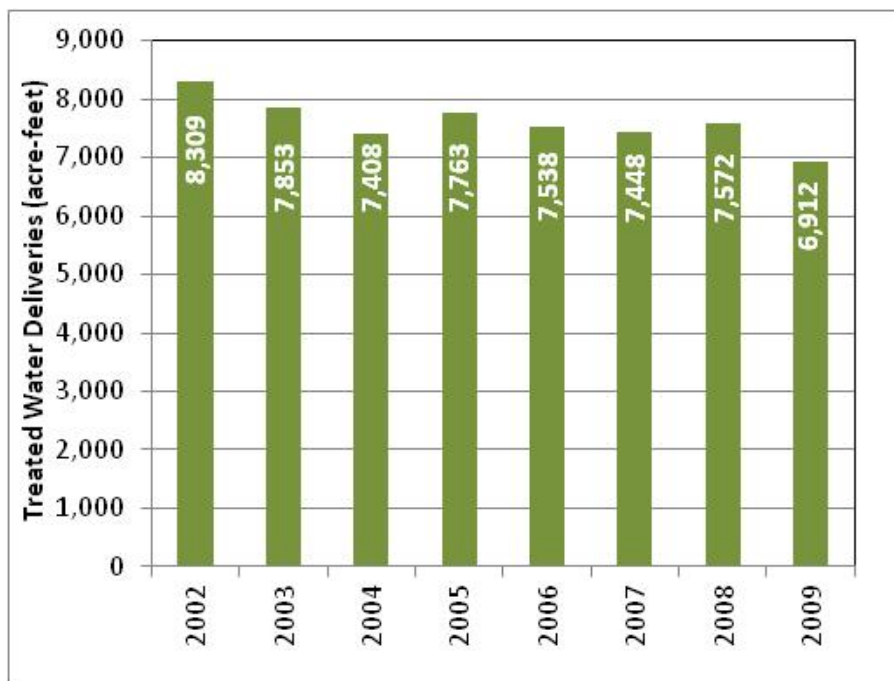


Figure 5 Annual Treated Water Deliveries



Monthly Treated Water Deliveries

Municipal water usage generally increases during the summer irrigation season in Colorado and consequently, is an important factor to account for in plans. For example, monthly demands can help identify when certain water efficiency activities should be implemented (e.g. public education on outdoor watering is most effective May through September). Table 3 and Figure 6 provide examples of monthly treated water deliveries.

Table 3 Average Monthly Treated Water Deliveries (2002-2009)

Month	Average Monthly Demands (acre-feet)	Non-Revenue Water (acre-feet)
January	404	28.3
February	387	27.1
March	419	29.3
April	507	35.5
May	750	52.5
June	935	65.4
July	1,144	80.1
August	955	66.9
September	790	55.3
October	508	35.5
November	403	28.2
December	398	27.9

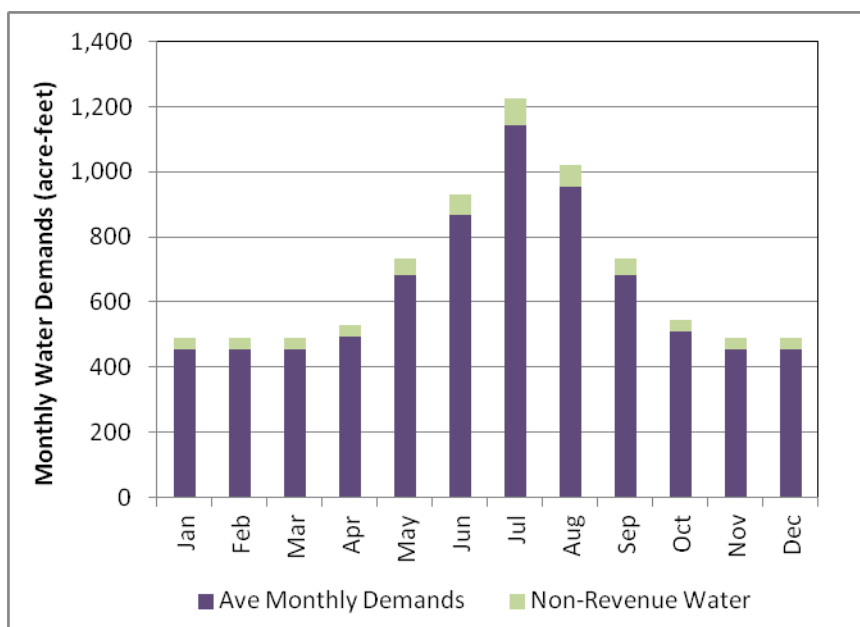


Figure 6 Average Monthly Treated Water Deliveries (2002-2009)

**Dual Systems – Annual Raw Water and Reclaimed Water Deliveries**

Many water providers have dual water supply systems where they rely on treated water deliveries for indoor and outdoor use, yet also rely on non-potable/raw water for some portion of outdoor irrigation. Non-potable water may consist of untreated groundwater, untreated ditch water rights, or reclaimed water. From a planning perspective, it is useful to distinguish the different types of usage in order to assess the future needs for each water type.⁸ Table 4 and Figure 7 provide examples of how annual water deliveries may be presented for a dual water supply system by water type.

Table 4 Annual Water Deliveries for a Dual Water Supply System

Year	Treated Water (acre-feet)	Raw Ditch Water (acre-feet)	Reclaimed Water (acre-feet)
2002	8,309	2,493	831
2003	7,853	1,963	393
2004	7,408	1,482	556
2005	7,763	1,553	776
2006	7,538	1,508	377
2007	7,448	2,234	745
2008	7,572	1,514	681
2009	6,912	2,074	691

⁸ Many raw water systems in Colorado are currently not metered. In these cases, historical raw water demand data may not be available and the plans should state that the raw water system is not metered and, consequently, raw water demand data are not available. The installation of a raw water metering system should be considered as a foundational water efficiency activity in Step 4. See Section 4.4.1 for further details.

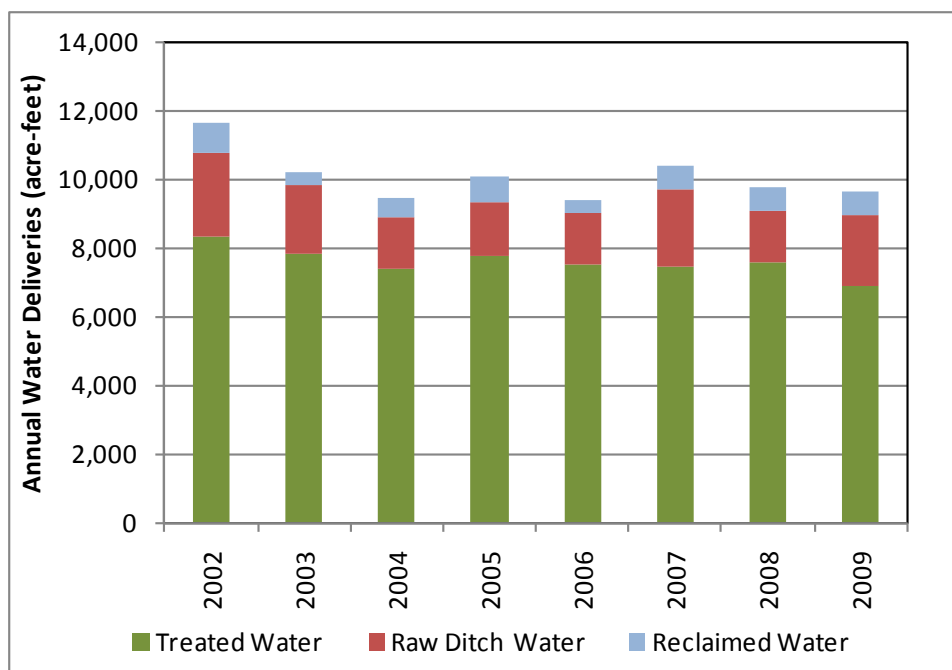


Figure 7 Annual Water Deliveries for a Dual Water Supply System

Raw water generally consists of untreated ditch or groundwater that is directly used for outdoor irrigation. In some special cases, raw water use could result in water savings. For instance, small amounts of water diverted from a generally full irrigation ditch with low seepage onto an adjacent park could be more efficient from a water savings perspective than using available treated water from the potable supply system that experiences significant conveyance losses. In these particular cases, State approved plans that claim a level of water savings through use of raw water should sufficiently demonstrate such water savings. In the example provided above, this would entail metered raw water diversion data and a detailed engineering comparison of the losses incurred through the raw water supply (e.g. ditch water losses) relative to the losses incurred through the potable system.

Despite these apparent efficiencies, many raw water systems serving municipal irrigation demands are not metered. Some of these systems could experience significant reductions in water use through metering the end users similar to treated water systems that regulate/inform the end users on how to conserve water. State approved plans may include raw water as a water efficiency activity as long as the raw water system is in itself metered and the end water use is used wisely (with little to no waste). Plans should clearly provide a description of the metering conducted for the raw water systems and activities implemented to promote wise water use by the end user.

Annual Non-Revenue Water

Annual non-revenue water (formerly referred to as unaccounted for water) consists of unbilled authorized uses (e.g. hydrant flushing), apparent losses, and real losses.⁹ Real losses consist of

⁹ Source: American Water Works Association. 2006. *Water Conservation Programs – A Planning Manual. Manual of Water Supply Practices M52. First Edition.*



leaks in the water distribution system that does not reach the end user. Apparent losses consist of unauthorized consumption, customer metering inaccuracies, and data handling errors.

Non-revenue water is commonly estimated as the difference between the water treatment plant production data and total billed water. Estimates may be further refined by conducting water distribution system audits and metering areas that traditionally were not metered. This is a foundational water efficiency activity discussed in Section 4.4.1. Per C.R.S. 37-60-126 (4.5), non-revenue water is required for annual reporting purposes to the State.

*C.R.S. 37-60-126 (4.5)
Annual Reporting
Requirement: Non-
revenue water.*

Annual Treated Water Metered Use by Customer Category

It is essential to understand water demands among different categories of customers to develop an effective water efficiency plan. These data are important in understanding how demands are proportionately distributed among a water supply system. For instance, understanding which customer category makes up the highest percentage of water users can assist in selecting water efficiency activities that target those specific customers.

However, as previously mentioned, billing systems can limit the availability of customer category demand data. At a minimum, a basic breakdown into residential and non-residential customers is a key starting point. Further delineation into residential, commercial, municipal, and irrigation categories is highly recommended. Water usage by customer category also includes usage by the municipality on its parks, open spaces, and other facilities. Separate, more detailed evaluations may also be conducted, such as assessing the average unit amount of water applied to a square foot of irrigated turf on City-owned parks. This could be an important parameter in determining whether the City can improve its irrigation efficiency.

*C.R.S. 37-60-126 (4.5)
Annual Reporting
Requirement: Annual
Treated Water
Deliveries by Customer
Type.*

Per C.R.S. 37-60-126 (4.5), annual treated water metered use by customer category is required for annual reporting purposes to the State. Figures 8 and 9 and Table 5 provide three methods for presenting water demands by customer category.

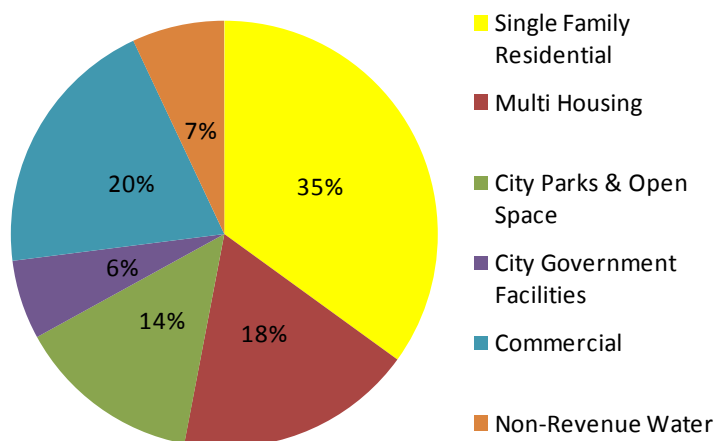


Figure 8 Average Treated Water Metered Use by Customer Category (2002 - 2009)

Table 5 Annual Treated Water Metered Use by Customer Category

Year	Single Family Residential	Multi-Housing	City Parks & Open Space	City Government Facilities	Commercial	Non-Revenue Water
2002	2,908	1,496	1,163	499	1,662	582
2003	2,749	1,414	1,099	471	1,571	550
2004	2,593	1,333	1,037	444	1,482	519
2005	2,717	1,397	1,087	466	1,553	543
2006	2,638	1,357	1,055	452	1,508	528
2007	2,607	1,341	1,043	447	1,490	521
2008	2,650	1,363	1,060	454	1,514	530
2009	2,419	1,244	968	415	1,382	484

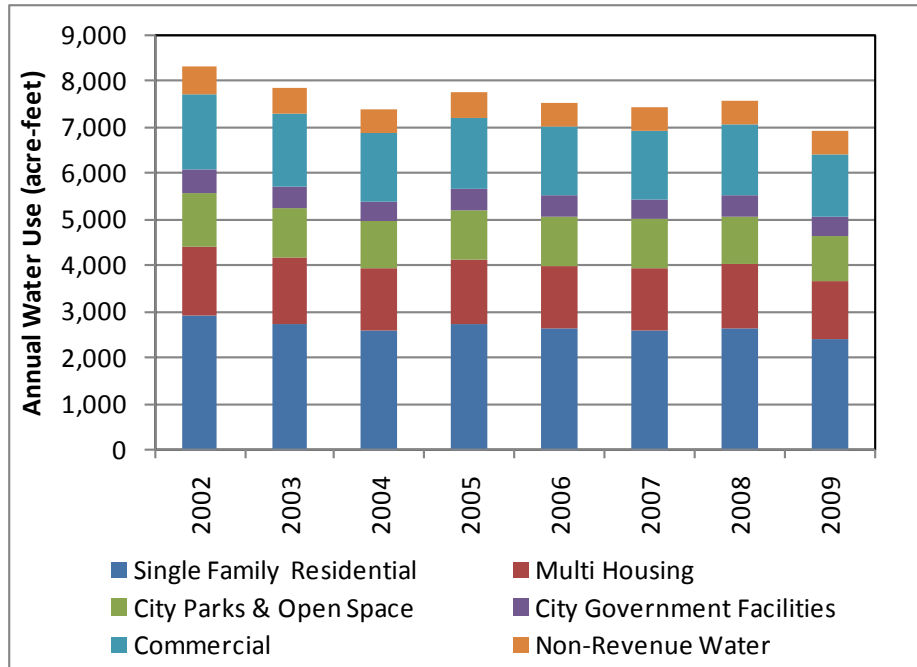


Figure 9 Annual Treated Water Metered Use by Customer Category

System-wide Per Capita Water Demands

Per capita water demand, typically expressed in gallons per capita/day (gpcd), is often calculated as the total water production divided by the population or as the sum of all metered end-use water deliveries divided by the population. The main difference between the two approaches is that the total production, or system-wide, approach includes non-revenue water while the metered end-use approach does not. Plans should clearly specify how system-wide per capita water demands are calculated. Table 6 and Figure 10 show examples of how to present system-wide per capita water demands.

Table 6 System-Wide Per Capita Water Demands

Year	System-wide Per Capita Demand
2002	161
2003	152
2004	143
2005	150
2006	145
2007	143
2008	145
2009	132

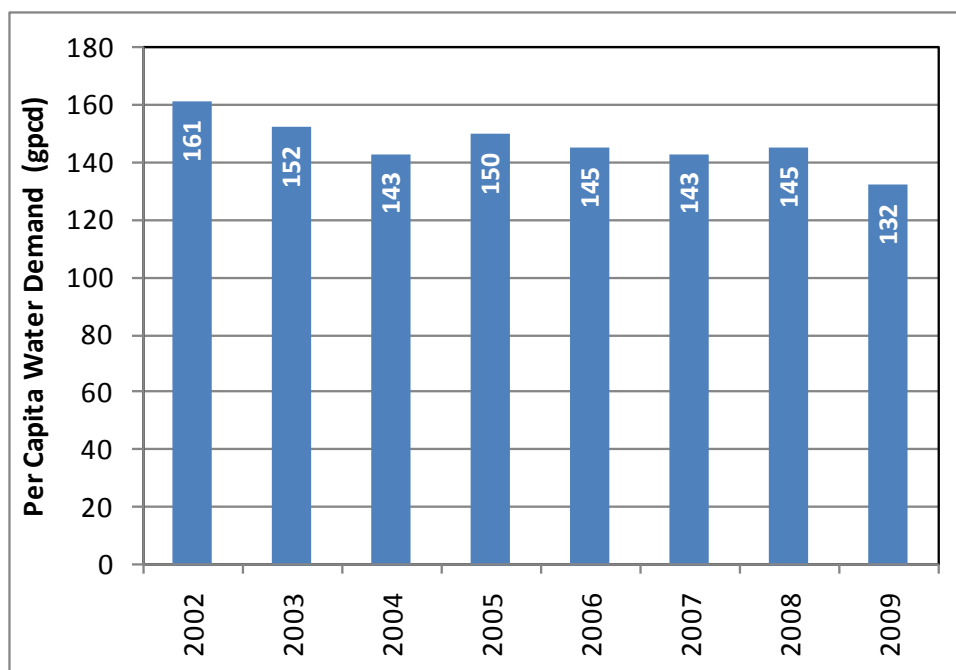


Figure 10 System-wide Per Capita Water Demands

System-wide per capita water demands are particularly useful for assessing trends and are incorporated into subsequent examples throughout this document. They are also commonly used to forecast future water demands as discussed in Section 4.2.4. However, while they can be very useful at an individual provider level, they should not be used as a means to compare water usage between other providers. This is partially attributed to the inconsistencies in the two calculation approaches discussed above, but also to the fact that there are many other factors that can skew the data, negating an “apples-to-apples” comparison. Such factors include large commercial and industrial sectors that can significantly influence system-wide per capita water demands. Additionally, resort communities can experience difficulties in developing representative annual per capita water demands. The numbers of visitors often vary seasonally (e.g. ski season) and are also impacted by economic conditions and weather.¹⁰

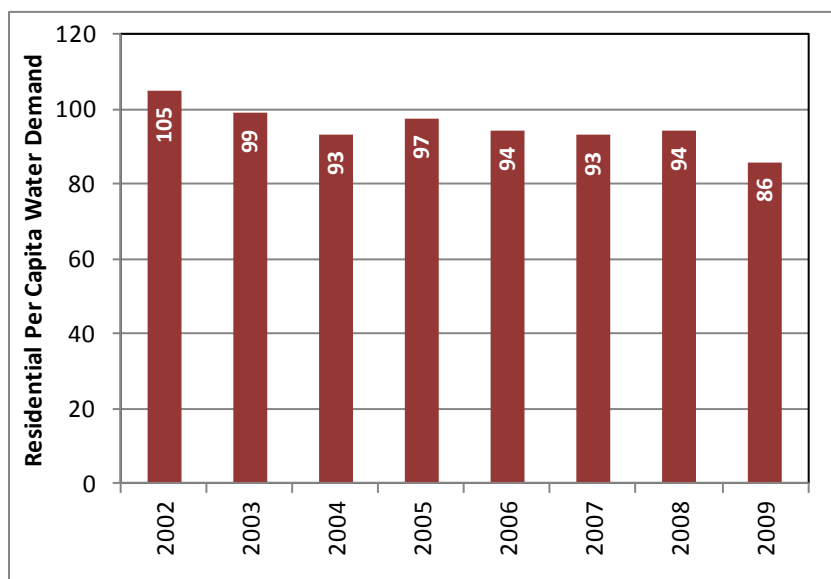
Unit Water Demands by Customer Type

Unit water demands by customer category are calculated by dividing the total metered use of a particular customer category by either population, number of accounts, number of irrigated acres for outdoor irrigation accounts, etc. Residential per capita water demands (residential water use divided by population) are commonly shown as well as water usage by account. Water usage by account is commonly used for non-residential accounts where the population may not be considered applicable. An example of residential per capita demands is provided in Table 7 and Figure 11.

¹⁰ Annual weather patterns influence per capita demands. Wetter years often result in less outdoor water usage resulting in a lower per capita demand than in dry years when the outdoor water usage is higher. Water providers may implement methods to normalize their per capita demands and “tease out” such weather impacts. An example of this is provided in Section 4.2.3.

**Table 7 Residential Per Capita Water Demands**

Year	Residential Per Capita Demand (acre-feet)
2002	105
2003	99
2004	93
2005	97
2006	94
2007	93
2008	94
2009	86

**Figure 11 Residential Per Capita Water Demands**

Large Water Users

In addition to the data provided above, demand data from the largest water users can provide valuable insight to assist with selecting water efficiency activities. As discussed in more detail in Section 4.4.1, activities focusing on the largest water users can be extremely cost-effective, providing the largest “bang for the buck” by targeting a small select group of customers who contribute to a significant proportion of total water usage.

Large water users may include industrial users such as breweries, factories, university campuses, or large commercial users. In addition, residential homes using a large amount of water may be flagged as high users for targeting certain water efficiency activities such as public education, free outdoor water audits, etc.

Customers who are inefficient with water usage (essentially wasting water), particularly with outdoor usage, may also be identified. One technique to do this is to determine unit water usage



rates by dividing the water usage of individual customers by the area of irrigated turf on their property over a given time period (e.g. month(s) or season) as reflected in Equation 1. A general level of spatial analysis (e.g. remote sensing coupled with geographic information systems (GIS)) may be necessary to determine irrigated acres on individual properties.

Equation 1:

$$\text{Water Usage of Customer (gallons per acre/month)} = \frac{\text{Water Usage of Customer (gallons/month)}}{\text{Area of irrigated turf (acres)}}$$

Indoor and Outdoor Demands

Figure 12 provides an example of monthly indoor and outdoor water demands. Indoor and outdoor water demands are often estimated using monthly metered water use data. This may be calculated by assuming that monthly indoor water demands are generally the same throughout the year and that the total monthly demands from November through February consist solely of indoor water use. Based on these assumptions, the indoor water demands from March through October is equal to the average value of the monthly November through February demands. Outdoor demands during the irrigation months are estimated by subtracting the average November through February total demand from the respective total monthly demands. An example for the month of June is shown in Equation 2 below:

Equation 2:

$$\text{June outdoor demand} = \text{June total demand} - \left[\frac{\text{Nov} + \text{Dec} + \text{Jan} + \text{Feb Total Demands}}{4} \right]$$

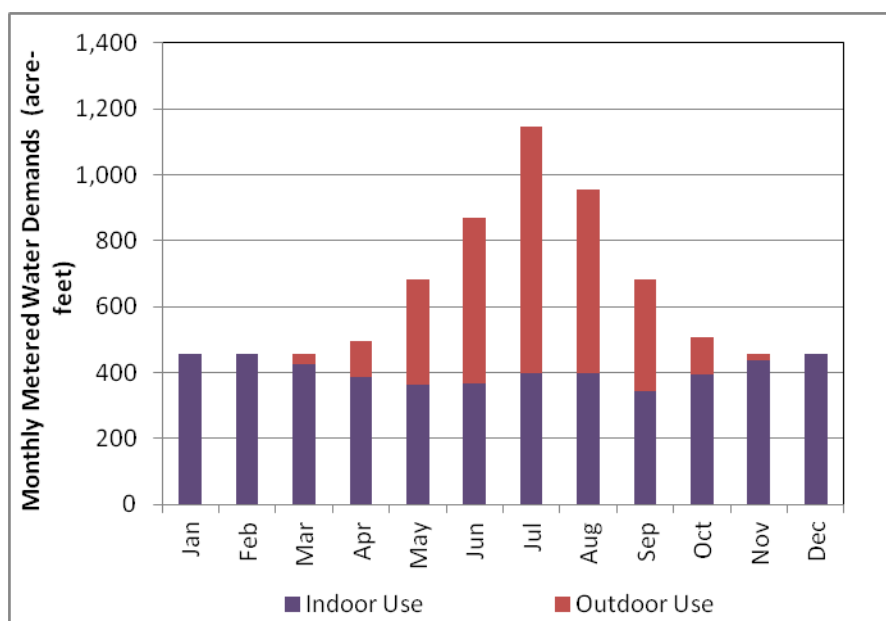


Figure 12 Average Indoor and Outdoor Monthly Metered Water Use (2002-2009)



Annual Peak Day Demands

Annual peak day demands are useful if a provider needs to control their daily peak flow rate during a high demand period in the summer due to capacity or energy constraints. Water efficiency activities such as regulating the days in which customers may irrigate can be used to manage peak day flows.

4.2.3 Past and Current Demand Management Activities and Impact to Demands

The overall quality and effectiveness of a water efficiency plan is enhanced by incorporating lessons learned from previously implemented water efficiency activities. Most providers in Colorado implement some level of a water efficiency program. This may vary from maintenance activities such as a leak repair program to a State approved water efficiency plan and diligent monitoring effort.

According to C.R.S. 37-60-126 (4), all State approved plans must include an estimate of the amount of water saved through previous demand management efforts as a percentage¹¹ or in acre-foot increments. These estimates should represent, at a minimum, the annual savings of each relevant SWSI Levels Framework level introduced in Section 4.1.1 or for at least the past five years of each individual activity.

*C.R.S. 37-60-126 (4)
Requirement: Either as a percentage or in acre-foot increments, an estimate of the amount of water that has been saved through a previously implemented conservation/water efficiency plan.*

Along with water savings, it is essential to provide a list of the historical demand management activities and period in which they were implemented. A template that may be used to record this information is provided in [Worksheet B](#) which is organized according to the SWSI Level Framework discussed in detail in Section 4.4.

It is important to note that the level of effort necessary to estimate demand management water savings and the corresponding impact on total annual water demands is greatly reduced if the provider is monitoring water demands and demand management efforts on a regular basis. For instance, the majority of this information may be obtained directly from annual monitoring reports that include activities implemented that year, annual water saving estimates, supporting demand data and challenges/successes faced that year. If such an analysis is not being conducted, this exercise, in addition to the demand data collection addressed in Section 4.2, will be extremely helpful in developing a monitoring plan in Step 5.

Estimating water savings for demand management activities is a complex process that involves a certain degree of technical and analytical expertise and professional judgment. This section provides a general overview on two approaches for estimating savings: the estimation of water savings by individual activities; or estimations based on per capita water demand data. These approaches may be used individually or combined (estimates of individual activities could be used to ground truth the per capita demand based estimates or vice-versa).

¹¹ Although there is not a standard method, percentages may be expressed as the volume water saved divided by the total water demand prior to implementation of the water efficiency activity.



Water Saving Estimates of Individual Activities

Water savings may be estimated by reviewing each individual demand management activity and summing the savings to determine the total water savings. [Worksheet B](#) provides a format to record these savings for those who choose to use this approach. The water savings of some activities such as toilet rebates are relatively easy to estimate. For instance, a household's water savings achieved through the installation of a more water efficient toilet can be determined by multiplying the gallons saved per each flush of the new toilet by an assumed number of flushes per household. There are many resources available to estimate savings of individual activities. These include literature references, software applications, water efficiency plans from other providers that include how they did their estimates. Providers are encouraged to independently research and select technique(s) compatible with available data and resources. The CWCB also offers technical assistance through their website, and staff is also available to answer questions and provide assistance.

Despite the resources available to estimate water savings, the savings of some activities, such as those that are highly dependent on human behavior (e.g. public education programs, advertising and marketing), are much more difficult to quantify and, in many cases, cannot be estimated within reasonable accuracy. In the case of education activities, many times these activities support other water efficiency activities and enhance the savings for these activities.

According to the Guidebook of Best Practices for Municipal Water Conservation in Colorado:

Conservation outreach programs help establish a culture of wise water stewardship, which over time results in behavior change and effective action such as replacing inefficient fixtures and appliances. Conservation marketing efforts may also increase participation levels in other utility sponsored programs such as landscape audits and rebates. Don't determine the success of a water public outreach campaign based exclusively on measured changes in water use. Instead, focus on the campaign activities themselves.

In these cases, historical demand data discussed in Section 4.2 can be helpful in estimating savings on a more cumulative level.

Water Saving Estimates Using Demand Data

One common approach to estimating water savings using demand data is to compare historical annual per capita water demands to before and after the implementation of demand management activities. An example of this is shown in Figure 13 where the annual historical per capita water demands are shown in relation to when key demand management activities were implemented. The data shown in Figure 13 suggest that each of the water efficiency activities enacted from 1995 to 2009 (installation of meters with volume billing system, change to a block rate structure, and public education campaign plus other measures) has contributed to the reduction of per capita demands.

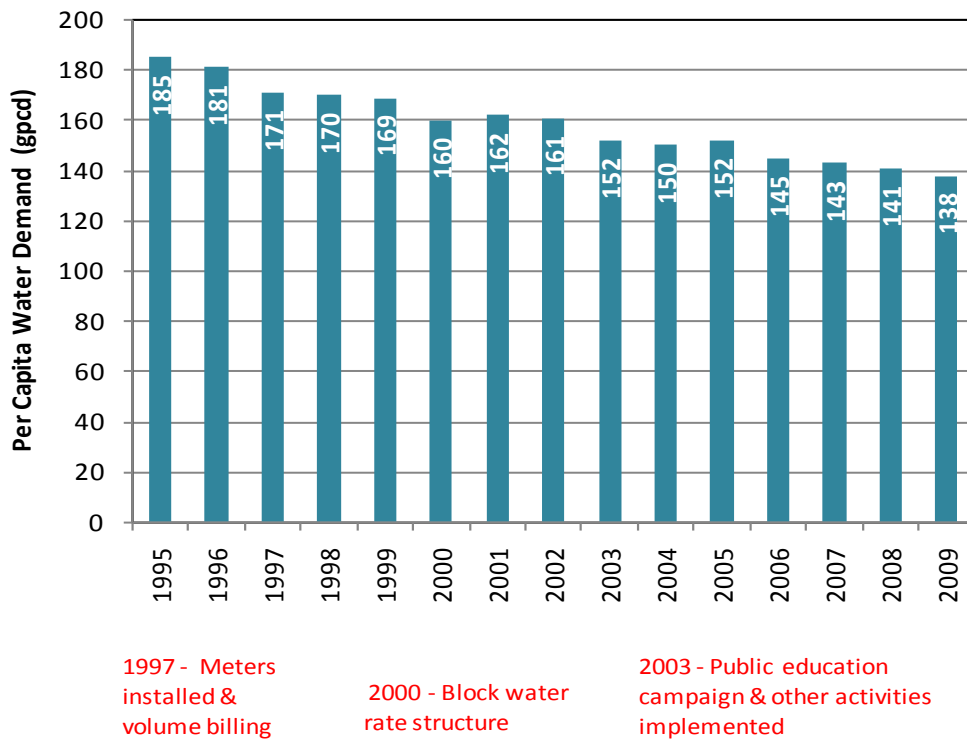


Figure 13 System-wide Per Capita Water Demands and Demand Management Savings

A similar approach may be used with per capita demand data by customer category to determine the savings for demand management activities that focus on targeted sectors. For instance, residential demand data may be used to assess the effectiveness of demand management activities in the residential sector. Indoor and outdoor demands are key to estimating savings for indoor and outdoor activities, respectively.

The shortcoming of strictly comparing per capita demands to the implementation of demand management activities is that it does not account for other factors that can influence water demands. For instance, drought restrictions can significantly lower water demands. Many water providers throughout Colorado experienced a significant reduction in per capita water demands following the 2002 drought which, as of 2010, had not returned to pre-2002 levels. High or low levels of precipitation during the summer irrigation season can also significantly reduce or increase demands. For some communities, economics and tourism can significantly impact demands. When the economy is good, the number of visiting tourists and consequent water demands significantly increase. This can add greater complexity when estimating water savings.

In order to understand the full extent of water savings, it is essential that providers consider and address the above factors when estimating water savings. For providers that do not have the data and/or resources to do an in depth analysis, this may simply involve a qualitative discussion of these elements entailing how they have historically influenced demands and contributed to the uncertainty of water saving estimates. Quantitative estimates based on more sophisticated techniques, such as statistical analyses, can be very useful when sorting through numerous variables and assigning water savings to particular measures.



Figure 14 provides a hypothetical example of a more sophisticated quantitative analysis showing actual historical per capita demands and normalized per capita demands independent of weather variables. These normalized per capita demands were based on a statistical analysis using 80 years of hydrology and weather data. In this case, the normalized per capita demands will provide a much more robust estimate of water savings than the actual historical per capita demands.¹²

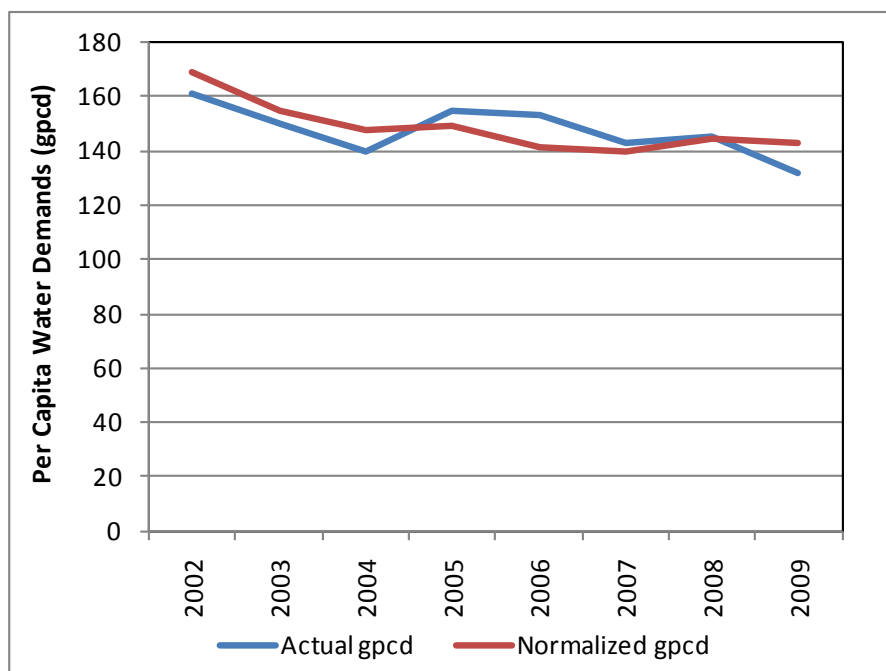


Figure 14 Actual and Normalized Per Capita Water Demands

Passive and Active Water Savings

Demand management water savings comprise active savings and passive savings. Passive savings are a result of replacing older less water efficient fixtures and appliances with newer more water efficient fixtures and appliances. This naturally occurs over time as fixtures age.¹³ Demand management activities that promote the replacement of old inefficient indoor fixtures and appliances (e.g. toilet and washing machine rebates) essentially accelerate the timing of when the savings will occur. Active savings are a result of the implementation of demand management activities. Distinguishing active and passive historical water savings can provide valuable insight into the active water savings directly attributed to demand management activities.

¹² It is worth noting that when sizing for facilities, providers often use peak demands (e.g. peak-day or peak-hour). In contrast to the normalization technique addressed above, peak demands should incorporate weather influences. In addition, while normalization techniques may be useful to differentiate water savings attributed to water efficiency activities relative to weather patterns, it is important to consider weather patterns when projecting future outdoor demands.

¹³ Several key legislative acts have or will influence the rate and type of fixtures and appliances that will be replaced. These include the 1992 National Energy Policy Act, 2002 California Energy Commission (CEC) Water Efficiency Standards, 2007 California Assembly Bill 715, and the 2009 US Department of Energy State Energy Efficient Appliance Rebate Program.



Passive savings are dependent on the age of the housing stock, current and future per capita water use, and the timing of fixture and appliance replacement. There are many techniques to estimating historical passive savings and active savings ranging in levels of sophistication. For example, a statistically significant survey or data logging exercise could be conducted on residential homes to inventory the type and number of fixtures and appliances replaced in relation to the age of each home. Census data may be used to identify the ages of each home. This information could be combined with retrofit water saving estimates to develop passive water saving estimates for the residential sector.

An alternative, less sophisticated, approach is shown in Figure 15 where the downward trend in indoor per capita water demands is assumed to be a result of passive savings. In this example, per capita water demand decreased by 7.3 % from 2002 to 2009, resulting in an annual average passive water savings rate of 0.9%. This calculation is shown in Equation 3. This “annual indoor water demand trend” approach may be appropriate for providers who have experienced a decreasing trend in indoor per capita water usage.¹⁴

Equation 3:

$$\text{Passive water savings rate (0.9\%)} = \frac{(55 \text{ gpcd} - 50 \text{ gpcd}) / 55 \text{ gpcd}}{\text{Number of years (8 years)}} \times 100$$

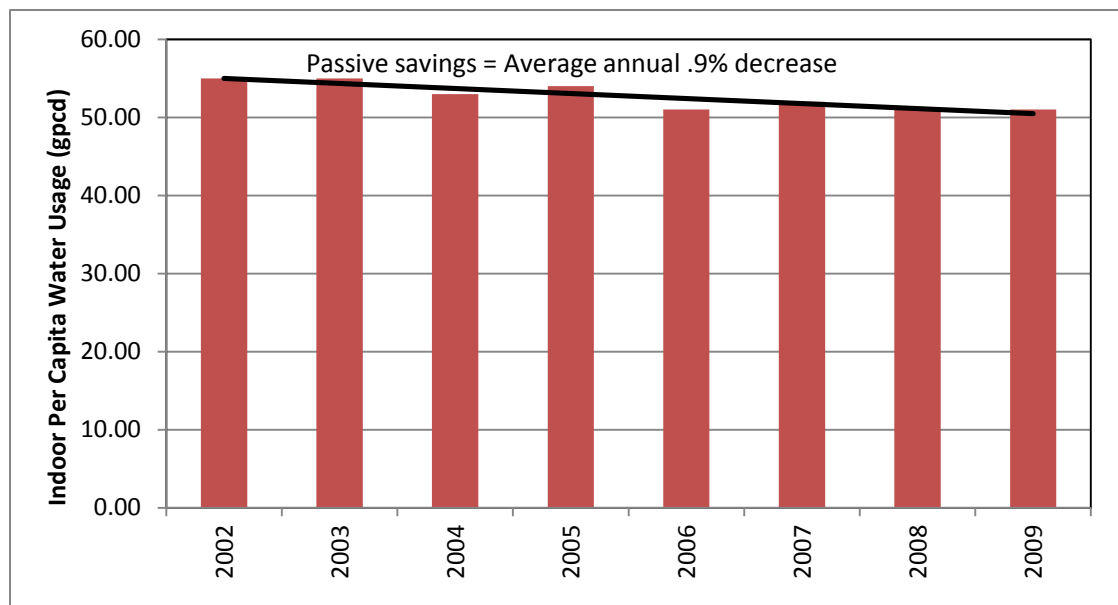


Figure 15 Indoor Per Capita Water Usage and Passive Savings Estimate

¹⁴ This approach will not be applicable for all providers. Indoor demand data may or may not have a downward decreasing trend. Factors that influence demand data are complex and while a provider may be receiving the benefits of passive water savings, it may be counteracted by other factors. Additionally a downward trend can also reflect changes in customer behavior and other factors that are not directly related to passive savings.



4.2.4 Demand Forecasts

Forecasting future water demands is critical to ensuring that there are sufficient future reliable water supplies. An initial step to forecasting demands is to determine a planning horizon. Planning horizons should be of the duration where forecasted future demands can be estimated to a reasonable level¹⁵ of certainty, while also capturing the anticipated timing of facility modifications and water supply purchases. These forecasted demands will be used in Step 3 to identify potential facility and water purchase changes as a result of water efficiency efforts.

While water efficiency planning uses a relatively short planning horizon, water supply planning and capital improvement project planning generally use a longer planning horizon. While these planning horizons are not usually directly comparable, water efficiency planning can be viewed within this longer time frame in terms of multiple planning periods fitting into the longer water supply view.

When deciding upon a planning horizon, it is helpful to also consider the timelines of when the water efficiency plan will be updated and the frequency of monitoring. Figure 16 provides an example of a plan that was developed in Year 1 with a planning horizon of ten years, an update in Year 7,¹⁶ and an annual monitoring review. Changes to the demand forecasts and planning horizon can be made on a routine basis and should at a minimum be reviewed and considered for revision during the future plan update.

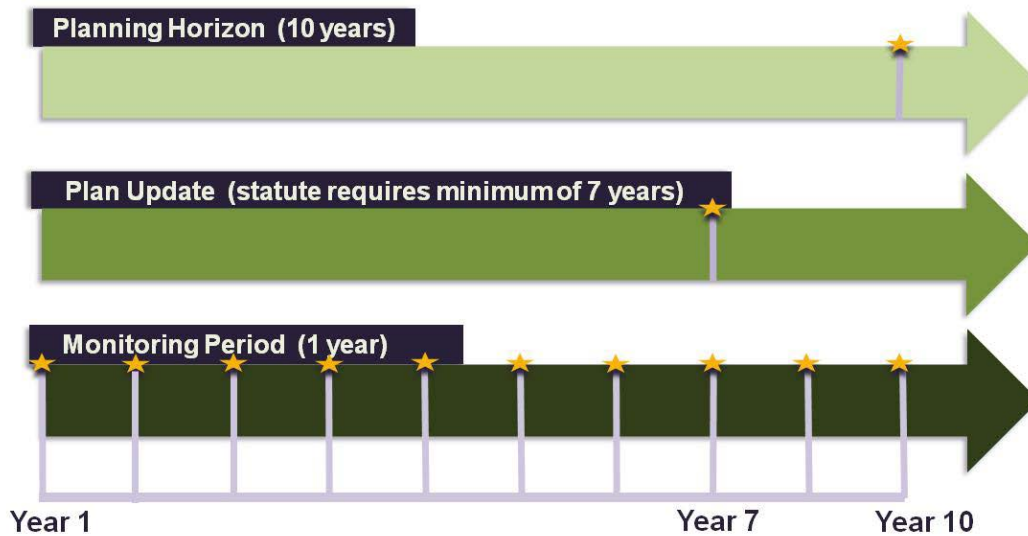


Figure 16 Example of Timelines for a Planning Horizon, Plan Update and Monitoring

Water demand forecasts can range from simple projections based on per capita water demands and anticipated population growth in the service area to complex models using population, land development data and other variables. Figure 17 provides a common approach to forecasting

¹⁵ The longer the duration of the planning horizon, the greater the uncertainty. For instance, the uncertainty of forecasted demands within a 30-year planning horizon will be much higher than forecasted demands within a 10-year planning horizon.

¹⁶ State Statute HB 04-1035 requires that all plans are updated at a minimum of every seven years. See Section 3.1 for additional information.



water demands, where a representative system-wide per capita water demand is selected (based on historical data and professional judgment) and applied to population projection data. It is important to note that factors such as economic conditions and climate change may also be considered when developing demand projections. Demand projections should be revisited on a regular basis to ensure that they are reflective of current available data. Providers who do not have a standard approach to forecasting demands are encouraged to research various methods to identify an approach suitable to meet their individual system water efficiency planning needs.¹⁷ CWCB staff is available for technical assistance.

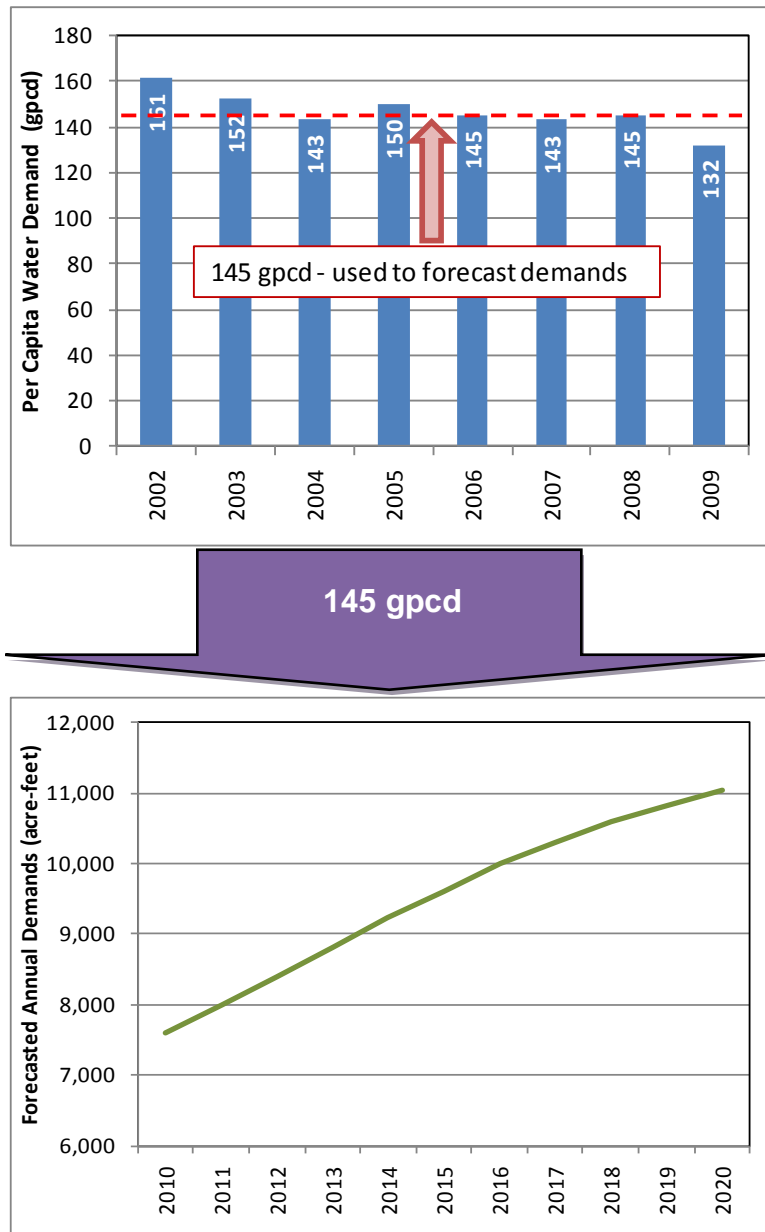


Figure 17 Demand Forecasts Using Per Capita Water Demand

¹⁷ It is important to note that per capita demands are influenced by a variety of factors including weather, economic conditions and the number of vacancies. These factors should also be accounted for when projecting water demands.



The demands presented in this section are “unmodified” demands, meaning that they do not incorporate the new water efficiency activities selected in Step 4, yet reflect the existing “status quo” where the savings achieved through the current and existing water efficiency efforts are assumed to continue into the future. Essentially, this assumes that the provider does not make changes to its existing water efficiency efforts.

For dual water supply systems, it is important to not only consider the future demands of treated water supplies, but also for future non-potable supplies. Figure 18 provides an example of unmodified forecasted demands for a dual water supply system.¹⁸

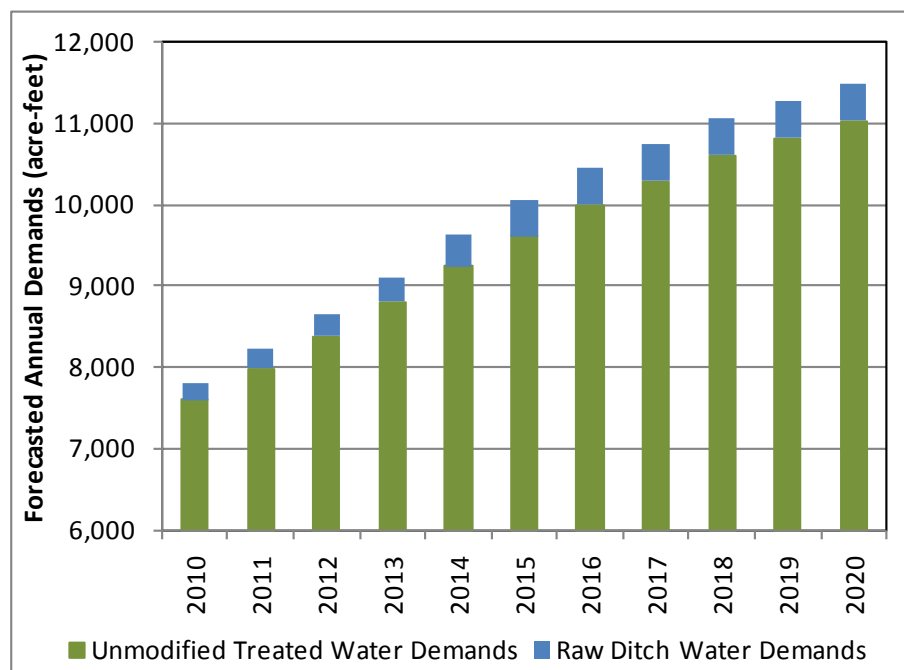


Figure 18 Unmodified Annual Forecasted Demands for a Dual Water Supply System

4.3 Step 3 – Integrated Planning and Water Efficiency Benefits and Goals

Step 3 demonstrates how water efficiency planning is essential for water supply planning and meeting future water supply needs. Information is presented on how water efficiency planning can be incorporated into water supply and reliability planning, potential water efficiency benefits, and the corresponding types of goals that should be developed to ensure that the benefits are achieved. It is important to note that Step 3 cannot be fully completed until Step 4 is finalized. Specific details are provided below.

4.3.1 Water Efficiency and Water Supply Planning

Water efficiency may be incorporated into water supply planning at a variety of levels. Providers who have established long-term water efficiency activities with data supporting long-

¹⁸ Many raw water systems in Colorado are currently not metered. Prior to implementing water efficiency activities on raw water usage, it is recommended that the raw water system is sufficiently metered. This will enable the effectiveness of future water efficiency activities to be monitored. See Section 4.1 for additional information.



term water savings may have the degree of certainty necessary to directly incorporate projected water savings into their future planning efforts. For instance, these providers may adjust the anticipated timing of when a new water treatment facility is constructed based on forecasted demand data that incorporates projected water efficiency savings. Water savings achieved through water efficiency activities can reduce water demands to such a level that the following benefits may be achieved:

- Eliminate the need for a project (e.g. water or wastewater treatment plant).
- Downsize a project based on reduced capacity needs.
- Postpone a project.
- Eliminate, reduce, or postpone water acquisitions.

Per C.R.S. 37-60-126 (4), State approved plans must express whether projected water efficiency savings are directly incorporated into planning efforts or whether additional monitoring data and level of certainty in the projected water use saving estimates is necessary prior to such incorporation. In other words, having the confidence of the permanency of the water efficiency savings can dictate whether or not more verification is needed to ensure there are sufficient savings available for postponing the timing of a new water treatment facility or using those savings for a drought reserve.

*C.R.S. 37-60-126 (4)
Requirement: Statement of
the provider's best judgment
of the role of water
efficiency plans in the
covered entity's water
supply planning.*

Regardless of whether water efficiency savings are to be directly incorporated into future supply planning, it is essential that the following exercises are conducted to obtain an idea of potential future demands if the projected water efficiency savings are fully achieved:¹⁹

- Develop modified water demands that incorporate savings from water efficiency activities.
- Assess potential impacts to future facility and/or water purchases as a result of water efficiency.

Forecasted Modified Water Demands

Forecasted modified water demands reflect the estimated water efficiency savings from the activities selected in Step 4. These modified water demands are developed by reducing the unmodified demands in Step 2 by the estimated water saving achieved through the demand

¹⁹ Following this exercise, some providers may feel water efficiency is not necessary beyond the foundational level of activities (e.g. leak repair). These providers must clearly demonstrate their rationale and provide data supporting their case. For example, water provider “Fiction District” has a customer base that does not support the investment in water efficiency and the District has a reliable water supply that will extend at least 30 years into the future. In this case, “Fiction District” should include in their water efficiency plan future demand and existing supply data to clearly demonstrate their ability to meet future demands and also provide supporting evidence that the majority of their customer base is not interested in investing in certain water efficiency activities at this time.



management activities selected in Step 4. Figure 19 provides an example of the unmodified treated water demands presented in Section 4.2.4 and the corresponding modified forecasted treated water demands.

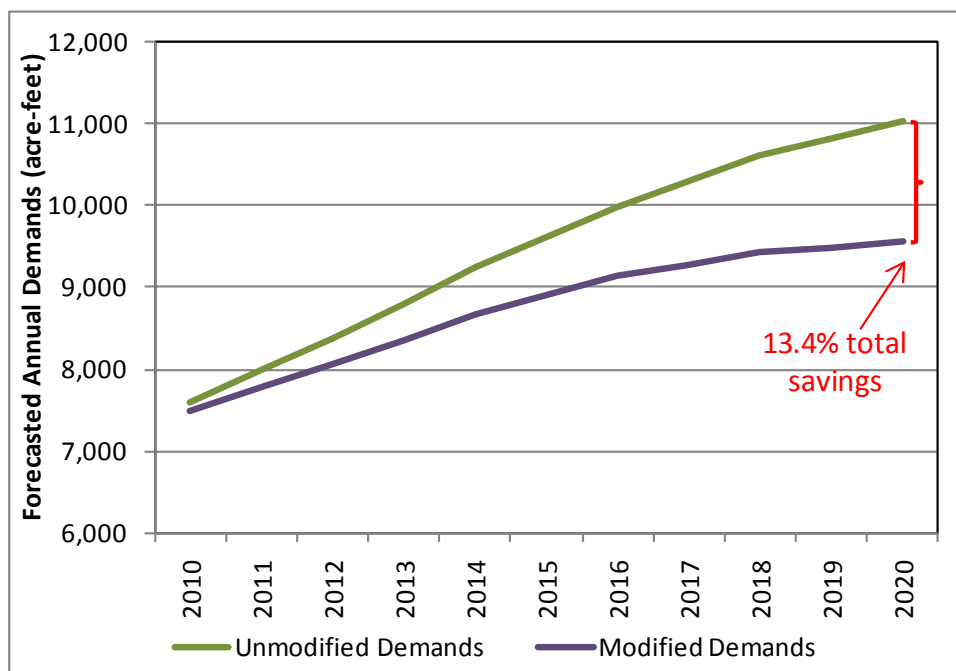


Figure 19 Unmodified and Modified Treated Water Demands

Forecasted modified demands may also be developed for dual water supply systems. This can be useful for future planning efforts where demands for certain types of supplies (e.g. raw ditch and/or re-use supplies) can be distinguished, and facilities necessary for each type of water can be planned for sufficiently.²⁰

Forecasted Modified Demands with Passive and Active Water Savings

Forecasted modified water demands may also distinguish between projected passive and active savings. Figure 20 provides an example of projected passive and active water savings. In this example passive savings are assumed to be 9.9% and active savings are estimated at 3.5% by the end of the planning horizon in 2030. This information enables the provider to identify savings that will eventually occur regardless of active demand management activities. These passive savings could affect the range and scope of active saving programs.

²⁰ Many raw water systems in Colorado are currently not metered. Prior to implementing water efficiency activities on raw water usage, it is recommended that the raw water system is sufficiently metered. This will enable the effectiveness of future water efficiency activities to be monitored. See Section 4.1 for additional information.

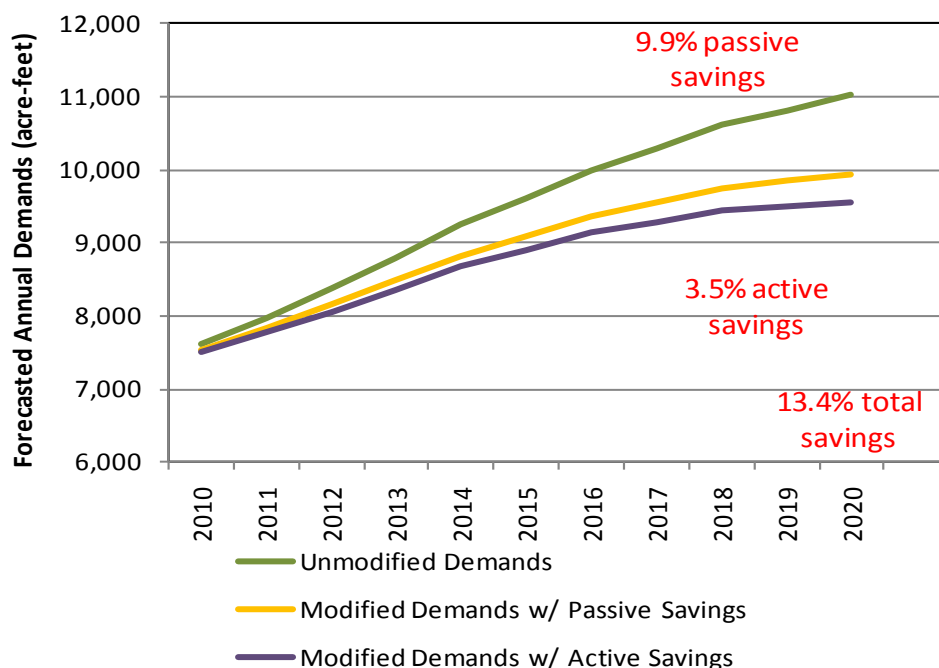


Figure 20 Forecasted Unmodified Demands Showing Active and Passive Savings

As with the estimates of historical passive savings addressed in Section 4.2.2, there are many techniques ranging in levels of sophistication that could be used to project future passive savings. One approach is to take an inventory on the age of existing homes and categorize the homes into groups depending on the age, size, and type of home (e.g. single-family vs. multi-family). Estimates on the rate of fixture replacement for each group could be estimated and then applied to the number of homes per group. The sum of these group estimates would be future residential passive water savings.

Impacts to Future Water Facilities and Supply Acquisitions

As previously mentioned, reducing water demands through water efficiency can result in the avoidance, downsizing, or postponement of water supply and wastewater facility improvements as well as eliminating, reducing, or postponing water purchases. The forecasted modified water demands should be compared with the timing and sizing of planned facility improvements to determine if such changes are possible and appropriate. [Worksheet C](#) provides a means to record estimated costs of the facility needs and water right acquisitions, dates of when construction/acquisition is anticipated, and potential changes, assuming success of the water efficiency plan, including potential cost savings.

This information is generally available from existing facility plans, water supply master plans, or other planning documents. Some providers may have sufficient data and planning certainty to benefit from a cost comparison between the costs of supply-side capital/water acquisition modifications to the cost of water efficiency activities. The potential cost savings should be compared to the cost of the water efficiency program to determine overall costs/benefits.



Providers who have a high degree of confidence in their water efficiency water savings/modified water demands should directly incorporate their findings into other water planning efforts, such as a capital improvement plan and water right purchases. Providers with lesser degrees of confidence should include their findings as potential future changes and closely monitor their water efficiency program. An example of this approach is as follows:

“If the targeted water savings are achieved within the next seven years, the anticipated 10 mgd water treatment plant expansion planned for 2018 could be reduced by 5 mgd which would provide a cost savings of \$20 million in 2011 dollars. This potential reduction will be reassessed in 2016, following five years of monitoring the success of the water efficiency plan.”

4.3.2 Water Efficiency Benefits

Water efficiency benefits address the anticipated results of a successfully implemented plan. Information provided in this section can be important to convey to the public ratepayers on why the provider/municipality is expending resources to plan and implement a water efficiency program.

As discussed in Section 4.3.1, lowering water demands as a result of water efficiency can assist providers in avoiding, downsizing, or postponing the construction and operation of water supply facilities and wastewater facilities as well as eliminate, reduce, or postpone water purchases. In addition to these water supply benefits, there are other societal, political, and environmental benefits. Examples of such benefits include:

- Lowering customer water bills.²¹
- Reduction of wastewater discharges through indoor water savings which can improve water quality and aquatic habitat.
- Reduction of outdoor irrigation runoff which can improve water quality.
- Demonstrating commitment to sustainability.
- Meeting political and regulatory requirements necessary to obtain permitting for local and regional water supply projects.
- Demonstrating leadership to the community that being more efficient is the right thing to do in an arid environment.
- Lowering operational costs such as pumping and water treatment.
- Lowering amount of chemicals needed to treat water.

²¹ While this may be a societal benefit where the end-use customer uses less water and consequently has a lower water bill, it is important to note that this can reduce the provider’s revenue which if not properly planned for, can inadvertently require the provider to increase water rates in subsequent years to mitigate for revenue shortfalls.



- Providing “insurance” for the uncertainties involving climate change.
- Meeting community expectations for sustainable water use.

Benefits may also be reflected in how the “saved water” is used. Depending on a provider’s water supply portfolio and situation, saved water can be used in the following ways:

- *Conserve water for future generations* – Saved water can be a less expensive option than acquiring new supplies for future growth and result in less environmental consequences.
- *Leases to agriculture* – This supports the agriculture sector and can generate additional revenue for the municipality.
- *Drought protection* – Saved water can be stored for later use during a drought. This in turn improves water supply reliability without having to purchase additional water.
- *Instream flows* – Saved water may remain in the stream. This can increase flows in particular reaches of the stream.

Many of these example benefits can be instrumental in developing general campaign messages for educating the public on the importance of water efficiency. Messages can be conveyed in such a manner to “personalize” why a customer should make the effort to conserve water by explaining how the customer, society, and environment at large can be positively impacted.

4.3.3 Water Efficiency Goals

While the water efficiency benefits address “What the needs of the water system are,” the water efficiency goals address “How the needs will be taken care of.” The water efficiency goals are intended to lay out a set of targeted objectives that if accomplished, will result in the identified benefits.

As discussed earlier in this section, a preliminary set of goals should be developed prior to the Step 4 selection of the water efficiency activities. These preliminary goals provide a means to screen and evaluate the selected activities. The goals may then need to be modified following Step 4 to ensure that they are realistic from an implementation perspective.

The goal development process should be a collaborative effort between water provider staff and possibly incorporate stakeholder input. If applicable, goals in the previous water efficiency plan should be assessed and incorporated into the new goal development process. Goals should be both qualitative and quantitative and be achievable and reasonable within a specified time frame. The success of the goals should be measurable, through either a qualitative or quantitative method, to determine whether the goals are sufficiently being met.

It is recommended that the goals incorporate the following:

- Targeted water savings. This can be expressed as a percentage, absolute amount (AF), or as a gallons per capita per day amount (gpcd).



- Water savings for targeted customer categories.
- Targeted water savings from system water loss control management.
- How the successes of the goals are intended to be measured. (Successes are to be tracked through monitoring which is discussed in Section 4.5.2.

Table 8 includes ideas, examples, and means to measure the success of goals.

Table 8 Water Efficiency Goals

Ideas for Goals	Examples	Measurement of Success
Water saving targets for certain customer category(ies)	<ul style="list-style-type: none"> ▪ Reduce residential per capita water usage by 10 gpcd. ▪ Gain a better understanding of how commercial customers use water in order to reduce water use. 	<ul style="list-style-type: none"> ▪ Monitor billing data (water demands).
Water saving targets for largest users	<ul style="list-style-type: none"> ▪ Identify largest residential water users and reduce water usage by 10%. ▪ Coordinate efforts with college campus (largest water user) to improve water efficiency. Achieve 15% water savings. 	<ul style="list-style-type: none"> ▪ Monitor billing data (water demands).
Provider's role in water conservation	<ul style="list-style-type: none"> ▪ Be recognized as a local leader in water efficiency by achieving relatively high water savings for the local area. ▪ Develop innovative water efficiency strategies 	<ul style="list-style-type: none"> ▪ Achieve CWCB grant funding for several innovative water efficiency activities that have not been done before.
Improve monitoring	<ul style="list-style-type: none"> ▪ Establish a monitoring system that collects a sufficient amount of data to effectively measure the success of water efficiency activities on an annual basis. 	<ul style="list-style-type: none"> ▪ Effectively implement monitoring plan
Cost effectiveness	<ul style="list-style-type: none"> ▪ Develop a water efficiency program that meets budget constraints, yet achieves water saving targets. 	<ul style="list-style-type: none"> ▪ Demand and accounting data
Public acceptance	<ul style="list-style-type: none"> ▪ Implement water efficiency activities that are compatible with the community. 	<ul style="list-style-type: none"> ▪ Public survey on conservation activities
Lower peak day use	<ul style="list-style-type: none"> ▪ Reduce summer daily peak demand water usage by 10%. 	<ul style="list-style-type: none"> ▪ Daily water treatment plant production data.
Water use of new development	<ul style="list-style-type: none"> ▪ Lower per capita use for all newly constructed development post 2010. 	<ul style="list-style-type: none"> ▪ Billing/demand data for all new construction post 2010
Passive savings	<ul style="list-style-type: none"> ▪ Accelerate passive savings through retrofits of fixtures and appliances 	<ul style="list-style-type: none"> ▪ Estimates of passive savings over the next 10 years
Estimates of residential indoor water savings	<ul style="list-style-type: none"> ▪ Reduce residential indoor water use by 20%. 	<ul style="list-style-type: none"> ▪ Estimates of indoor water savings
Estimates of residential outdoor water savings	<ul style="list-style-type: none"> ▪ Reduce residential outdoor water use by 20%. 	<ul style="list-style-type: none"> ▪ Estimates of outdoor water savings
Relationships	<ul style="list-style-type: none"> ▪ Develop and maintain collaborative relationships that promote efficient water use throughout the region. 	<ul style="list-style-type: none"> ▪ List of new and existing relationships that are actively being maintained.



Ideas for Goals	Examples	Measurement of Success
Sustainability	<ul style="list-style-type: none"> Implement water efficiency activities that are sustainable from an economic, social and environmental perspective. 	<ul style="list-style-type: none"> Accounting data Public survey Means in which conserved water is being used to sustain/improve environment
Water rate structure	<ul style="list-style-type: none"> Maintain a fair and equitable water rate structure that promotes efficient use while maintaining sufficient revenue. 	<ul style="list-style-type: none"> Revenue remains sufficient and per capita demands are reduced. Demand data.
Drought management	<ul style="list-style-type: none"> Implement water efficiency activities that also provide drought mitigation 	<ul style="list-style-type: none"> Select and implement water efficiency activities that also provide drought mitigation. Monitor effectiveness of these activities.
Non-Revenue water	<ul style="list-style-type: none"> Reduce non-revenue water by improving metering and leaks. 	<ul style="list-style-type: none"> Water audit of distribution system to measure leakage and actions taken to improve metering.
Water efficiency and future water resources planning	<ul style="list-style-type: none"> Incorporate water efficiency into water resources planning. 	<ul style="list-style-type: none"> Include projected water savings through water efficiency activities in the upcoming revision to the Raw Water Master Plan.
Public involvement	<ul style="list-style-type: none"> Educate the public on the value of water. Foster a water efficiency ethic. 	<ul style="list-style-type: none"> Survey conducted before the education campaign and after five years of the campaign to assess differences.

4.4 Step 4 – Selection of Water Efficiency Activities

Step 4 focuses on the selection and full evaluation of the water efficiency activities for implementation. According to C.R.S. 37-60-126 (4), a requirement for developing a plan includes the full evaluation of various plan elements. This section introduces a recommended four-phased approach, shown in Figure 21, for selecting and fully evaluating an effective portfolio of water efficiency activities with accompanying supporting information and optional worksheets. The four phases include: 1) assessment; 2) identification; 3) qualitative screening; and 4) evaluation and selection. Details of the four-phase process are provided below.

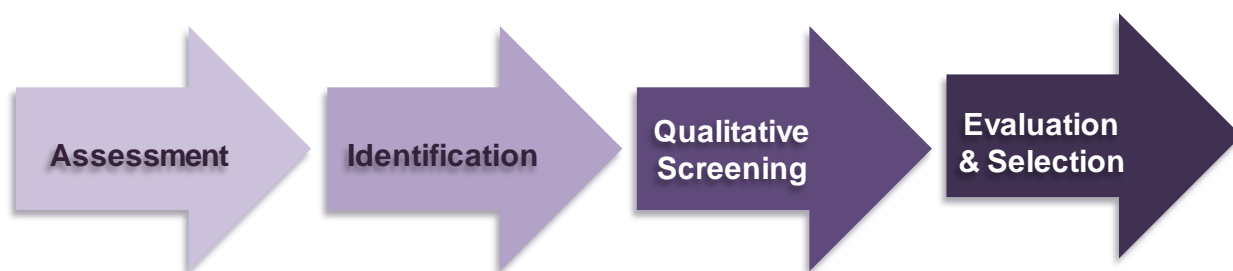


Figure 21 Four-Phase Approach to Selecting Water Efficiency Activities

Phase 1: Assessment – Collection of general information on the provider’s former water efficiency activities and other aspects of their water supply system and service area. This



information may be used to identify areas where water efficiency could be improved. Key questions that can assist with this process are provided in the following subsections. The answers do not necessarily need to be documented, but should serve as a means to identify and refine the understanding of the water supply system's needs prior to identifying water efficiency activities for analysis and potential implementation.

Phase 2: Identification – Incorporates information from the assessment phase to identify a list of water efficiency activities that are generally compatible with the provider's system and needs. This list should include activities implemented in the past as well as additional activities that may be beneficial. Details such as implementation costs and potential water savings do not need to be of great consideration at this point. If there is a possibility that a certain activity may be beneficial, it should be included in the preliminary identification list for consideration. [Worksheet D](#) may be used to assist with this process.

Phase 3: Qualitative Screening – Involves the development of qualitative screening criteria used to screen the preliminary list of activities. Activities that do not sufficiently meet the screening criteria should be eliminated while the remaining activities should be carried forward into the next phase. It is recommended that at least three to four screening criteria be developed. Some or all of these criteria should reflect the qualitative goals developed in Step 3. For example, if a goal is to reduce the need for new supplies to meet peak seasonal demand, a screening criterion could be "contributes to the reduction of summer peak demands." A variety of measures that reduce irrigation water demand such as xeriscaping, water-efficient irrigation equipment, and improved irrigation scheduling would fit this criterion.

Examples of qualitative screening criteria include:

- Beneficial from a political perspective.
- High public acceptance.
- Implementable from a staff/resource perspective from initial qualitative overview.
- Technically feasible from initial qualitative overview.
- Likely to be adopted at a regulatory level (no legal issues or constraints).
- High likelihood of success.
- Economic viability/cost effectiveness.
- Sufficiently reflects goals developed in Step 3.

This phase should be conducted at a high qualitative level where activities not meeting basic criteria are eliminated. [Worksheets E-G](#) may be used to assist with this process.

Phase 4: Evaluation and Selection – This involves the development of the evaluation criteria, evaluation of the activities, and selection of the final activities for implementation. Activities



that do not sufficiently meet the criteria should be eliminated while the remaining activities may be selected for implementation. The evaluation criteria should be reflective of the qualitative and quantitative goals developed in Step 3, include estimates of implementation costs, and where possible, water saving estimates. [Worksheet H](#) may be used to assist with this process.

The criteria should also take into consideration the system-wide collective effects of the remaining candidate activities. Examples of such criteria include:

- Candidate activities collectively reflect goals developed in Step 3.
- Candidate activities collectively meet the targeted savings specified in Step 3.
- Implementation costs are feasible from a financial and staff resource perspective (e.g. budget and time).
- Practical from a cost/benefit standpoint.
- Candidate activities are logically sequenced using the SWSI Framework levels.
- Candidate activities collectively target appropriate customer categories.
- Candidate activities are complementary to each other (e.g. work well together).

*C.R.S. 37-60-126 (4)
Requirement: Either as a percentage or in acre-foot increments, an estimate of the amount of water that will be saved through water efficiency when the plan is implemented.*

It is important to note that according to C.R.S 37-60-126(4), all State approved plans must include an estimate of the amount of water that will be saved through water efficiency efforts as a percentage²² or in acre-foot increments. These estimates should represent annual projected savings of each individual activity or at a minimum, the projected savings of each relevant SWSI Levels Framework category level introduced in Section 4.4.1 (e.g. Ordinances and Regulations - Level 1).

Plans should also include a brief summary of this four-phase process and a list of the final activities selected. Detailed intermediary results of the four-phased process may be presented in an appendix using tables and brief narrative. [Worksheets D-H](#) can be used to develop these tables.

4.4.1 Demand Management Activities

For purposes of this Guidance Document, the water efficiency activities are organized according to the SWSI Levels Framework. The SWSI Levels Framework was developed as a component of the 2010 SWSI update to organize demand management activities into a model that assists municipalities in prioritizing and selecting water efficiency activities.

²² Although there is not a standard method, percentages may be expressed as the volume water saved divided by the total annual water demand.



The SWSI Levels Framework selection process provides the following advantages:

- Prioritizes and selects activities that make sense from a business perspective by initially focusing on the Foundational Activities.
- Limits amount of documentation necessary for the intermediary assessment, screening, and evaluation phases through a series of worksheets.²³
- Focuses on the documentation of the selected activities which are most essential to implementation.

Additionally, this framework will be used by the State to assess statewide municipal conservation through SWSI and the Inter Basin Compact Committee (IBCC) process. The framework may be represented as a cylinder consisting of the following four categories in Figure 22.²⁴

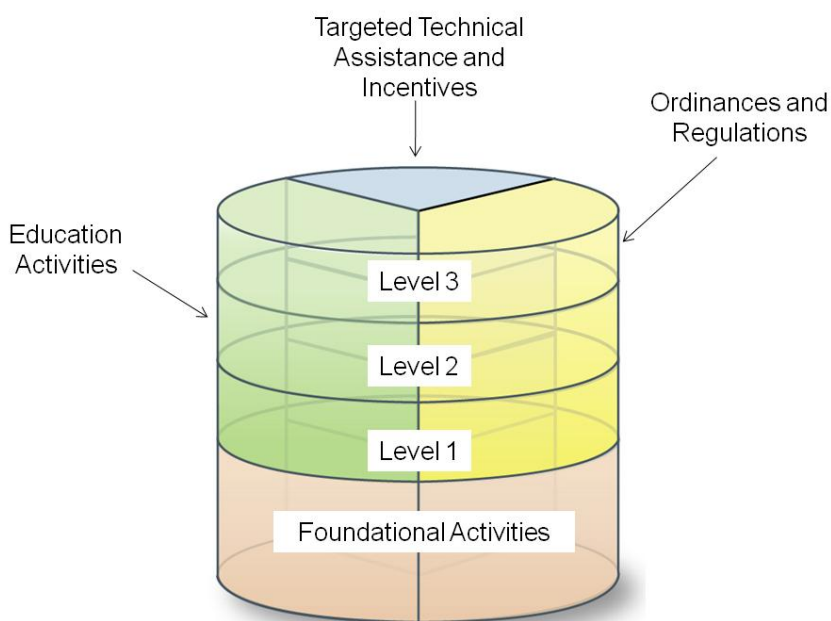


Figure 22 SWSI Levels Framework

- *Foundational Activities* – The base of the cylinder shown in Figure 22 comprises the foundational activities common to effective plans. It is recommended that providers have these foundational activities in place prior to undergoing other extensive activities.

²³ Worksheets D through I coincide with the SWSI Framework selection process and are designed to document the intermediary screening and evaluation phases. The worksheets can simply be filled out and put into Plan appendices, reducing the efforts necessary to document the intermediary phases.

²⁴ These categories were initially introduced the 2010 SWSI Conservation Level Analysis Final Report as a component of CWCB's water conservation technical platform. Note: The SWSI Levels Framework terminology has been updated since this report.



- *Targeted Technical Assistance and Incentives* – A collection of activities that rely on indoor water efficient technologies and water-wise outdoor practices. These activities may be implemented on three levels based on the following type of targeted customers: 1) utility/municipality facility water efficiency; 2) customers with the largest water use; and 3) management of remaining customer demands.
- *Ordinances and Regulations* – A series of ordinances and regulations that promote or enforce water efficiency. Similar to the Targeted Technical Assistance and Incentives, Ordinances and Regulations may be implemented on three levels based for the following targeted groups: 1) existing service area; 2) ordinances for new construction; and 3) ordinances for point of sale of existing building stock.
- *Education Activities* – Variety of techniques and venues to convey water efficiency information to the public. These activities may be comprised of: Level 1, one-way education; Level 2, one-way education with feedback; or Level 3, two-way education. Stakeholder steering committees where information from the public is used directly for implementation of water efficiency activities is an example of the Level 3, two-way education.

The remainder of this section lays out a systematic SWSI Levels Framework selection process for determining a final portfolio of demand management activities. This incorporates the four-phase assessment, identification, screening, and evaluation and selection process introduced in Section 4.4 while also incorporating the SWSI Levels Framework categories. This process is shown in Figure 23 where the Foundational Activities are initially selected followed by the Targeted Technical Assistance and Incentives, Ordinances and Regulations, and Education.

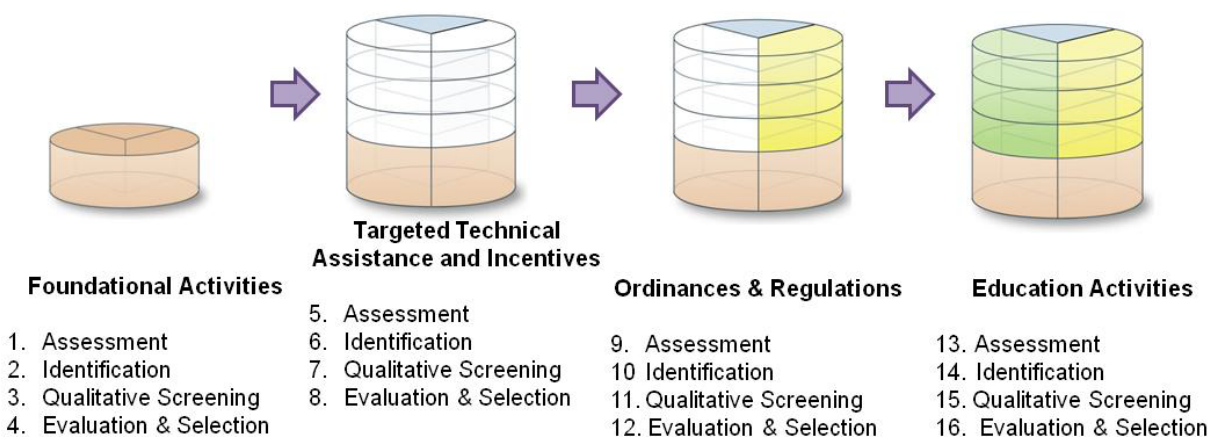


Figure 23 SWSI Framework Selection Process

Foundational Activities

As previously mentioned, Foundational Activities should be in place prior to implementing other activities. They focus on system operations and water efficiencies, are under the provider's direct control, and can significantly improve the effectiveness of the overall water efficiency plan by ensuring sufficient metering and data tracking. These activities are grouped into the



categories shown in Figure 24 and detailed information on each of these groupings is provided below. [Worksheet D](#) provides a comprehensive list of individual activities for each group.

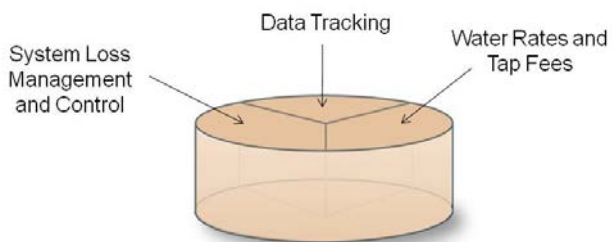


Figure 24 Foundational Activities

Data Tracking – Metering and Demand Data Collection

While metering and data collection may not directly result in water savings, it makes sense from a practical business perspective to initially invest in a means to track water usage and identify areas where water efficiency can be improved. These areas can then be targeted with other demand management activities.

The majority of Colorado’s municipal water supply systems are now metered. However, meter testing as well as meter upgrades can be an important component to managing water use. Large multi-family units and raw water systems (non-treated water for irrigation purposes) are often not metered and are an area for improvement. Additionally, metering not only provides information on customer usage, but is essential for measuring non-revenue water.

Demand data collection is an important component to the monitoring effort addressed in Section 4.5.2. However, it is also included here in the Step 4 activity selection process to emphasize the importance of demand data. Billing systems have traditionally been used for water billing purposes. However, as billing system functionality has increased so have the opportunities for increased demand data collection. Billing systems often dictate the type of demand data available for monitoring purposes. For example, systems that are able to track and record water use by multiple customer categories (e.g. residential, commercial, municipal facilities and irrigation) on a monthly basis can provide a much more comprehensive data set for monitoring purposes than billing systems that are limited to one or two customer category designations. According to C.R.S. 37-60-126(4), billing systems designed to encourage water efficiency in a fiscally responsible manner shall be fully evaluated for implementation. This may include improvements or upgrades to the existing billing system to improve data collection.

*C.R.S. 37-60-126(4)
Statute Requirement:
Billing systems designed to
encourage water efficiency
in a fiscally responsible
manner must be fully
evaluated.*

Water Efficiency Oriented Water Rates and Tap Fees

Water efficiency pricing has been one of the most effective methods in influencing customer behavior and reducing water use. A common water efficiency pricing structure consists of inclining block rate structures that discourage excessive customer water use. Customers are charged more money per gallon as they use more water. According to C.R.S. 37-60-126(4), a



water efficiency oriented rate structure shall be fully evaluated for implementation during the water efficiency planning process.²⁵

Some providers currently implement inclining block rate structures that do not encourage water savings. The blocks are either too large or not effectively tied to excessive water use. Alternatively, some provider's water bills have a very small percentage of the bill directly tied to water use. There are other more significant charges such as costs for new infrastructure and for securing new water supplies. In these cases, inclining block rates can be insignificant when compared to the other charges and consequently do not effectively influence customer behavior. In order for a block rate structure to be effective and considered a demand management activity, there must be noticeable difference in the pricing rates of each block to incentivize efficiency water use.

*C.R.S.37-60-126 (4)
Requirement: Water rate structures designed to encourage water efficiency in a fiscally responsible manner must be fully evaluated.*

Tap rate fees may also be used as a means to reduce water usage for new development. Various incentives could be attached to the tap fee to encourage efficient water use. For instance, new homes outfitted with water efficient fixtures and appliances could receive a discount on their tap fee.

System Water Loss Management and Control

Leaks in water distribution systems can reduce the system's effectiveness and impact overall profitability. Effective leak detection and repair is critical to a provider's overall water resource management program. However, in Colorado some small utilities and water companies have reported losses as high as 50%. These losses are a combination of apparent and real losses (non-revenue water).²⁶

C.R.S. 37-60-126 (4) requires providers to fully evaluate leak detection and repair for implementation. As general maintenance protocol, providers should have a reliable leak repair program. However, rigorous leak detection programs that proactively identify leaks throughout the distribution system are strongly recommended as well.²⁷ The most effective leak detection programs incorporate leak detection with rigorous meter testing and replacement programs as well as system-wide audits using the American Water Works Association (AWWA) standard methodology for determining water loss for municipal water providers (2009 AWWA M36 Manual of Practice – *Water Audits and Loss Control*

*C.R.S 37-60-126(4)
Requirement: Distribution system leak identification and repair must be fully evaluated .*

²⁵ Sufficient reasoning and supporting data should be provided in the screening or evaluation portion of either the plan or appendix on why a water efficiency oriented rate structure was not chosen for implementation. For instance, this include meeting minutes from a public meeting where there was significant community opposition to changes in the rate structure.

²⁶ Source: Great Western Institute. 2010. *SWSI Conservation Levels Analysis Final Report*.

²⁷ If a provider chooses to not include leak repair and/or leak detection as a foundation activity, sufficient reasoning should be provided in the screening or evaluation portion of the report or in an appendix.



Programs (3rd Edition)). System-wide audits assess real and apparent losses thus defining how much loss is from physical leaks, rather than metering inaccuracies or data errors.

Key Assessment Questions

The following key questions should be asked during the Foundational Activities Phase 1 assessment.²⁸

- Could metering be improved by installing additional meters?
- Could improvements be made to the billing system where specific desired types of demand data would be more easily accessible?
- Could improvements be made to the water rate structure or prices to promote water efficiency while maintaining a reliable revenue stream?
- Would changes in the water rate structure or individual prices be supported from a political standpoint? If not, is this an obstacle or could sufficient levels of education generate support?
- Would water rate changes be fair from an environmental justice standpoint? If not, how would environmental justice concerns be addressed?
- Have routine system-wide water audits been conducted to assess apparent and real losses in the distribution system? If so, has the provider used the AWWA M36 methodology for conducting the system-wide water audit? Are there known leaks/inefficiencies in the distribution system that could be improved?
- Are there any operational changes/adjustments that could be made to improve efficiencies?

It is recommended that the screening and evaluation phases be conducted using [Worksheet D](#) and [Worksheet H](#), respectively. These worksheets may be filled out and included in an appendix for documentation.

Targeted Technical Assistance and Incentives

The Targeted Technical Assistance and Incentives category covers various actions providers and customers can do to improve existing water efficiency. This can entail the installation of water efficient fixtures and appliances, low water use landscapes, water efficient commercial and industrial water using processes through incentives. [Worksheet E](#) provides a comprehensive list of the possible activities. Reuse of water by using reclaimed water is also considered a water efficiency activity. Reclaimed water is often used to meet a water demand that would otherwise need to be met through other first-use supplies. This saves water since the second-use reclaimed

²⁸ As discussed in Section 4.4, answers to these key questions do not need to be documented. The main purpose of the assessment process is to characterize system-wide needs and traits prior to identifying water efficiency activities for screening and potential implementation.



water reduces the amount of first-use water necessary to meet the total demands of the service area.

C.R.S. 37-60-126(4) requires that the activities specified in the call out box below are fully evaluated for implementation through the Phase 2 screening and/or Phase 3 evaluation processes. These specific activities are specified in the box below.²⁹ These activities align with the Targeted Technical Assistance and Incentives category shown in Figure 25.

C.R.S. 37-60-126(4) Requirement- The following must be fully evaluated:

- *Water-efficient fixtures and appliances such as toilets, urinals, clothes washers, showerheads, and faucet aerators*
- *Incentives to implement water efficiency techniques such as rebates to customers to encourage the installation of water efficient fixtures and appliances*
- *Low water use landscapes such as drought resistant vegetation, removal of phreatophytes and efficient irrigation*
- *Water-efficient industrial & commercial water-using processes*
- *Water reuse systems*

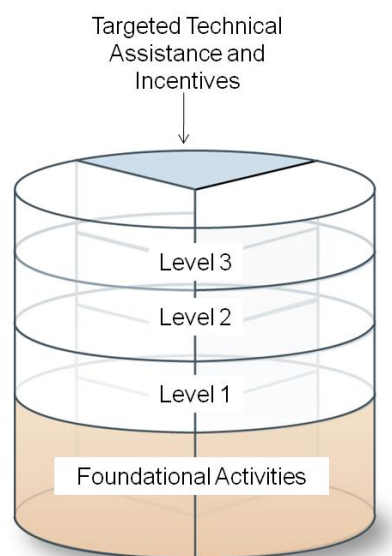


Figure 25 Targeted Technical Assistance and Incentives

Targeted Technical Assistance and Incentives may be organized according to the following levels:

²⁹ If one or more of the activities is not selected for implementation, sufficient reason should be provided why the activity was eliminated during the screening or evaluation process. These reasons must be provided directly in the report or in an appendix. [Worksheets E and H](#) can be used for this purpose. Example limitations for reuse include: a provider's water rights portfolio does not have legally reusable water, reuse is not cost effective or there is not sufficient demand for reuse at this point in time to warrant such investment. Supporting data such as a description of challenges, impracticalities of installing a reclamation system or estimated costs (these may be high order of magnitude costs) should be provided.



- *Level 1: Utility/Municipal Facility Water Efficiency* – Applies to the water use at facilities that the provider and/or municipality directly manages and has direct control over. This could include administration buildings, recreational centers, parks, etc. These facilities generally have water use patterns that can be easily characterized and managed. Improving water efficiency at these facilities positions the provider as a leader in water efficiency who is leading by example.
- *Level 2: Management of Largest Customer Demands* – Demand management activities targeting large water users can be some of the most cost effective activities. If providers have limited funds, working with fewer, but larger, water users to customize water efficiency activities can provide significant water savings relative to the financial investment. Large water user customers may consist of industrial firms (such as factories and breweries), commercial properties and the larger residential water users.
- *Level 3: Management of Remaining Customer Demands* – Demand management activities that focus on the customer service area as a whole and can be more difficult to monitor and less cost effective than focusing on the Level 1 and 2 customers, yet can result in significant savings. From a business perspective, it may make the most sense to initially focus on the Level 1 and 2 customers and then target other Level 3 customer categories within the service area.

Key Assessment Questions

The following key questions should be asked during the Targeted Technical Assistance and Incentives Phase 1 assessment. These questions can assist in focusing on target customers and appropriate level(s).³⁰

Level 1

- How water efficient are utility/municipal facilities?
- Would water audits at provider/municipal facilities provide valuable information?
- What operational changes/training can be conducted to encourage staff to save water?
- Could reuse be a means to improve water efficiency and meet future demands?

Level 2

- Who are the largest water users?
- Is there a reasonable opportunity for water savings?

³⁰ As discussed in Section 4.4, answers to these key questions do not need to be documented. The main purpose of the assessment process is to characterize system-wide needs and traits prior to identifying water efficiency activities for screening and potential implementation.



- Can water audits be performed for the largest users and would this provide useful information?
- What changes in customer water use patterns would be necessary to save water?

Level 3

- What customer categories should be targeted?
- How can these customers be targeted?
- Where can the greatest water savings be achieved?

It is recommended that the screening and evaluation phases be conducted using [Worksheet E](#) and [Worksheet H](#), respectively. These worksheets may be filled out and included in an appendix for documentation.

Ordinances and Regulations

Ordinances and Regulations (shown in Figure 26) consist of locally adopted policies that encourage water efficiency. C.R.S. 37-60-126 (4) requires Ordinances and Regulations that encourage water efficiency be fully evaluated for implementation through the Phase 2 screening and/or the Phase 3 evaluation processes. Common ordinances and regulations include water wasting policies and water restrictions.³¹ [Worksheet F](#) provides a comprehensive list of ordinances and regulations.³²

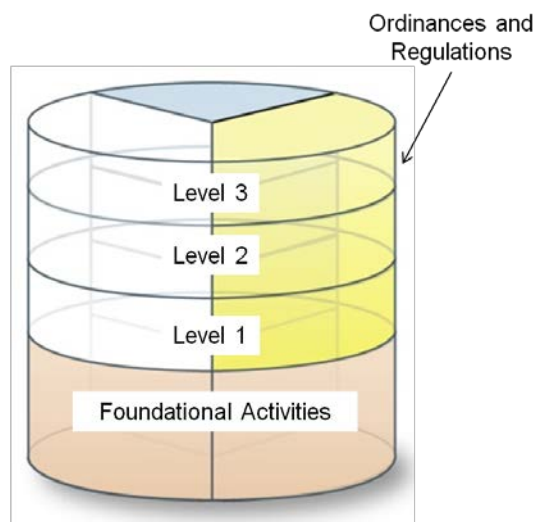


Figure 26 Ordinances and Regulations

³¹ Water restrictions are often used for drought response during a temporary water shortage. However, water restrictions may be considered a water efficiency activity if they are implemented over a long-term period to achieve a desired operational objective, such as regulating peak day water usage.

³² If ordinances and regulations are not selected for implementation, sufficient reason why should be provided. These reasons must be provided directly in the report or in an appendix. [Worksheets F and H](#) can be used for this purpose.



While ordinances and regulations have an advantage in that they can potentially penetrate 100% of the customer base (e.g. they can potentially reduce water usage for all of their customers), their overall effectiveness often depends on whether they are enforced, which in turn is dependent on the resources dedicated to enforcement. In some cases, providers are not the local government and consequently do not have the authority to adopt and enforce ordinances. This can present some challenges, yet also provides an opportunity to coordinate efforts with the local government to adopt and enforce ordinances.

*C.R.S. 37-60-126(4)
Requirement: Regulatory
activities designed to
encourage water efficiency
must be fully evaluated.*

Water providers should focus on ordinances and regulations that they can adopt and enforce either directly or through partnerships with their local government. They may be applied to the following areas of need:

- *Level 1: Existing Service Area* - This may apply to the whole service area (100% penetration rate) or specific categories of customers, such as single-family homes or commercial. The majority of regulations and ordinances in Colorado currently focus on this tier of customers.
- *Level 2: New Construction Regulations* – Communities experiencing large growth rates can significantly decrease future water demands by enforcing regulations and ordinances at Level 2. This level applies to ordinances and regulations that target new development. For example, landscape ordinances requiring proper soil amendments for all new residential and commercial construction is a relatively common ordinance implemented at Level 2. While these regulations are proactive in that they are addressing water efficiency at the construction phase, additional costs necessary to meet a regulation (e.g. extra costs for soil amendments) must be borne by either the seller/developer or purchaser of the newly constructed property. Depending on the scale and magnitude of additional costs involved, this could meet a certain level of opposition.
- *Level 3: Point of Sales Ordinances for Existing Building Stock* – Communities that experience relatively high rates of turnover can most significantly benefit from Level 3 ordinances. Regulations and ordinances enforced at a Level 3 require water efficient modifications to be made (e.g. replacement of certain fixtures and appliances with more water efficient fixtures and appliances) upon sale of the property. Similar to Level 2, Level 3 ordinances and regulations could meet opposition. For instance, the costs for new fixtures and appliances need to be incurred by some entity and this often ends up being the purchaser or seller of the home. In 2010, the Water Conservation Sub-Committee of the Inter Basin Compact Committee recommended investigating statewide real estate point of sale legislation in the coming years. This would address replacement of household fixtures such as toilets, dishwashers and clothes washers with efficient models. Education on the long-term cost saving benefits as a result of higher water efficient fixture and appliances may help reduce concerns for purchasers that have to bear the upfront costs.



Key Assessment Questions

The following key questions should be asked during the Ordinances and Regulations Phase 1 assessment. These questions can assist in focusing on target customers and appropriate level(s).³³

- Does the provider have a water waste ordinance? (This is recommended at minimum).
- What ordinances would be beneficial and reasonable from a water efficiency standpoint?
- Are there any broad political/social obstacles to, or positive pushes for, adoption of certain ordinances and regulations?
- What staff and financial resources are available for enforcement?
- What is the projected rate of new growth? Is there significant potential in water savings through regulation and ordinances on new development?

It is recommended that the screening and evaluation phases be conducted using [Worksheet F](#) and [Worksheet H](#), respectively. These worksheets may be filled out and included in an appendix for documentation.

Education Activities

Education activities (shown in Figure 27) are generally not as effective in changing customer behavior and reducing water usage when carried out as standalone programs. However, when coupled with other water efficiency activities they can greatly enhance the overall savings of a water efficiency program. Education activities primarily educate the public on the benefits of water efficiency, inform customers on how they can reduce their water usage, and publicize water efficiency activities the provider is implementing. Targeted advertisement campaigns can greatly enhance the effectiveness of water efficiency activities by informing and engaging the interest of the customer.

³³ As discussed in Section 4.4, answers to these key questions do not need to be documented. The main purpose of the assessment process is to characterize system-wide needs and traits prior to identifying water efficiency activities for screening and potential implementation.

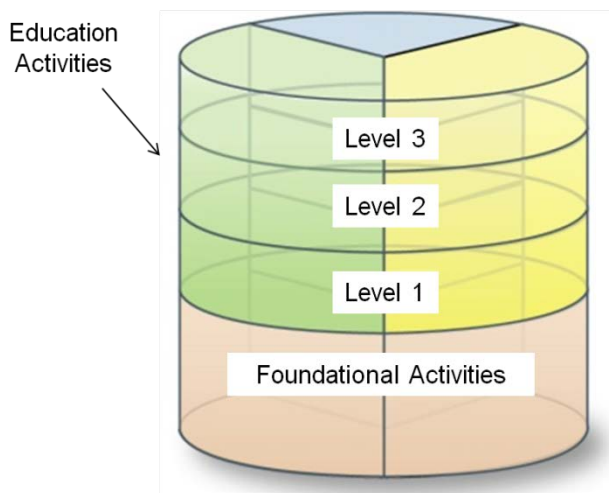


Figure 27 Education Activities

C.R.S. 37-60-126(4) requires the full evaluation of Educational Activities for implementation through the Phase 2 screening and/or Phase 3 evaluation processes. It is recommended that the selection of Education Activities be deferred until the majority of other activities have been selected. This enables the provider to select Education Activities that promote and convey compatible messages consistent with the selected activities. [Worksheet G](#) provides a comprehensive list of activities and Section 5.2 provides additional information on public participation in the plan implementation and monitoring stages.³⁴

*C.R.S. 37-60-126(4)
Requirement: Dissemination of information regarding water efficiency activities, including by public education, customer water use audits, and water-saving demonstrations must be fully evaluated.*

Education Activities may be organized by the following levels:

- **Level 1: One-Way Education** – Information is conveyed to the public without tracking or specific follow-up. This method of communication is the most common mode of communication among water providers in Colorado. It is used to convey water efficiency messages and can be very effective in advertising and informing the public on other water efficiency activities (e.g. rebate program). Popular forms include bill stuffers, email, untracked web sites, and xeriscape demonstration gardens.
- **Level 2: One-Way Education with Feedback** – Water providers convey information to the public and receive feedback on the effectiveness and applicability of its water efficiency activities. Tracking of public responses can also provide information on who is receiving and reacting to the information. This enables providers to adjust a message based on feedback. Examples of one-way education with feedback include water festivals, interactive websites, and customer surveys.

³⁴ If Education Activities are not selected for implementation, sufficient reasoning should be provided on why. Reason(s) may be provided directly in the report or in an appendix. [Worksheets G and H](#) can be used for this purpose.



- *Level 3: Two-Way Education* – Providers actively engage customers in developing and implementing the water efficiency plan. This can involve the development of stakeholder advisory boards or focus groups to address specific water efficiency issues. It can be an excellent medium for receiving comprehensive feedback from the customer perspective. Section 5.2 provides additional information on Level 3 Two-Way Education.

Key Assessment Questions

The following key questions should be asked during the Phase 1 assessment. These questions can assist in focusing on target customers and appropriate communication level(s).³⁵

- What level of financial and staff resources can the provider dedicate towards educational efforts?
- How can Education Activities be complementary to the other water efficiency efforts?
- What selected water efficiency activities would be greatly enhanced through advertising and appropriate targeted education?
- What types of media are most conducive for communicating with the public?
- What public members should be targeted?

It is recommended that the screening and evaluation phases be conducted using [Worksheet G](#) and [Worksheet H](#), respectively. These worksheets may be filled out and included in an appendix for documentation.

4.5 Step 5 – Implementation and Monitoring Plan

Step 5 involves the development of an implementation and monitoring plan. These two plans are necessary for effective water efficiency planning and are required by C.R.S. 37-60-126(4) for all State approved plans. The plans should lay out basic guidelines on how to effectively implement the activities selected in Step 4 and monitor their overall effectiveness. The plans should also acknowledge that water efficiency requires ongoing, adaptive management efforts where modifications may be necessary as the water efficiency activities are carried forward.

*C.R.S. 37-60-126(4)
Requirement: Steps
provider will use to
implement and monitor its
water efficiency plan.*

³⁵ As discussed in Section 4.4, answers to these key questions do not need to be documented. The main purpose of the assessment process is to characterize system-wide needs and traits prior to identifying water efficiency activities for screening and potential implementation.



4.5.1 Implementation Plan

An implementation plan defines the process necessary to carry out the selected water efficiency activities. [Worksheet J](#) may be used as a template for presenting the implementation plan. Plans should include the following components:

- *List of selected water efficiency activities* – These are the activities selected in Step 4.
- *Anticipated period of implementation* – This period may be for the entire planning horizon or for only a portion of the planning horizon.
- *Actions necessary to implement each activity and associated milestones* – List specific actions that are needed to start and/or administer the activity. For instance, a rebate program could require the following actions:
 - Obtain legislative approval.
 - Secure annual funding and verify number of rebates available for the year.
 - Train staff to administer program.
 - Advertise the rebate program through the website and through emails and bill inserts three times a year.
- *Entities/staff responsible for implementation* – This should be specified for each activity or appropriate groups of activities.
- *Coordination among staff/other entities and public involvement* – Note any coordination activities that must be carried out to ensure success of the activity. Public involvement includes educational campaigns, feedback, direct participation in certain actions, etc.
- *Annual water provider costs and avoided costs* – This may be provided for each SWSI Level Framework level or by individual activity.

Implementation plans may also address how each of the activities is going to be funded. While water efficiency activities are traditionally funded through a provider's annual revenue, certain funds/reserves may be set aside for specific activities and outside funding sources such as CWCB's water efficiency grants can be applied for.³⁶

Additionally, specific factors or contingencies that might affect or prevent the implementation of specific water efficiency activities should be noted. For example, if an activity cannot be implemented prior to obtaining a special permit, this fact should be noted along with an explanation of the strategy for obtaining the necessary permit. Some activities might require actions that take place over several years (in order to sustain water savings). The plan should provide sufficient detail to understand the provider's strategy with regard to implementing such activities.

³⁶ Implementation of the plan should not hinge on whether or not the provider can secure a water efficiency grant from the CWCB.



Revenue Implications

Implementation plans should not only budget for the costs to implement the activities, but also consider the effects water efficiency can have on revenue and future expenditures. Water efficiency can contribute to the reduction of a provider's variable costs such as energy, treatment chemicals, and purchased water costs. In the long term, water efficiency can result in significant savings in capital expenditures and water purchases. However, in the short term, reductions in water sales due to water efficiency can lead to a shortfall in revenues needed to cover operational and capital costs, if not properly planned for. Both long term and short term perspectives should be weighed in relation to the overall water resource management planning of the water provider so as to mitigate the possible negative effects.

Potential shortfalls in revenues need to be prepared for and properly managed in order to reduce or completely avoid detrimental impacts. Implementation plans should describe how water efficiency activities can affect water utility revenues and expenditures. Collaboration between water conservation specialists and their own finance group is critical to planning for these revenue impacts. Strategies should be planned to avoid such adverse impacts to ensure the provider meets its revenue requirements. This could include temporary or permanent increases in water rates, which could in turn impact customers and may not be politically popular. In these cases, it is critical to develop a well thought out public education campaign to prepare the public and clearly explain the reasons for the change.

4.5.2 Monitoring Plan

The science of water efficiency and water resources planning is continually evolving and water saving technology and evaluation/modeling techniques continue to improve. Water efficiency planning is most effective when it is managed as an adaptive continuous process where routine monitoring and adjustments are made to the implementation plan and activities. This could include adjustments to the water efficiency goals and overall direction of the water efficiency program. Due to these factors, the data presented in water efficiency plans may be outdated before the plan is scheduled for update.

This instance emphasizes the importance of establishing a routine monitoring program that assesses the effectiveness of the water efficiency activities within the context of changing conditions. Monitoring provides the necessary information for decision-makers to make the appropriate adjustments to a water efficiency program.

A monitoring plan defines the process to carry out the monitoring and make appropriate adaptive changes to the implementation of the water efficiency activities. Monitoring plans should include the following components: 1) data collection; 2) the evaluation and communication processes; and 3) documentation. These are discussed in further detail below.

Data collection – This consists of demand data as well as other relevant data specific to implementation. [Worksheet K](#) provides a list of demand data which may be selected for monitoring water savings through the demand management activities. Ideally these data should be of a scale to capture changes in demand as a result of water efficiency activities. However, some providers may find that they will need to make improvements to their billing systems



and/or invest additional staff time to collect sufficient data which could be difficult due to funding limitations. Demand data specifically required per C.R.S. 37-60-126 (4.5) for annual reporting to the State is specified in [Worksheet K](#). It is recommended that at a minimum, these data are incorporated into monitoring plans.

[Worksheet L](#) provides a template to record demand data selected for monitoring as well as a means to specify other relevant data specific to the implementation of the water efficiency activities. At a minimum, monitoring data for each water efficiency activity should include:

- Annual costs and avoided costs.
- Lessons learned.
- Water saving estimates.
- Water efficiency activity tracking data (e.g. number of annual rebates, number of infractions, etc).
- Relevant weather data.
- Relevant public feedback.
- Records of significant changes.

In addition to these data, the entity/staff responsible for data collection and frequency of data collection should be specified. Monitoring data should be collected on a frequent enough basis to ensure that data is properly recorded.

Evaluation and communication to decision-makers – An evaluation of the collected data is necessary to determine the overall effectiveness of each water efficiency activity. This evaluation can significantly vary in level of sophistication depending on available staff time and financial resources. Section 4.2.3 discusses how the water savings of water efficiency activities may be evaluated. These techniques involve the estimation of water savings using time-series of customer demand data. Water savings information may be coupled with other data collection and analyses efforts (e.g. customer opinion surveys and cost-benefit analyses) to evaluate the effectiveness of water efficiency activities.

The evaluation results and any recommended changes necessary to improve the effectiveness of the water efficiency program should be presented to decision-makers. These evaluation and communication processes should be summarized in the monitoring plan including the frequency of when they will occur. It is recommended that this occurs at least every two years.

Documentation of monitoring results and of adaptive adjustments – The lessons learned and changes made to the implemented water efficiency activities should be well documented following the evaluation and decision making processes. Documentation can enhance the quality of the future updated water efficiency plans as well as provide continuity among staff and the public.



Worksheets M and N may be used by the provider for monitoring. Worksheet M provides a template to record monthly water demands on an annual basis. Worksheet N provides a means to record information on the other monitoring data.

4.6 Adoption of New Policy, Public Review and Formal Approval

Specific components of this section are required per C.R.S. 37-60-126 (5) for State approved plans. This section provides information on the adoption of relevant new policy, the public review process, formal approval, and future plan updates.

4.6.1 Adoption of New Policy

Implementation of the water efficiency plan could require the development of new policy. For example, water wasting ordinances and enforcement policies may be necessary. As the plan is being developed, it is important to develop policy necessary for implementation and have the policy approved through official processes.

4.6.2 Public Review Process

A public review process is required for all State approved plans per C.R.S. 37-60-126 (5). This process improves the quality of the water efficiency plan, reduces potential future conflicts, and also helps ensure that the plan reflects the values of the community. Providers should follow the appropriate rules, codes, or ordinances of their community to make the draft plan available for public review and comment. If there are no rules, codes, or ordinances governing the provider's public planning process, then each provider shall publish a draft plan, give public notice of the plan, make such plan publicly available, and solicit comments from the public for a period of no less than sixty days after the date on which the draft plan is made publicly available.

C.R.S. 37-60-126(5) Requirement: A public review and comment process must take place. If provider does not have rules, codes, or ordinances to make a draft plan available for a public planning process, then the covered entity shall publish a draft plan, give public notice of the plan, make such plan publicly available, and solicit comments from the public for a period of not less than 60 days after the date on which the draft plan is made publicly available.

Prior to final approval of the plan, the public should have the opportunity to review and comment on the plan. Draft plans can be presented on the provider's website, emailed, and available in hard copy at the provider's office or other local locations such as public libraries. Public meetings can also be scheduled to address public feedback.

4.6.3 Local Adoption and State Approval Processes

C.R.S. 37-60-126 (2) requires that water efficiency plans be formally adopted by the local governing entity. Consequently, decision makers (e.g. city council/board members) should have an opportunity to review and comment on the plan before it is finalized.



The plan itself should document the approval or formal adoption/approval of the plan. This includes the name of the government body that officially adopted the plan, date of adoption, and a copy of the adoption document in an appendix. Any challenges encountered during the adoption process may also be documented.

The plan development and local adoption process should be conducted in conjunction with the State approval process. Providers are encouraged to use the following sequential steps:

- Develop draft plan using the Model Template in Section 6.0.
- Submit draft plan to the CWCB for a cursory overview. CWCB will provide comments on any significant issues/potential changes for discussion.
- Address comments and conduct public review process.
- Incorporate public and local governing entity comments for review.
- Present and/or submit plan to governing body for formal adoption.
- Submit final adopted plan to the CWCB for formal approval.

It may be beneficial for specific members or for the whole governing body to review and comment on the plan prior to the review(s) by CWCB and/or the public review. How this process “fits in” with the sequential process outlined above is at the discretion of the provider. Providers may contact CWCB at any time during the development and approval/adoption processes with questions and technical assistance.

4.6.4 Periodic Review and Update

As discussed previously, water efficiency planning is most effective when viewed as an ongoing process rather than the discrete development of a plan. C.R.S. 37-60-126 (4) requires that all plans include the steps necessary to review and revise plans. This should include the following items:

- Department/staff responsible for taking the lead in initiating the plan update and collecting appropriate data.
- Process of how monitoring results will be incorporated into updated plans.

*C.R.S. 37-60-126 (4)
Requirement: Steps provider
will use to review and revise
its water efficiency plan*

*C.R.S. 37-60-126 (4)
Requirement: Time period, not
to exceed seven years, after
which provider will review
and update its adopted plan.*

Additionally, per C.R.S. 37-60-126 (4), the anticipated date of the next update, not to exceed seven years, must be included in the Plan.



4.6.5 Local Water Efficiency Plans and Informational Resources

The information necessary to develop water efficiency plans may be obtained and integrated from other water resource planning documents developed by the provider. This may include past water efficiency plans, drought management plans, capital improvement plans, raw water master plans, treated water master plans, etc. These references should be clearly cited in water efficiency plans.



5.0 PUBLIC STAKEHOLDER INVOLVEMENT

Water efficiency and water resource planning processes that are open and transparent can significantly improve the quality and community support of a plan. This is especially applicable to water efficiency planning, where the success of a plan is highly dependent on the public's participation in conserving water.

In Colorado, the development of water efficiency plans is generally conducted by provider staff and/or a supporting contractor. Unfortunately, public reviews can be a reactive process in the sense that the majority of the plan has been developed before the public has the opportunity to comment. Stakeholder processes that proactively incorporate feedback from the public during plan development can improve the quality and overall effectiveness of plans. Additionally, public engagement during the implementation and monitoring processes can significantly increase public awareness and effectiveness of water efficiency activities.

5.1 Plan Development with Public and Stakeholder Participation

There are many benefits associated with incorporating a public stakeholder process during development of a local water efficiency plan. A stakeholder process serves the dual function of providing a feedback mechanism between the provider staff and the public while also serving as a means to educate members of the public on the value of water efficiency. Stakeholder processes can also be used as a vehicle to generate public support for plans and ensure that the plans are representative of community values.

Members of a stakeholder committee should include key staff involved with day-to-day municipal and/or water supply operations in addition to members of the public. This may include the following:

- City or General Manager
- Water treatment and water quality manager(s)
- Water resources manager
- Conservation specialist
- City finance/accounting specialist
- Billing administrator
- Representative of the planning department
- Legal staff
- Communications director
- Residential water consumers



- Commercial, institutional and industrial water consumers
- Environmental and non-profit groups
- Representatives of minorities
- Representatives of other government agencies or departments within the municipality
- Recreational water users
- Representatives of local agriculture
- Educational institutions.

Figure 28 presents how information may be exchanged between the developer(s) of the plan and the public or stakeholder committee during the five-step water efficiency planning process. Elements that require a more informed background (e.g. decisions on certain water efficiency activities) may be more appropriate for the stakeholder committee whereas, inquiries on values, for example the aesthetics of xeriscaping vs turf grass, may be more conducive for the general public.

As shown by the hashed arrows in Figure 28, there are many opportunities for the public and a stakeholder committee to participate in the development of a plan in addition to the formal public review process that occurs near plan completion. As discussed in Section 4.0, Steps 1 and 2 primarily consist of background information obtained from other water resource planning efforts. This information, in addition to the modified demands from Step 3, may be conveyed to the stakeholder committee to inform them on how water efficiency efforts can affect municipal demands and, ultimately, future water supply planning. This, in turn, enables the stakeholder committee to develop well-informed opinions and decisions during key aspects of the plan development. The public and stakeholder committee can provide valuable feedback into the development of water efficiency benefits and goals. This can help ensure that the plan and overall direction of the water efficiency program is compatible with the community's values. Step 4 could be a collaborative process where stakeholder input may be instrumental in developing some of the qualitative screening criteria and factors to consider during the evaluation phase. Public participation could also be a key component of the plan implementation and monitoring discussed in Section 5.2. Feedback on the public's role in implementation and monitoring could be obtained during the Step 5 of the plan development.

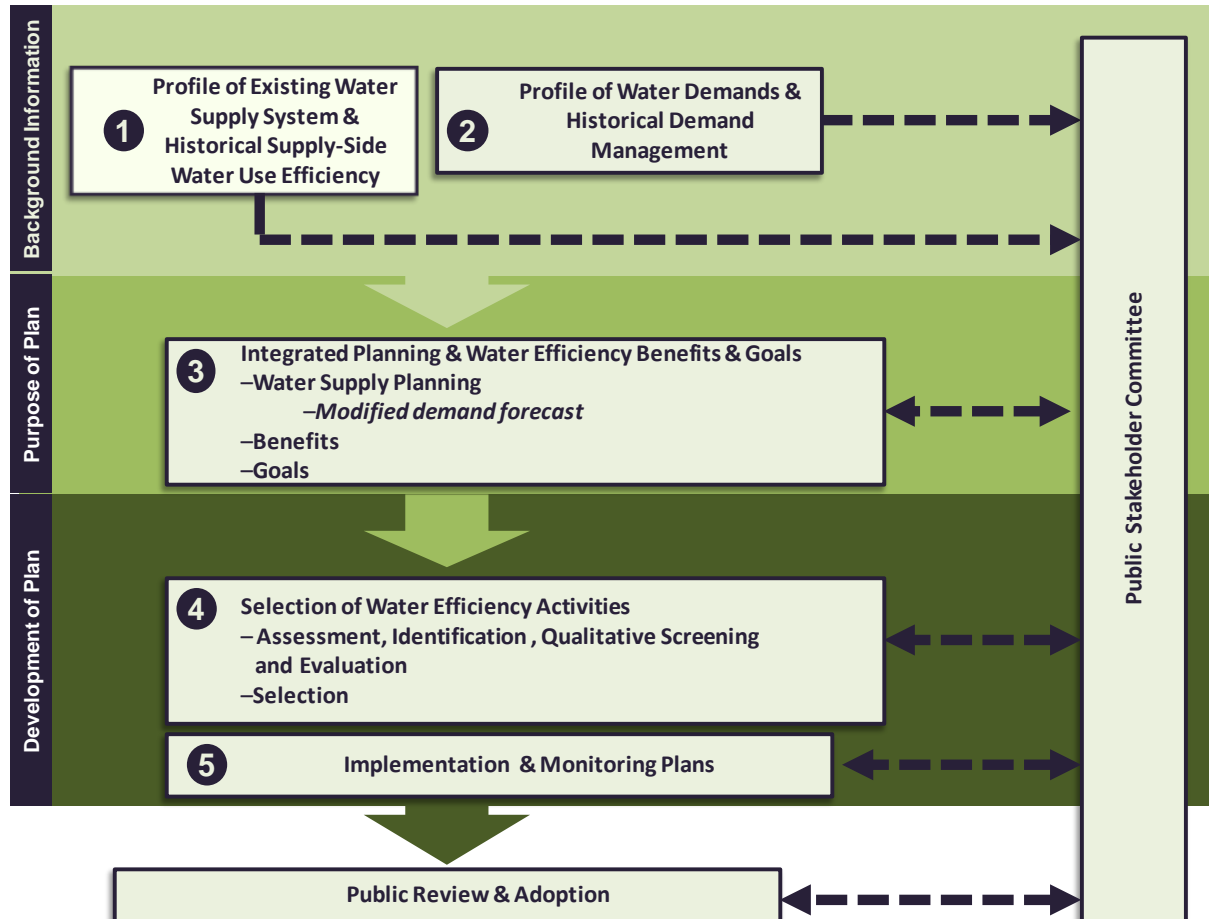


Figure 28 Public and Stakeholder Involvement during the Five-Step Water Efficiency Planning Process

Public opinion surveys or questionnaires on the community's values and perceptions can also be extremely valuable for plan development.³⁷ Examples of particularly useful information include the following:

- *Reasons for why the public conserves or does not conserve water* – A reason for conserving could be “it is the right thing to do,” while others may not conserve because they believe the saved water simply goes to supporting new growth. This information can be useful in developing public campaigns promoting wise water use.
- *Perception of xeriscaping vs turf grass* – Surveys that provide the public the opportunity to rank various landscaping images comprised of both turf grass and xeriscaping. This can be used as a tool to gauge the public's general preference for xeriscape or turf grass.
- *Level of satisfaction with the service area landscaping aesthetics* – Should there be more trees, more grass, more xeriscaping, etc?

³⁷ It is important to note that the opinion surveys and questionnaires are an optional tool to obtain additional information on customers' values and perceptions related to water use and landscape. It is not a requirement.



- *How does the public feel about the provider's effort to be water efficient?* – Can the provider save more water through their daily operations?
- *Can the public make more of an effort to conserve water?* – This could include both indoor and outdoor activities and apply to the customer at a personal level as well as their view of the public in general.
- *Designated areas on City-owned parks and open spaces where it would be publicly accepted to change from turf grass to xeriscape* – This can be useful for future landscaping plans.
- *Ability and desire to convert landscaping from lawns to xeriscape* – Would customers be willing to install xeriscaping? If so, how much would they be willing to pay to do so? Would monetary incentives be useful and if so, how much?

5.2 Public Participation with Implementation and Monitoring

Including members of the public, and possibly water oriented stakeholder groups, during the implementation and monitoring effort can increase the overall success of the plan. Ongoing involvement can help maintain and build support for achieving the water efficiency goals and can assist in “getting the word out” about the water efficiency effort. Additionally, public participation in monitoring provides system managers with valuable information on implementation challenges and success factors. This feedback can inform the provider of improvements necessary to increase the effectiveness of the water efficiency program.

Examples of activities the provider can implement to promote such participation include the following:

- Hold regular meetings with community members to keep them informed of the municipality's progress in meeting the water efficiency goals.
- Provide a forum (e.g. survey, workshops, blog, etc) for participants to supply input on the level of satisfaction or dissatisfaction with the municipality's water efficiency activities.
- Recruit volunteers (e.g. students and retirees) to assist with monitoring water efficiency efforts such as conducting public surveys on certain water efficiency activities. This can be a cost savings for the provider who does not have to invest in staff time for such services.
- Develop K-12 programs and provide materials and training to teachers on the importance of water efficiency and what the provider is doing to promote water efficiency.
- Use social networking (e.g. Facebook) to get community members engaged.
- Recruit volunteers to solicit signatures in support of water efficiency. This would provide volunteers the opportunity to inform the public of the water provider's water efficiency activities.



- Publicly acknowledge businesses that are meeting a high level of water efficiency. They can use this recognition to promote their business.

Many of the items listed above qualify as Level 3 Two-Way Education activities and can be selected during Step 4 as Education Activities. These activities should be developed and provided during Step 4 of the plan development. Providers that have an extensive list of Education Activities should consider developing a separate public outreach plan that provides the necessary guidance on how each of the activities is to be coordinated and carried out. This public outreach plan may be included as an appendix to the local plan.



6.0 ORGANIZATION AND CONTENT – TEMPLATE FOR A WATER EFFICIENCY PLAN

This section provides recommendations on the organization and content of municipal water efficiency plans according to the five steps introduced in Section 4.0. A Model Template is provided in Section 6.3 to assist providers in formatting and developing their own individual plans.

6.1 Organizational Tips for Water Efficiency Plans

The following items address how plans may be organized to best meet the needs of the public, decision makers, and water management staff. Please note that these items are merely tips that providers may incorporate into their planning process and are not requirements.

- *Executive summary* – Executive summaries provide an effective means to convey the basic information excluding the technical details that only the water management staff may be concerned with. These summaries can be directed towards the public, media, and decision-makers. At a minimum, it is recommended that an executive summary include: water efficiency goals, selected water efficiency activities, and a summary of the implementation and monitoring plans. Condensed fact sheets may also be useful in conveying the highlights of the plan to the public and decision makers.
- *Appendices* – Appendices are another means to separate detailed technical information from the main body of the document. For example, new policy developed for the implementation of the plan may be put into an appendix.

6.2 How to Use the Model Template

The Model Template provides a framework that providers may use to develop water efficiency plans. The Model Template is organized according to the five-step planning process introduced in Section 4.0 where, with exception of the introduction and final section, each of the main sections corresponds with each of the five planning steps. Each of the subsections includes a checklist of required and recommended content. Providers may use these checklists as a means to ensure that they are including all pertinent information in their plans. It is worth noting that some of the checklist information will not be applicable to certain municipalities while others may not have the resources to develop a detailed plan that includes all of the information. Providers may use the check boxes next to each informational item as a means to check off which items they plan to include.

The left-hand column of the template addresses the level of importance and purpose of each checklist item using the following designations:

- **Required** – Required for State approval pursuant to C.R.S. 37-60-126 (1-4 and 5). Note that many of the data reporting requirements under C.R.S. 37-60-126 (4.5) (HB 10-1051), which are annual reporting requirements for covered entities, are also designated as required, though they might not apply to non-covered entities who do not seek grant or loans from the



CWCB. The required section defines what elements and processes are necessary for effective water efficiency planning and for an approved State water conservation plan. See Section 3.1 for additional details.

- Beneficial – Recommended because it provides added value to a plan. This includes some of the data required by the State according to C.R.S. 37-60-126 (4.5) (HB 10-1051).
- Public – Provides added value to a provider’s water efficiency efforts and/or enhance the overall readability and usability of the document for public educational purposes. This includes data required by the State according to C.R.S. 37-60-126 (4.5) (HB 10-1051).
- Documentation – Provides information that can be built on for other studies/future water efficiency plan updates and can increase the overall usability of the document.

The Model Template should be used in conjunction with the detailed water efficiency planning information in Section 4.0 and the worksheets provided in Appendix A. Where appropriate, the specific worksheets are noted in the Model Template. While not required, these worksheets provide a useful resource for generating ideas, organizing information, and for formatting data for direct incorporation into the plan. Also, sections designated as “*Template Section*” refer to sections of the template whereas sections simply designated as “*Guidance Document Section*” refer to a specific section of the Guidance Document.

6.3 Water Efficiency Plan Model Template

The Model Template is provided on the following page.



	Required
Δ	Beneficial
Δ	Public
\square	Document

Introduction

This section introduces the general approach used to develop the water efficiency plan and describes the entities involved with the Plan development.

- Approach to the development of the plan. These are the five steps outlined in Guidance Document Section 4.0; 1) profile of existing water supply system, 2) profile of water demands and historical demand management, 3) integrated planning and water efficiency benefits and goals, 4) selection of water efficiency activities, and 5) implementation and monitoring plan.
- Provide general context/overview of plan.
- Overview of the provider's historical conservation/water efficiency plans. This may include a brief history on the conservation/water efficiency plan(s) to date and when the plan(s) were developed.
- Entities involved with development of the plan (e.g. public works, planning department, parks department, water board, public stakeholder group, etc).
- Describe the stakeholder process or alternative outreach efforts discussed in Guidance Document Section 5.0, and incorporated into the development of the plan.
- General description of how the conservation plan is compatible and coordinated with other local plans (e.g. integrated water resources plans, raw and treated water master plans, drought plans, county hazard mitigation plans, etc).
- List of resources used to develop the water efficiency plan. This may be included in an appendix or separate references section.

1.0 Profile of Existing Water Supply System

This section provides an overview of the provider's existing water supply system, supply reliability, system limitations and challenges and historical supply-side water efficiency efforts.

1.1 Overview of Existing Water Supply System

Objective: Provide a description of the existing water supply system and service area.

- ☐ Geographic area served and/or map of service area.
- ☐ Raw non-potable water, treated water and reclaimed water supply sources.



Required	Beneficial	Public	Document
	Δ	□	<input type="checkbox"/> Key existing facilities. This may include descriptions of the following: <ul style="list-style-type: none"> – Reservoirs – general location, acre-feet of storage. – Groundwater wells – general location of well(s), source aquifers. – Water treatment plant(s) – general location, capacity, type of treatment. – Wastewater treatment plants(s) – general location, capacity, type of treatment. – Water distribution system – miles of pipeline, number of pressure zones.
✓			<h3>1.2 Water Supply Reliability</h3> <p>Objective: Provide an overview of the existing water supply reliability.</p> <input type="checkbox"/> Provider's location with respect to areas of current and future water needs as identified by the Statewide Water Supply Initiative (SWSI) and other regional planning efforts.
	Δ	□	<p>Summary of water supply system reliability. Consideration may be given to each of the following:</p> <input type="checkbox"/> – Overview of how the provider determines reliability (water supply modeling).
	Δ	□	<input type="checkbox"/> – Firm yield (if applicable).
	Δ	□	<input type="checkbox"/> – Reliability or drought criteria (if applicable).
	Δ	□	<input type="checkbox"/> – Safety factors.
	Δ	□	<input type="checkbox"/> – Whether climate change is included in the planning and if so, how?
	Δ		<input type="checkbox"/> If the provider has excess supplies after meeting its municipal demands (this may occur in normal and/or wet years), describe how this water is used (e.g. agricultural leases, drought reserves, instream flows, etc).
✓			<h3>1.3 Supply-Side Limitations and Future Needs</h3> <p>Objective: Identify water supply system limitations, future needs and planned actions to address these limitations and needs. This information will be useful in determining how water efficiency efforts could further address some of these limitations and future needs in Step 3.</p> <input type="checkbox"/> Summary of water supply system limitations and future challenges water managers have for planning and operating their systems. Worksheet A provides a template that may be used to furnish this information.



Required	Beneficial	Public	Document
✓			<input type="checkbox"/> Description of how the provider intends to address its water supply system limitations and future challenges. This may include a description of specific facility enhancements, water acquisition, water efficiency efforts, necessary to meet the limitations/needs described above. Worksheet A provides a template that may be used to furnish this information.
			<h2>2.0 Profile of Water Demands and Historical Demand Management</h2> <p>This section provides an overview of the historical water demand trends as well as the influence of historical water demand management on water use and forecasted future water demands. This is a data intensive section where graphs and charts are encouraged in addition to discussion summarizing the data and observed trends. Specific examples of graphs are provided in Guidance Document Section 4.2.2. Note: This information may be provided directly in the plan or referenced from other planning documents. All referenced documents must be included in an appendix and the reference must include the chapter and page number.</p> <h3>2.1 Demographics and Key Characteristics of the Service Area</h3> <p>Objective: Provide information on descriptions of customer categories, on service area population and other information such as demographics and housing stock age.</p> <p> <input type="checkbox"/> Description of customer categories (e.g. single-family, multi-family, commercial, municipal, irrigation). These categories are often defined in the provider's billing system. </p> <p> <input type="checkbox"/> Service area population. </p> <p> <input type="checkbox"/> Other pertinent information (e.g. demographics, age of housing stock, etc). See Guidance Document Section 4.2.1 for details. </p> <h3>2.2 Historical Water Demands</h3> <p>Objective: Provide an overview on historical water demand data.</p> <p>It is recommended that, at a minimum, demand data include the past five years. Demand data may be presented in graphical or tabular format. Examples of each of the demand data types listed below are provided in Guidance Document Section 4.2.2. In addition to the data itself, an appropriate level of discussion including observed trends, patterns and significant findings should be included. Information specific to the demand data in relation to historical demand management activities may be reserved for Template Section 2.3.</p> <p> <input type="checkbox"/> Describe any limitations associated with the availability of the demand data. Examples of challenges are discussed in Guidance Document Section 4.2.2. </p>
✓			



Required	Beneficial	Public	Document
✓			Consideration should be given to the following total system-wide demand data:
✓			<input type="checkbox"/> – Total annual distributed treated water; C.R.S. 37-60-126 (4.5).
✓			<input type="checkbox"/> – Total annual raw distributed non-potable water and reclaimed water; C.R.S. 37-60-126 (4.5).
✓			<input type="checkbox"/> – Annual non-revenue water; C.R.S. 37-60-126 (4.5).
✓			Water demand by customer categories:
✓			<input type="checkbox"/> – Monthly and Annual treated metered water use by customer category; C.R.S. 37-60-126 (4.5).
	Δ		<input type="checkbox"/> – Monthly and Annual raw water/reclaimed metered water use by customer category; C.R.S. 37-60-126 (4.5).
	Δ		<input type="checkbox"/> Largest water user groups and any observed water use trends. Include whether these water user(s) are implementing water efficiency activities and if reductions in water usage can be observed over time. Large water user groups may include: <ul style="list-style-type: none"> – Industrial/commercial users (e.g. breweries, factories). – Residential homes (e.g. number of homes in the highest tier of residential water use). – University campuses. – Other large users.
			Some additional ways to analyze system wide demand are:
	Δ		<input type="checkbox"/> – Per capita water demands and description of calculation.
	Δ		<input type="checkbox"/> – Indoor and outdoor water usage and description of calculation.
	Δ		<input type="checkbox"/> – Peak day demands.



Required	Beneficial	Public	Document
✓			<p>2.3 Past and Current Demand Management Activities and Impact to Demands</p> <p>Objective: Summarize past and current demand management activities, goals and projected savings. Discuss how demand management activities and other factors have impacted historical water use.</p> <p><input type="checkbox"/> According to C.R.S. 37-60-126 (4), all State approved plans must include an estimate of the amount of water saved through previous demand management efforts as a percentage or in acre-foot increments. These data can be drawn from various literature resources and/or by assessing historical demand trends. See Guidance Document Section 4.2.3 for additional information. These estimates should represent annual savings of each individual activity for at least the past five years or at a minimum, the savings of each relevant SWSI Levels Framework category level introduced in Guidance Document Section 4.4.1 (e.g. Ordinances and Regulations). Worksheet B provides a format to record water savings by individual activity.</p> <p><input type="checkbox"/> List of demand management activities implemented prior to adoption of this plan and the date of initial implementation. Worksheet B provides a template based on the SWSI Level Framework; C.R.S. 37-60-126 (4.5).</p> <p><input type="checkbox"/> Projected water savings/goals developed from previous efforts. Discuss whether these projected water savings were achieved.</p> <p><input type="checkbox"/> Summary and results of analysis to identify how demand management activities impacted historical demands. This could include:</p> <ul style="list-style-type: none"> – Significant efforts that influenced demands and when they were initiated (e.g. implementation of a water efficiency plan, metering and/or metering upgrades, changes to water rates and/or the billing rate structure). – Other factors that affected water demands. These may include drought, water restrictions, economic conditions or rainfall. <p><input type="checkbox"/> Discussion of passive vs. active demand management savings and quantitative data that supports passive demand reductions. See Guidance Document Section 4.2.3 for information on how to estimate passive water efficiency savings.</p> <p><input type="checkbox"/> Lessons learned on the implementation, monitoring and overall effectiveness of the historical demand management activities.</p>
✓	Δ		
✓			
	Δ		
		□ +	
✓			<p>2.4 Demand Forecasts</p> <p>Objective: Provide demand forecasts assuming no modifications to the currently implemented demand management activities.</p> <p><input type="checkbox"/> Identify planning horizon for this plan. Guidance Document Section 4.2.4 discusses reasonable planning horizons.</p>



Required	Beneficial	Public	Document
✓			<input type="checkbox"/> Unmodified forecasted water demands based on the provider's existing water efficiency program (without the new water efficiency activities selected in Step 4) through the planning horizon. This is often presented in bar or line charts. See Guidance Document Section 4.2.4 for more information.
	Δ	+	<input type="checkbox"/> Summary of method(s) and any assumptions used to develop the demand forecast.
<h3>3.0 Integrated Planning and Water Efficiency Benefits and Goals</h3> <p>This section focuses on the role that water efficiency plays in the water provider's water supply planning efforts. Information is presented on the provider's water supply planning efforts, future capital improvements, the anticipated benefits of the water efficiency plan and water efficiency goals.</p> <h4>3.1 Water Efficiency and Water Supply Planning</h4> <p>Objective: Summarize water supply system challenges/limitations and introduce current water supply planning efforts such as future water acquisitions and capital improvements. Describe how water acquisitions and/or capital improvement modifications could be made as a result of demand reductions through enhanced water efficiency activities.</p> <p>It is recognized that water right and infrastructure information can be sensitive and, consequently, it may not be appropriate for some providers to include details in their plans. In these cases, the challenges and limitations may be addressed in general terms to preserve confidentiality. Regardless of how this information is included, it is highly recommended that the provider go through the process of identifying system limitations and challenges in order to determine how water efficiency could be a beneficial component to future planning efforts in Step 3.</p>			
✓			<input type="checkbox"/> According to C.R.S. 37-60-126 (4), a description of how long-term water savings garnered through water efficiency activities are incorporated into water supply planning and decision making.
✓			<input type="checkbox"/> Modified forecasted water demands through the planning horizon incorporating the provider's projected water savings identified in Template Section 4.0. (This item will need to be completed following Step 4). These data may be presented in bar or line charts.
	Δ	□	<input type="checkbox"/> If appropriate and logical, discussion of how water savings achieved through the new water efficiency plan could or could not result in the elimination, downsizing and/or postponement of certain capital improvements/water acquisitions. Worksheet C provides a template for presenting this information.



Required	Beneficial	Public	Document
	Δ		<input type="checkbox"/> – Estimated costs of the facility needs and water right acquisitions, dates of when construction/acquisition is anticipated and dates of when financing is anticipated. Worksheet C provides a template for presenting this information.
	Δ		<input type="checkbox"/> – Provide estimates of cost savings for the capital/water acquisition modifications discussed above. Worksheet C provides a template for presenting this information.
	Δ		<input type="checkbox"/> – Comparison of costs to implement the water efficiency activities selected in Step 4 to the estimated costs savings associated with the changes made to future capital improvements/water acquisitions.
	Δ	□	<input type="checkbox"/> State how the saved water will be used (e.g. drought reserves, instream flows and/or new demands).
	Δ	□	<input type="checkbox"/> List additional water efficiency benefits. Guidance Document Section 4.3.2 provides examples of water efficiency benefits.
✓			3.2 Water Efficiency Goals Objective: Develop a set of qualitative and quantitative water efficiency goals that are appropriate for the provider's water supply system and designed to achieve the water efficiency benefits illustrated in Template Section 3.1. These goals will be used in the screening and evaluation processes outlined in Step 4 and development of the goals can be an iterative process between Steps 3 and 4.
			<input type="checkbox"/> List of water efficiency goals for this plan and methods by which the success of the goals will be measured. Guidance Document Section 4.3.3 provides useful examples and information on how these goals may be developed. These goals should incorporate the following: <ul style="list-style-type: none"> – Targeted total water savings. – Targeted water savings by customer class. – Targeted water savings from system water loss control management.
	Δ	+	<input type="checkbox"/> Explanation of how these goals were developed and designed to achieve the water efficiency benefits in Template Section 3.1.
	Δ	+	<input type="checkbox"/> Explanation of how these goals compare to the goals in the provider's former water efficiency plan and describe why goals remained the same or were changed.



Required	Beneficial	Public	Document
✓			
✓		□ +	
	△		

4.0 Selection of Water Efficiency Activities

This section presents the water efficiency activities selected for implementation and describes the processes used to identify, screen, and evaluate each of these activities. As discussed in Guidance Document Section 4.4, the water efficiency activities are organized into the SWSI Levels Framework to assist providers in prioritizing individual activities.

4.1 Summary of Selection Process

The following subsections include the elements/activities required to be fully considered and evaluated for implementation per C.R.S. 37-60-126 (4). However, after fully evaluating all of the required elements/activities, a provider may determine that a specific element/activity is not feasible for their service area or water system. **If a provider does not implement a C.R.S. 37-60-126 (4) required element/activity, documentation and supporting materials shall be provided in either the main body of the plan or in an appendix demonstrating that the element/activity was fully considered and evaluated during the selection and/or evaluation process, and the justification for why it will not be implemented.**

- ☐ List of final selected water efficiency activities included in the new water efficiency plan.
- ☐ Summary of the identification, screening and evaluation processes used to select the final activities and that demonstrate full evaluation. These processes are described in Guidance Document Section 4.4.
- ☐ These worksheets provided in the guidance document may be included in an appendix:
 - [Worksheets D, E, F and G](#) may be used as a tool to identify and screen the demand-side SWSI levels of activities.
 - [Worksheet H](#) may be used to evaluate the supply and demand-side water efficiency activities carried forward into the evaluation process.

4.2 Demand Management Activities

Objective: Present the demand management activities selected for implementation. This section focuses on the screening and evaluation results; not the process. Documentation on the screening and evaluation process for each water efficiency activity should be included in tabular format in an appendix. [Worksheets D, E, F, G and H](#) may be used to develop these tables. See Guidance Document Section 4.4 for additional information on the screening and evaluation process.



Required	Beneficial	Public	Document
✓			<input type="checkbox"/> According to C.R.S. 37-60-126(4), the plan shall include either as a percentage or in acre-feet increments, an estimate of the amount of water that will be saved through water efficiency when the plan is implemented. These estimates should represent, at a minimum, the annual projected savings of each relevant SWSI Levels Framework category introduced in Guidance Document Section 4.4.1 or the annual projected savings of each individual activity. ³⁸ Worksheet I provides a template that may be used to present this information for both the historical and new water efficiency activities.
✓			4.2.1 Foundational Activities
✓			<input type="checkbox"/> Estimated water savings. This may also be provided in a summary table listing the savings of all activities selected for implementation. See Statute requirement in Guidance Document Section 4.2.3.
✓			Metering
✓		□ +	<input type="checkbox"/> Description of current and planned metering programs. Examples of metering programs include: meter replacement/upgrade; meter testing; and submetering programs. This includes a description of activities performed in the past, relevant costs, estimated water savings, lessons learned, and any other information used during the selection and evaluation processes that could be beneficial for future implementation.
✓			<input type="checkbox"/> Modifications and/or new metering programs selected as a result of this water efficiency planning effort. This should include anticipated implementation costs, estimated water savings and any additional information beneficial to refer to during implementation.
	Δ		<input type="checkbox"/> Number of metered and unmetered accounts for treated water customers and non-potable water customers. Include type of meter (e.g. manual read, AMR, AMR with telemetry). See Guidance Document Appendix C for the HB 10-1051 Guidelines; C.R.S. 37-60-126 (4.5).
		□ +	<input type="checkbox"/> Discussion on any significant unmetered uses and lessons learned from past metering programs.
✓			Demand Data Collection and Billing Systems
✓			<input type="checkbox"/> According to C.R.S. 37-60-126 (4), billing systems designed to encourage water efficiency in a fiscally responsible manner shall be fully evaluated. This may include improvements/upgrades to the existing billing system to improve data collection. (See Worksheets D and H).

³⁸ These total savings should be used to develop the modified demands presented in Template Section 3.1.



Required	Beneficial	Public	Document	
				Billing systems often dictate the type of demand data available for monitoring purposes. Describe the billing system and available demand data. Consideration should be given to:
✓		+	<input type="checkbox"/>	– Description of demand data available through the billing system. This may include water usage by customer category (residential, commercial, etc).
✓		+	<input type="checkbox"/>	– Frequency of billing.
✓			<input type="checkbox"/>	Describe modifications to the data collection and billing systems as a result of this water efficiency planning effort.
		+	<input type="checkbox"/>	Discussion of any past lesson(s) learned.
Water Efficiency Oriented Rates and Tap Fees				
✓			<input type="checkbox"/>	According to C.R.S. 37-60-126 (4), water rate structures designed to encourage water efficiency in a fiscally responsible manner shall be fully evaluated. This may be included in the main body of the report or in an appendix.
✓		+	<input type="checkbox"/>	Detailed description of the proposed or existing water rate structure and frequency of billing (e.g. inclining block rate structure on a monthly basis). (See Worksheets D and H); C.R.S. 37-60-126 (4.5).
✓			<input type="checkbox"/>	Description of proposed adjustments to water rate structure and/or rates. This may include changes to the water rate structure, frequency of billing and/or a qualitative discussion on anticipated rate increases. Specific rate adjustments may also be provided.
✓			<input type="checkbox"/>	Existing water rate structures by customer category (e.g. \$3.21 per 1,000 gallons for Tier 1 residential customers); C.R.S. 37-60-126 (4.5)
		+	<input type="checkbox"/>	Description of any past lesson(s) learned.
System Water Loss Management and Control				
✓			<input type="checkbox"/>	According to C.R.S. 37-60-126 (4), distribution system leak identification and repair designed to encourage water efficiency in a fiscally responsible manner shall be fully evaluated. (See Worksheets D and H).
✓		+	<input type="checkbox"/>	Description of current and planned system water loss management and control programs. Examples of system water loss management and control programs include: system-wide water audits; investigation of apparent losses; leak detection and repair programs; and water line replacement programs. This description may also include implementation costs and water savings.
		+	<input type="checkbox"/>	Description of any past lesson(s) learned and any other information used during the selection and evaluation processes that could be beneficial for future implementation.



Required	Beneficial	Public	Document
			4.2.2 Targeted Technical Assistance and Incentives <p>Objective: Detail the Targeted Technical Assistance and Incentive activities selected for implementation. Targeted Technical Assistance and Incentives cover various actions providers and customers can do to improve water efficiency. This can include the installation of water efficient fixtures and appliances, low water use landscapes, water efficient commercial and industrial water using processes, water efficiency incentives and re-use systems. This template organizes the content of this section according to the SWSI Levels Framework.</p> <p><input type="checkbox"/> According to C.R.S. 37-60-126 (4), water-efficient fixtures and appliances (including toilets, urinals, clothes washers, showerheads, and faucet aerators); incentives to implement water efficiency techniques (including rebates to customers to encourage the installation of water efficiency activities); low water use landscapes, drought resistant vegetation, and efficient irrigation; and water-efficient industrial & commercial water-using processes; and re-use systems shall be fully evaluated. (See Worksheets E and H).</p> <p><input type="checkbox"/> Estimated water savings. This may also be provided in a summary table listing the savings of all activities selected for implementation. See Statute requirement in Guidance Document Section 4.2.3.</p> <p>Level 1 Utility/Municipal Facility Water Efficiency</p> <p>Description of the water efficiency activities that the water provider has selected for implementation and has direct control over. Include the following information for each activity:</p> <p><input type="checkbox"/> Description of the implementation plan for each activity within the targeted customer category.</p> <ul style="list-style-type: none"> For example, number of audits to be performed at water provider facilities, number of high efficiency fixtures to be installed at recreation centers, number of irrigation zones to be audited at parks along with actions to be performed as a result of the audits. <p><input type="checkbox"/> Potential implementation costs.</p> <p><input type="checkbox"/> Benefits of each activity including social, economic and institutional benefits.</p> <p><input type="checkbox"/> If implemented prior to this plan, provide past performance indicators and any lessons learned from past implementation.</p> <p>Level 2 Management of Largest Customer Demands</p> <p>Description of the selected water efficiency activities focused on the largest water users. Include the following information for each activity:</p>
✓			
✓			
✓			
	Δ		
	Δ		
		□ +	



Required	Beneficial	Public	Document
✓			<input type="checkbox"/> Description of the implementation plan for each activity within the targeted customer category. <ul style="list-style-type: none"> For example, description of the method for identifying largest users, number of largest users who will be reached during the activity, nature of water use addressed by the activity (outdoor, indoor, peak). <input type="checkbox"/> Potential implementation costs. <input type="checkbox"/> Benefits of each activity including social, economic and institutional benefits. <input type="checkbox"/> If implemented prior to this plan, provide past performance indicators and any lessons learned from past implementation.
	Δ		
	Δ		
		□ +	
✓			Level 3 Management of Remaining Customer Demands <p>Description of the selected water efficiency activities that focus on the remainder of the service area and/or on specific customer categories (e.g. toilet rebates for residential homes). Include the following information for each activity:</p> <input type="checkbox"/> Description of the implementation plan for each activity within the targeted customer category. <ul style="list-style-type: none"> For example, description of the method for prioritizing customer categories for inclusion, estimated number of customers who will be reached during the activity, nature of water use and customer category addressed by the activity (e.g. toilet rebates for residential homes). <input type="checkbox"/> Potential implementation costs. <input type="checkbox"/> Benefits of each activity including social, economic and institutional benefits. <input type="checkbox"/> If implemented prior to this plan, provide past performance indicators and any lessons learned from past implementation.
	Δ		
	Δ		
		□ +	
✓			4.2.3 Ordinances and Regulations <p>Objective: Detail the regulatory activities selected for implementation. Ordinances and Regulations consist of locally adopted policies that encourage water efficiency. Common ordinances and regulations include water wasting policies and water restrictions. This template organizes the content of this section according to the SWSI Levels Framework.</p> <input type="checkbox"/> According to the C.R.S. 37-60-126 (4), regulatory activities designed to encourage water efficiency shall be fully evaluated. (See Worksheets F and H). Estimated water savings. This may also be provided in a summary table listing the savings of all activities selected for implementation. See Statute requirement in Guidance Document Section 4.2.3.
✓			



Required	Beneficial	Public	Document
			<p>Level 1 Existing Service Area</p> <p>Description of the regulation(s) selected to target the general service area and/or specific customer categories (e.g. residential). The following information should be included for each regulation:</p> <p><input type="checkbox"/> Description of the implementation plan for the regulation(s) selected and targeted customer categories. This may include:</p> <ul style="list-style-type: none"> – Agency/entity that the provider must work with to enforce the regulation. – Level of enforcement that is anticipated. – What does the regulation focus on? – Who will the regulation affect? <p><input type="checkbox"/> Anticipated costs for administration and enforcement.</p> <p><input type="checkbox"/> Benefits of each activity including social, economic and institutional benefits</p> <p><input type="checkbox"/> Any challenges encountered to adopt the regulation.</p> <p><input type="checkbox"/> If the regulation(s) were enacted in the past, provide information and any lessons learned.</p> <p>Level 2 New Construction Regulations</p> <p>Description of the regulation(s) selected for new construction. The following information should be included for each regulation:</p> <p><input type="checkbox"/> Description of the implementation plan for the regulation(s) selected and associated targeted customer categories.</p> <ul style="list-style-type: none"> – Agency/entity that the provider must work with to enforce the regulation. – Level of enforcement that is anticipated. – What does the regulation focus on (irrigation systems, landscape, soil amendment)? – Who will the regulation affect? <p><input type="checkbox"/> Anticipated costs for administration and enforcement.</p> <p><input type="checkbox"/> Benefits of each activity including social, economic and institutional benefits.</p> <p><input type="checkbox"/> Any challenges encountered to adopt the regulation.</p> <p><input type="checkbox"/> If the regulation(s) were enacted in the past, provide information and any lessons learned.</p> <p>Level 3 Point of Sales Ordinances on Existing Building Stock</p> <p>Description of the regulation(s) selected for existing building stock (e.g. point of sales ordinance). The following information should be included for each regulation:</p>
✓			
	Δ		
	Δ		
	Δ	+	
		□ +	
✓			
	Δ		
	Δ		
	Δ	+	
		□ +	



Required	Beneficial	Public	Document
✓			<input type="checkbox"/> Description of the implementation plan for the regulation(s) selected and associated targeted customer categories: <ul style="list-style-type: none"> – Agency/entity that the provider must work with to enforce the regulation. – Level of enforcement that is anticipated. – What types of water efficient fixtures and level of efficiency are required? – Who will the regulation affect?
	△		<input type="checkbox"/> Anticipated costs for administration and enforcement.
	△		<input type="checkbox"/> Benefits of each activity including social, economic and institutional benefits.
	△	+	<input type="checkbox"/> Any challenges encountered to adopt the regulation.
		□ +	<input type="checkbox"/> If the regulation(s) were enacted in the past, provide information and any lessons learned.
4.2.4 Education Activities			
Objective: Detail the education and outreach programs selected for implementation. Education activities primarily educate the public on the benefits of water efficiency, inform customers on how they can reduce water usage, and publicize water efficiency activities the provider is implementing. This template organizes the content of this section according to the SWSI Levels Framework.			
✓			<input type="checkbox"/> According to C.R.S 37-60-126 (4), dissemination of information regarding water efficiency activities (including by public education, customer water use audits, and water-saving demonstrations) shall be fully evaluated. (See Worksheets G and H).
✓			<input type="checkbox"/> Estimated water savings. This may also be provided in a summary table listing the savings of all activities selected for implementation. See Statute requirement in Guidance Document Section 4.2.3.
Level 1 One-Way Education Activities			
Description of the selected Education Activities. The following information should be included for each activity:			
✓			<input type="checkbox"/> Description of the implementation plan for each activity within the targeted customer category.
	△		<input type="checkbox"/> Potential implementation costs.
		□ +	<input type="checkbox"/> Benefits of each activity and targeted customer(s).
	△		<input type="checkbox"/> If the activity was implemented in the past, provide information and any lessons learned from past implementation.



Required	Beneficial	Public	Document
✓	Δ	□ +	<p>Level 2 One-Way Education with Feedback</p> <p>Description of the selected Education Activities. The following information should be included for each activity:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Description of the implementation plan for each activity within the targeted customer category. <input type="checkbox"/> Potential implementation costs. <input type="checkbox"/> Benefits of each activity and targeted customer(s). <input type="checkbox"/> If the activity was implemented in the past, provide information and any lessons learned from past implementation. <p>Level 3 Two-Way Education</p> <p>Description of the selected Education Activities. The following information should be included for each activity:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Description of the implementation plan for each activity within the targeted customer category. <input type="checkbox"/> Potential implementation costs. <input type="checkbox"/> Benefits of each activity and targeted customer(s). <input type="checkbox"/> If the activity was implemented in the past, provide information and any lessons learned from past implementation. <p>5.0 Implementation and Monitoring Plan</p> <p>This section addresses the activities and coordination necessary to implement the water efficiency plan and monitor the overall effectiveness of the water efficiency plan.</p> <p>5.1 Implementation Plan</p> <p>Objective: Discuss the actions, timeline and coordination necessary to implement the selected water efficiency activities.</p> <ul style="list-style-type: none"> <input type="checkbox"/> C.R.S. 37-60-126(4) requires an implementation plan for all State approved plans. This includes a description and details of the steps the provider will use for implementing each of the water efficiency activities. Worksheet J provides a template that may be used to present the implementation plan. <p>The following components of an implementation plan should be considered:</p> <ul style="list-style-type: none"> <input type="checkbox"/> – List of selected water efficiency activities.
✓	Δ	□ +	
✓	Δ	□ +	



Required	Beneficial	Public	Document
✓			<input type="checkbox"/> – Anticipated period of implementation and timeline.
✓			<input type="checkbox"/> – Actions necessary to implement each activity and milestone goals.
✓			<input type="checkbox"/> – Estimated water provider costs and avoided costs - Detail per SWSI Level Framework or by individual activity.
	△		<input type="checkbox"/> – Entities/staff responsible for implementation.
	△		<input type="checkbox"/> – Necessary coordination among staff/other entities and public involvement.
	△		<input type="checkbox"/> – List of funding sources.
✓		<input type="checkbox"/>	<input type="checkbox"/> Discussion on how reductions in water use could impact revenue and actions taken to help mitigate negative impacts. See Guidance Document Section 4.5.1 for more details.
5.2 Monitoring Plan			
Objective: Describe the data collection and assessment activities necessary to monitor the effectiveness of the water efficiency plan. See Guidance Document Section 4.5.2 for additional information.			
✓			<input type="checkbox"/> C.R.S. 37-60-126 (4) requires the steps used to monitor the water efficiency plan be included in all State approved plans.
Monitoring plans should include the following components:			
✓			<input type="checkbox"/> List of demand data to be collected during the monitoring period/ process. Worksheet K provides a list of demand data which may be selected for monitoring water savings garnered through the demand management activities. Demand data may include:
– Total water use tracking such as total treated water distributed, system per capita water use, total indoor/outdoor water use, and/or system peak day water use.			
– Water use by customer category such as treated metered water use, per capita water use and/or indoor/outdoor metered use.			
– Demand data specifically required per C.R.S. 37-60-126 (4.5) for annual reporting to the state is specified in Worksheet K . It is recommended that at a minimum, these data are incorporated into monitoring plans.			



Required	Beneficial	Public	Document
✓			<input type="checkbox"/> List of other relevant data specific to the implementation of the activities. Worksheet L provides a template to record the demand data selected for implementation as well as a means to specify other data specific to the implementation of the water efficiency activities. At a minimum, monitoring data for each water efficiency activity should include: <ul style="list-style-type: none"> – Annual costs and avoided costs. – Lessons learned. – Water saving estimates. – Water efficiency activity tracking data (e.g. number of annual rebates, number of infractions, etc). – Weather data. – Public feedback. – Records of significant changes in water efficiency programming or other variables affecting water consumption.
✓			<input type="checkbox"/> Summary of the process to communicate monitoring and evaluation results to decision-makers, including the frequency of communication. It is recommended that this occurs at least every two years.
✓			<input type="checkbox"/> Frequency of data collection should be specified. Worksheets K and L provides a means to record this.
	Δ		<input type="checkbox"/> Entity/staff responsible for data collection should be specified. Worksheets K and L provides a means to record this.
	Δ		<input type="checkbox"/> Worksheets M and N may be used by the provider for monitoring. Worksheet M provides a template to record monthly water demands on an annual basis and Worksheet N provides a means to record information on the other monitoring data.



amec | 87



Required	Beneficial	Public	Document
✓			
✓			
		□ +	
✓			

6.4 Periodic Review and Update

Objective: Summarize the processes that will occur to facilitate the update of the Plan and the anticipated timing of Plan updates.

- ☐ Steps used to review and revise the water efficiency plan. C.R.S. 37-60-126 (4) requires that all plans include the steps necessary to review and revise plans.
- ☐ Process of how monitoring results will be incorporated into updated plans.
- ☐ Department/staff responsible for taking the lead in initiating the Plan update and collecting appropriate data.
- ☐ Anticipated date of next water efficiency plan update. Per C.R.S. 37-60-126 (4), the anticipated date of the next update, not to exceed seven years, must be included in the Plan.



7.0 REFERENCES

AMEC Earth and Environmental. 2010. *Municipal Drought Management Plan Guidance Document*. Prepared for: Colorado Water Conservation Board.

American Water Works Association. 2006. *Water Conservation Programs – A Planning Manual. Manual of Water Supply Practices M52. First Edition*.

Aquacraft, Inc. 2009. *Utility Water Loss. A Review of Current Practices in Colorado, Requirement in Other States, and New Procedures and Tools*. Submitted to: Colorado Water Conservation Board.

Aquacraft, Inc. 2010. *Colorado Water Wise Guidebook of Best Practices for Municipal Water Conservation in Colorado*.

Billings, R. B and Jones, C.V. 2008. *Forecasting Urban Water Demand*. American Water Works Association.

Colorado Legislation. House Bill 04-1365.

Colorado Legislation. House Bill 10-1051.

Colorado Legislation. House Bill 91-1154.

Environmental Protection Agency. 1998. *Water Conservation Plan Guidelines*.

Flory, J.E., and T. Panella, 1994. *Long-term water conservation and shortage management practices: Planning that includes demand hardening*. Prepared for California Urban Water Agencies.

Great Western Institute. 2005. *Water Conservation Plan Development Guidance Document*. Prepared for: Office of Water Conservation and Drought Planning Colorado Water Conservation Board.

Great Western Institute. 2010. *SWSI Conservation Levels Analysis Final Report*. Prepared for: Colorado Water Conservation Board.

Great Western Institute. 2011. *Draft Expanded SWSI Conservation Levels Analysis Draft Report*. Prepared for Colorado Water Conservation Board.

Mayor, Peter and Little, David. 2006. *System Reliability and Demand Hardening Memo*. Prepared for: SWSI Conservation & Efficiency TRT M&I Question 1 Sub-group.

Appendix A Guidance Document Worksheets

This appendix provides a series of worksheets in support of the development of water efficiency plans. This worksheet collection is essentially a toolkit intended to assist providers with generating ideas, organizing information, and formatting data for direct incorporation into the plan. If appropriate, portions of the worksheet tables or tables in their entirety can be inserted directly into the water efficiency plan or appendices. All of the items in the worksheets and worksheets themselves may not be applicable to every provider and should be used at the provider's own discretion. Each worksheet includes a set of instructions in blue font. The following worksheets are provided:

- Worksheet A – Water Supply Limitations and Future Needs
- Worksheet B – Historical and Current Water Efficiency Activities
- Worksheet C – Modifications to Capital Improvement Projects and Water Acquisitions
- Worksheet D – Identification and Screening of Foundational Activities
- Worksheet E – Identification and Screening of Targeted Technical Assistance and Incentives
- Worksheet F – Identification and Screening of Ordinances and Regulations
- Worksheet G – Identification and Screening of Education Activities
- Worksheet H – Evaluation and Selection of Water Efficiency Activities
- Worksheet I – Selected Water Efficiency Activities and Estimated Water Savings
- Worksheet J – Implementation Plan
- Worksheet K – Selection of Monitoring Demand Data for Monitoring Plan
- Worksheet L – Monitoring Plan
- Worksheet M – Annual Demand Tracking Sheet
- Worksheet N – Annual Monitoring Tracking Sheet

WORKSHEET A - WATER SUPPLY LIMITATIONS AND FUTURE NEEDS

Limitation and/or Future Need [1]	[2]		Comments on Limitation or Future Need [3]	How is Limitation or Future Need Being Addressed [4]
	Yes	No		
System is in a designated critical water supply shortage area				
System experiences frequent water supply shortages and/or emergencies				
System has substantial non-revenue water				
Experiencing high rates of population and demand growth				
Planning substantial improvements or additions				
Increases to wastewater system capacity anticipated				
Need additional drought reserves				
Drinking water quality issues				
Aging infrastructure in need of repair				
Issues with water pressure in portions of distribution system				
<i>Add additional supply limitations and/or future needs</i>				

Instructions:

[1] This column provides a list of limitations/future needs related to planning and operating the water supply system.

[2] Enter an "X" to show whether or not the system exhibits the limitations/future needs.

[3] Include any comments regarding the limitations/future needs that may be useful to consider in the planning process.

[4] If applicable, include how the limitation/future need is being addressed.

WORKSHEET B - HISTORICAL AND CURRENT WATER EFFICIENCY ACTIVITIES

Historical and Current Water Efficiency Activities [1]	Period of Implementation [2]	Annual Water Savings for Past Five Years (AF or %) [3]					Total Five-Year Water Savings [4]	Average Annual Savings [5]
		Enter Year (e.g. 2007)	Enter Year (e.g. 2008)	Enter Year (e.g. 2009)	Enter Year (e.g. 2010)	Enter Year (e.g. 2011)		
Foundational Activities								
List Foundational Activities								
List Foundational Activities								
List Foundational Activities								
Subtotal								
Targeted Technical Assistance and Incentives								
List Targeted Technical Assistance and Incentives								
List Targeted Technical Assistance and Incentives								
List Targeted Technical Assistance and Incentives								
Subtotal								
Ordinances and Regulations								
List Ordinances and Regulations								
List Ordinances and Regulations								
List Ordinances and Regulations								
Subtotal								
Education Activities								
List Education Activities								
List Education Activities								
List Education Activities								
Subtotal								
Total Savings								

Instructions:

- [1] List the current/historical water efficiency activities previously implement according to the SWSI Levels Framework.
- [2] Enter the dates/years the activities have been/were implemented.
- [3] Enter annual estimated savings for each activity. If water savings are not measureable enter n/a.
- [4] Include total water savings since the activities have been implemented.
- [5] Include average annual savings.

WORKSHEET C - MODIFICATIONS TO CAPITAL IMPROVEMENT PROJECTS AND WATER ACQUISITIONS

Capital Improvement Projects and Water Acquisitions [1]	Estimated Cost [2]	Action as a Result of Reduced Demands				Potential Cost Savings [5]
		[3]				
		Eliminated	Postponed	Downsized		
Comments [4]						

Instructions:

[1] List capital improvement projects and water acquisitions being implemented or considered.

[2] Include estimated cost for the projects/water acquisitions.

[3] Specify with an "X" whether the project/water acquisition may be eliminated, postponed, or downsized as a result of water efficiency improvements.

[4] Provide additional comments (e.g. extent of postponement and/or anticipated downsizing).

[5] Include potential cost savings as a result of the elimination, postponement and/or downsizing.

WORKSHEET D - IDENTIFICATION AND SCREENING OF FOUNDATIONAL ACTIVITIES

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification		Qualitative Screening [5]					Carry to Evaluation [6]	Reason for Elimination [7]
		Existing/ Potential Activity [3]	Targeted Customer Category [4]	Enter screening criteria	Enter screening criteria	Enter screening criteria	Add additional screening criteria	Notes on Additional Pros/Cons to Consider		
Metering (BP1)	V, VII									
Automatic Meter Reading Installation and Operations										
Submetering for Large Users (Indoor and Outdoor)										
Meter Testing and Replacement										
Meter Upgrades										
Identify Unmetered/Unbilled Treated Water Uses										
<i>Add additional activities</i>										
Data Collection - Monitoring and Verification (BP2)										
Frequency of Meter Reading										
Tracking Water Use by Customer Type										
Upgrade Billing System to Track Use by Sufficient Customer Types										
Tracking Water Use for Large Customers										
Area of Irrigated Lands in Service Area (e.g. acres)										
<i>Add additional activities</i>										
Water Use Efficiency Oriented Rates and Tap Fees (BP1)	VII, VIII									
Volumetric Billing										
Water Rate Adjustments										
Frequency of Billing										
Inclining/Tiered Rates										
Water Budgets										
Tap Fees with Water Use Efficiency Incentives										
<i>Add additional activities</i>										
System Water Loss Management and Control (BP3)	V									
System Wide Water Audits										
Control of Apparent Losses (with Metering)										
Leak Detection and Repair										
Water Line Replacement Program										
<i>Add additional activities</i>										
Planning (BP2)										
Integrated Water Resources Plans										
Master Plans/Water Supply Plans										
Capital Improvement Plans										
Feasibility Studies										
<i>Add additional activities</i>										
Staff (BP4)										
Water Conservation Coordinator										
<i>Add additional activities</i>										

Instructions:

[1] This column provides a list of possible activities & identifies the Best Practice activity as defined in the Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado. List additional activities identified through the planning process.

[2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.

[3] Specify whether the activity is "Existing" or a "Potential" activity to carry through screening by entering an "E" or "P", respectively.

[4] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.

[5] Enter screening criteria based on qualitative goals developed in Step 3 and insert an "X" for activities that meet the listed screening criteria.

[6] Based on the screening process, indicate which activities will be carried onto the evaluation phase with an "X".

[7] If eliminated via screening, comment on why.

WORKSHEET E - IDENTIFICATION AND SCREENING OF TARGETED TECHNICAL ASSISTANCE INCENTIVES

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Existing/ Potential Activity [3]	Identification				Qualitative Screening [6]					Carry to Evaluation [7]	Reason for Elimination [8]		
			SWSI Framework Levels [4]			Targeted Customer Category [5]	Enter screening criteria	Enter screening criteria	Enter screening criteria	Add additional screening criteria	Notes on Additional Pros/Cons to Consider				
			Level 1 Municipal Uses	Level 2 Customers with the Largest Water Use	Level 3 Customer Type(s) in Service Area										
Installation of Water Efficient Fixtures and Appliances														I	
Indoor Audits															
Toilet Retrofits															
Urinal Retrofits															
Showerhead Retrofits															
Faucet Retrofits (e.g. aerator installation)															
Water Efficient Washing Machines															
Water Efficient Dishwashers															
Efficient Swamp Cooler and Air Conditioning Use															
Add additional activities															
Low Water Use Landscapes														II	
Drought Resistant Vegetation															
Removal of Phreatophytes															
Irrigation Efficiency Evaluations/Outdoor Water Audits															
Outdoor Irrigation Controllers															
Irrigation Scheduling/Timing															
Rain Sensors															
Residential Outdoor Meter Installations															
Xeriscape															
Other Low Water Use Landscapes															
Irrigation Equipment Retrofits															
Add additional activities															
Water- Efficient Industrial and Commercial Water-Using Processes														III	
Specialized Nonresidential Surveys, Audits and Equipment Efficiency Improvements															
Commercial Indoor Fixture and Appliance Rebates/Retrofits															
Cooling Equipment Efficiency															
Restaurant equipment															
Add additional activities															
Incentives														X	
Toilet Rebates															
Urinal Rebates															
Showerhead Rebates															
Water Efficient Faucet or Aerator Rebates															
Water Efficient Washing Machine Rebates															
Water Efficient Dishwasher Rebates															
Efficient Irrigation Equipment Rebates															
Landscape Water Budgets Information and Customer Feedback															
Turf Replacement Programs/Xeriscape Incentives															
Give-aways															
Add additional activities															

Instructions:

- [1] This column provides a list of activities & if applicable, identifies the Best Practice activity as defined under *Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado*. List additional activities identified through the planning process.
- [2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.
- [3] Specify whether the activity is an "Existing" or "Potential" activity to carry through screening by entering an "E" or "P", respectively.
- [4] Specify which level the historical/potential activities fall under by entering an "X" in the appropriate column.
- [5] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
- [6] Enter screening criteria based on qualitative goals developed in Step 3 and insert an "X" for activities that meet the listed screening criteria.
- [7] Based on the screening process, indicate which activities will be carried on the evaluation phase with an "X".
- [8] If eliminated via screening, comment on why.

WORKSHEET F - IDENTIFICATION AND SCREENING OF ORDINANCES AND REGULATIONS

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification					Qualitative Screening [6]					Carry to Evaluation [7]	Reason for Elimination [8]
		Existing/ Potential Activity [3]	SWSI Framework Levels [4]			Targeted Customer Category [5]	Enter screening criteria	Enter screening criteria	Enter screening criteria	Add additional screening criteria	Notes on Additional Pros/Cons to Consider		
			Level 1 Customer Type(s) within the Existing Service Area	Level 2 New Development	Level 3 Point of Sales on Existing Building Stock								
General Water Use Regulations	IX												
Water Waste Ordinance (BP 5)													
Time of Day Watering Restriction													
Day of Week Watering Restriction													
Water Overspray Limitations													
Add additional activities													
Landscape Design/Installation Rules and Regulations	IX												
Rules and Regulations for Landscape Design/Installation (BP 9)													
Landscape Training and Certification (BP 8)													
Irrigation System Installer Training and Certification (BP 8)													
Soil Amendment Requirements (BP 9)													
Turf Restrictions (BP 9)													
Irrigation Equipment Requirements													
Outdoor Water Audits/Irrigation Efficiency Regulations (BP 10)													
Outdoor Green Building Construction (BP 8,9)													
Add additional activities													
Indoor and Commercial Regulations	IX												
High Efficiency Fixture and Appliance Replacement (BP 12)													
Commercial Cooling and Process Water Requirements (BP 14)													
Green Building Construction (BP 12)													
Indoor Plumbing Requirements (BP 12)													
City Facility Requirements (BP 12)													
Required Indoor Residential Audits (BP 13)													
Required Indoor Commercial Audits (BP 14)													
Commercial Water Wise Use Regulations (Car Washes, Restaurants, etc.)													
Add additional activities													

Instructions:

[1] This column provides a list of possible activities & if applicable identifies the Best Practice activity as defined under Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado. List additional activities identified through the planning process.

[2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.

[3] Specify whether the activity is an "Existing" or "Potential" activity to carry through screening by entering an "E" or "P", respectively.

[4] For current/historical activities, specify which level the activities fall under by entering an "X" in the appropriate column.

[5] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.

[6] Enter screening criteria based on qualitative goals developed in Step 3 and insert an "X" for activities that meet the listed screening criteria.

[7] Based on the screening process, indicate which activities will be carried on the evaluation phase with an "X".

[8] If eliminated via screening, comment on why.

WORKSHEET G - IDENTIFICATION AND SCREENING OF EDUCATION ACTIVITIES

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Existing/ Potential Activity [3]	Identification			Targeted Customer Category [5]	Qualitative Screening [6]					Carry to Evaluation [7]	Reason for Elimination [8]
			SWSI Framework Levels [4]				Enter screening criteria	Enter screening criteria	Enter screening criteria	Add additional screening criteria	Notes on Additional Pros/Cons to Consider		
			Level 1 One-Way	Level 2 One-Way with Feedback	Level 3 Two-way communication								
Customer Education (BP6)	VI												
Bill Stuffers													
Newsletter													
Newspaper Articles													
Mass Mailings													
Web Pages													
Water Fairs													
K-12 Teacher and Classroom Education Programs													
Message Development/Campaign													
Interactive Websites													
Social Networking (e.g. Facebook)													
Customer Surveys													
Focus Groups													
Citizen Advisory Boards													
Add additional activities													
Technical Assistance	VI												
Customer Water Use Workshops													
Landscape Design and Maintenance Workshops													
Xeriscape Demonstration Garden													
Water Conservation Expert Available													
Add additional activities													

Instructions:

- [1] This column provides a list of possible activities & if applicable identifies the Best Practice activity as defined under Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado. List additional activities identified through the planning process.
- [2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.
- [3] Specify whether the activity is an "Existing" or "Potential" activity to carry through screening by entering an "E" or "P", respectively.
- [4] For current/historical activities, specify which level the activities fall under by entering an "X" in the appropriate column.
- [5] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
- [6] Enter screening criteria based on qualitative goals developed in Step 3 and insert an "X" for activities that meet the listed screening criteria.
- [7] Based on the screening process, indicate which activities will be carried on the evaluation phase with an "X".
- [8] If eliminated via screening, comment on why.

WORKSHEET H - EVALUATION AND SELECTION OF WATER EFFICIENCY ACTIVITIES

Water Efficiency Activities for Evaluation [1]	Existing/ Potential Activity [2]	Targeted Customer Category [3]	Review of Qualitative Screening				Evaluation							Final Selection [8]	
			Qualitative Goals [4]				Projected Water Savings [5]		Projected Implementation Costs [6]	Quantitative Goals [7]					
			Enter screening criteria	Enter screening criteria	Enter screening criteria	Add additional screening criteria	Total Water Savings	Average Annual Water Savings		Enter evaluation factors	Enter evaluation factors	Add additional screening criteria	Notes on Additional Pros/Cons to Consider	Selected for Implemen- tation	If Eliminated, Reason Why Eliminated
Foundational Activities															
List Foundational Activities selected post screening															
List Foundational Activities selected post screening															
List Foundational Activities selected post screening															
Targeted Technical Assistance and Incentives															
List Targeted Technical Assistance and Incentives selected post screening															
List Targeted Technical Assistance and Incentives selected post screening															
List Targeted Technical Assistance and Incentives selected post screening															
Ordinances and Regulations															
List Ordinances and Regulations selected post screening															
List Ordinances and Regulations selected post screening															
List Ordinances and Regulations selected post screening															
Education Activities															
List Education Activities selected post screening															
List Education Activities selected post screening															
List Education Activities selected post screening															

Instructions:

- [1] List of water efficiency activities that were carried to the evaluation process (based upon Worksheets D through G).
- [2] Specify whether the activity is "Existing" or "Potential" activity by entering an "E" or "P", respectively.
- [3] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
- [4] Enter the screening results from Worksheets D through G by entering the screening criteria and appropriate "X" designations.
- [5] As applicable, enter the estimated water savings to implement the activities within the planning horizon and the average annual water savings. Enter N/A if the water savings can not be estimated with reasonable accuracy.
- [6] As applicable, enter the estimated annual costs.
- [7] Enter evaluation criteria based on quantitative goals developed in Step 3 and insert an "X" for activities that meet the listed criteria.
- [8] Enter an "X" for activities selected for implementation and provide an explanation if an activity was not selected for implementation.

WORKSHEET I - SELECTED WATER EFFICIENCY ACTIVITIES AND ESTIMATED WATER SAVINGS

Selected Water Efficiency Activities [1]	Implementation Period of Historical Activities [2]	Historical Total Water Savings [3]	Implementation Period of New Activities [4]	Projected Water Savings for Planning Period [5]
Foundational Activities				
<i>List selected Foundational Activities</i>				
<i>List selected Foundational Activities</i>				
<i>List selected Foundational Activities</i>				
Targeted Technical Assistance and Incentives				
<i>List selected Technical Assistance and Incentives Activities</i>				
<i>List selected Technical Assistance and Incentives Activities</i>				
<i>List selected Technical Assistance and Incentives Activities</i>				
Ordinances and Regulations				
<i>List selected Ordinances and Regulations</i>				
<i>List selected Ordinances and Regulations</i>				
<i>List selected Ordinances and Regulations</i>				
Education Activities				
<i>List selected Education Activities</i>				
<i>List selected Education Activities</i>				
<i>List selected Education Activities</i>				

Instructions:

- [1] Provide the list of water efficiency activities selected for implementation based on Worksheet H.
- [2] Include the period of time when historical activities were implemented. For potential activities, include "N/A".
- [3] Provide total water savings for historical activities (average annual or total cumulative savings). For potential activities, include "N/A".
- [4] Indicate when new activities will be implemented. For existing activities, include "N/A".
- [5] Specify potential future water savings for both historical/current and new activities (average annual or total cumulative savings).

WORKSHEET J - IMPLEMENTATION PLAN

Selected Water Efficiency Activities [1]	Period of Implementation [2]	Implementation Actions [3]	Milestone Deadlines [4]	Annual Budget (\$1,000) [5]	Entity/Staff Responsible for Implementation [6]	Coordination and Public Involvement [7]	Additional Comments [8]
Foundational Activities							
List selected Foundational Activities							
List selected Foundational Activities							
List selected Foundational Activities							
Targeted Technical Assistance and Incentives							
List selected Technical Assistance and Incentives Activities							
List selected Technical Assistance and Incentives Activities							
List selected Technical Assistance and Incentives Activities							
Ordinances and Regulations							
List selected Ordinances and Regulations							
List selected Ordinances and Regulations							
List selected Ordinances and Regulations							
Education Activities							
List selected Education Activities							
List selected Education Activities							
List selected Education Activities							

Instructions:

[1] Provide the list of water efficiency activities selected for implementation during Step 4.

[2] Provide period in which activity is going to be implemented.

[3] Include information on specific actions necessary to implement the activities (e.g. advertise rebates to public).

[4] Indicate timing of when the action are scheduled to be implemented (e.g. when leaks will be repaired, when rebate program will start, etc.).

[5] Insert anticipated annual costs.

[6] Specify which entity/staff responsible for implementing the activities.

[7] If applicable, comment on necessary coordination among staff/other entities and how the public will be involved. This includes educational campaigns, feedback, direct participation in certain actions, etc.

[8] Add any additional comments.

WORKSHEET K - SELECTION OF MONITORING DEMAND DATA FOR MONITORING PLAN

Monitoring Data [1]	HB 10-1051 Reporting Requirement [2]				Selection [3]				Entity/Staff Responsible for Data Collection and Evaluation [4]	Schedule/Timing of Monitoring [5]	Comments [6]
	Annual	Monthly	Bi-Monthly	Daily	Annual	Monthly	Bi-Monthly	Daily			
Total Water Use											
Total treated water produced (metered at WTP discharge)											
Total treated water delivered (sum of customer meters)	√										
Raw non-potable deliveries											
Reclaimed water produced (metered at WWTP discharge)											
Reclaimed water delivered (sum of customer meters)											
Per capita water use											e.g. method of calculation
Indoor and outdoor treated water deliveries											e.g. estimation method
Treated water peak day produced											
Reclaimed water peak day produced											
Raw water peak day produced/delivered											
Non-revenue water	√										
<i>Insert other demand data</i>											
Water Use by Customer Type											
Treated water delivered		√									
Raw non-potable deliveries											
Reclaimed water delivered											
Residential per capita water use											e.g. method of calculation
Unit water use (e.g. AF/account or AF/irrigated acre)											e.g. method of calculation
Indoor and outdoor treated water deliveries											e.g. estimation method
Large users											note: could either specify use of individual customers or show aggregate total
<i>Insert other demand data</i>											
Other Demand Related Data											
Irrigated landscape (e.g. AF/acre or number of irrigated acres)											specify whether total irrigated lands in service area and/or per customer types (e.g. parks)
Precipitation											
Temperature											
Evapotranspiration											
Drought index information											
Economic conditions											
Population											
New taps											
<i>Insert other demand related data</i>											

Instructions:

[1] This worksheets provides a list of possible demand data. Add additional demand data provider would like to monitor.

[2] Specifies annual reporting requirements per HB 10-1051.

[3] Select demand data provider plans to use to monitor effectiveness of water efficiency activities by inserting an "X" in appropriate boxes.

[4] Specify staff/entity responsible for data collection and evaluation.

[5] Specify the timing and/or set schedule in which data will be collected and evaluated.

[6] Add any additional comments.

WORKSHEET L - MONITORING PLAN

Selected Water Efficiency Activities [1]	Customer Category Impacted [2]	Demand Monitoring Data [3]					Other Monitoring Data [5]								Entity/Staff Responsible for Data Collection and Evaluation [6]	Schedule/ Timing of Monitoring [7]	Comments [8]
		Enter type of demand data	Enter type of demand data	Enter type of demand data	Enter type of demand data	Enter type of demand data	Description of Parameter(s) to Record [4]	Annual costs	Lessons learned	Water saving estimates	Administration data	Relevant public feedback	Records of significant changes	Insert other monitoring data			
Foundational Activities																	
List foundational activities																	
List foundational activities																	
List foundational activities																	
Targeted Technical Assistance and Incentives																	
List technical assistance and incentives activities																	
List technical assistance and incentives activities																	
List technical assistance and incentives activities																	
Ordinances and Regulations																	
List ordinances and regulations																	
List ordinances and regulations																	
List ordinances and regulations																	
Education Activities																	
List education activities																	
List education activities																	
List education activities																	

Instructions:

- [1] Provide the list of water efficiency activities selected for implementation during Step 4.
- [2] As applicable, specify which customer category (Residential, Commercial, etc.) is/would be impacted by the activity.
- [3] Enter type of demand data selected in Worksheet K (e.g. total annual treated water delivered or monthly treated water delivered by customer type). Enter an "X" for each activity that will be monitored by the respective demand data type.
- [4] If applicable, enter description of parameters to record for each activity (e.g. number of workshops, fixture/meter replacements, rebates and audits; acres of xeriscape; and length of pipeline replaced).
- [5] Select other data to be collected for monitoring of each activity by inserting an "X" in appropriate boxes.
- [6] Specify staff/entity responsible for data collection and evaluation.
- [7] Specify the timing and/or schedule in which data will be collected and evaluated.
- [8] Add any additional comments.

WORKSHEET M - ANNUAL DEMAND TRACKING SHEET

Demand Tracking Data [1]	Month [2]												Annual [3]
	January	February	March	April	May	June	July	August	September	October	November	December	
Total Water Use													
Enter demand monitoring data													
Enter demand monitoring data													
Enter demand monitoring data													
Water Use by Customer Category													
Enter demand monitoring data													
Enter demand monitoring data													
Enter demand monitoring data													
Other Demand Related Data													
Enter demand monitoring data													
Enter demand monitoring data													
Enter demand monitoring data													

Instructions:
This worksheet may be used on an annual basis to record demand data used to monitor the effectiveness of individual water efficiency activities.

[1] Enter demand data used to monitor the effectiveness of the water efficiency plan.

[2] Enter monthly demands.

[3] Insert total annual demands.

WORKSHEET N - ANNUAL MONITORING TRACKING SHEET

Selected Water Efficiency Activities [1]	Customer Category Impacted [2]	Monitoring Data [3]								Entity/Staff Responsible for Data Collection and Evaluation [6]	Date Data Recorded [7]	Comments [8]			
		Parameters [5]			Insert selected monitoring data	Insert selected monitoring data	Insert selected monitoring data	Insert selected monitoring data	Insert selected monitoring data						
		Description of Parameter(s) to Record [4]	Parameter Data	Parameter Data											
Foundational Activities															
List Foundational Activities															
List Foundational Activities															
List Foundational Activities															
Targeted Technical Assistance and Incentives															
List Targeted Technical Assistance and Incentives															
List Targeted Technical Assistance and Incentives															
List Targeted Technical Assistance and Incentives															
Ordinances and Regulations															
List Ordinances and Regulations															
List Ordinances and Regulations															
List Ordinances and Regulations															
Education Activities															
List Education Activities															
List Education Activities															
List Education Activities															

Instructions:

This worksheet may be used on an annual basis to record monitoring data to assess the effectiveness of individual water efficiency activities.

[1] Provide the list of water efficiency activities selected for implementation during Step 4.

[2] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.

[3] Enter monitoring data used to evaluate effectiveness of individual activities. These data are selected in Worksheet L.

[4] If applicable, enter description of parameters recorded for each activity (e.g. number of workshops, fixture/meter replacements, rebates and audits; acres of xeriscape; and length of pipeline replaced).

[5] Enter actual parameter data (e.g. three rebates).

[6] Specify staff/entity responsible for data collection and evaluation.

[7] Specify the date the data was recorded.

[8] Add any additional comments.

Appendix B State Policy

This appendix provides the following State policy applicable to local municipal water efficiency plans:

- Water Conservation Act of 1991
- Water Conservation Act of 2004
- Act Concerning Additional Information Regarding Covered Entities' Water Efficiency Plans and Guidelines Regarding the Reporting of Water Use and Conservation Data by Covered Entities (HB 10-1051)

Water Conservation Act of 1991

An Act

HOUSE BILL 91-1154.

FINAL COPY

BY REPRESENTATIVES Grant, Acquafresca, Adkins, Anderson, Arveschoug, Berry, Blickensderfer, DeHerrera, Dyer, Fagan, Fish, Fleming, Foster, Greenwood, P. Hernandez, Jerke, S. Johnson, Jones, June, Knox, Neale, Owen, Prinster, Redder, Reeser, Ruddick, Shoemaker, Tanner, Tucker, Webb, S. Williams, Wright, and Young;
also SENATORS Norton, Hopper, Mendez, Pascoe, and Schaffer.

CONCERNING WATER CONSERVATION, AND MAKING AN APPROPRIATION IN CONNECTION THEREWITH. *Water Conservation Plan*

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Short title. This act shall be known and may be cited as the "Water Conservation Act of 1991".

SECTION 2. Legislative declaration. The general assembly hereby finds and declares that, in view of the increasing competition and demand for water in the state of Colorado, it is the purpose of this act and the policy of the state to enhance the efficiency with which water is used to meet end uses, with the objective of making water available for all beneficial uses in Colorado.

SECTION 3. 37-60-106 (1), Colorado Revised Statutes, 1990 Repl. Vol., is amended BY THE ADDITION OF A NEW PARAGRAPH to read:

37-60-106. Duties of the board. (1) It is the duty of the board to promote the conservation of the waters of the state of Colorado in order to secure the greatest utilization of such waters and the utmost prevention of floods; and in particular, and without limiting the general character of this section, the board has the power and it is its duty:

(r) TO FOSTER THE CONSERVATION OF THE WATER OF THE STATE

OF COLORADO BY THE PROMOTION AND IMPLEMENTATION OF SOUND MEASURES TO ENHANCE WATER USE EFFICIENCY IN ORDER TO SERVE ALL THE WATER NEEDS OF THE STATE, TO ASSURE THE AVAILABILITY OF ADEQUATE SUPPLIES FOR FUTURE USES, AND TO ASSURE THAT NECESSARY WATER SERVICES ARE PROVIDED AT A REASONABLE COST.

SECTION 4. Article 60 of title 37, Colorado Revised Statutes, 1990 Repl. Vol., is amended BY THE ADDITION OF THE FOLLOWING NEW SECTIONS to read:

37-60-106.5. Study of water salvage. THE BOARD SHALL CONDUCT AN ANALYSIS OF WATER SALVAGE WHICH MAY RESULT FROM FEDERAL PROGRAMS, INCLUDING SALINITY CONTROL, AND REPORT ITS FINDINGS TO THE GENERAL ASSEMBLY BY JANUARY 1, 1992. THE STUDY SHALL BE COMPLETED WITHIN THE BOARD'S EXISTING RESOURCES.

37-60-124. Office of water conservation - creation - powers and duties. (1) THERE IS HEREBY CREATED AS AN OFFICE UNDER THE COLORADO WATER CONSERVATION BOARD THE OFFICE OF WATER CONSERVATION. THE OFFICE SHALL HAVE SUCH STAFF AS ARE NECESSARY AND APPROPRIATE TO CARRY OUT THE DUTIES ESTABLISHED FOR THE OFFICE.

(2) THE OFFICE OF WATER CONSERVATION SHALL PROMOTE WATER USE EFFICIENCY BY PERFORMING, TO THE DEGREE FEASIBLE, DUTIES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

(a) ACTING AS A REPOSITORY FOR WATER USE EFFICIENCY INFORMATION;

(b) PROVISION OF TECHNICAL ASSISTANCE TO AND WORKING WITH MUNICIPAL AND OTHER URBAN WATER PROVIDERS AND STATE AGENCIES AS THEY PLAN FOR, EVALUATE, AND IMPLEMENT WATER USE EFFICIENCY MEASURES TO PROVIDE NECESSARY WATER SERVICES;

(c) COORDINATION OF THE PLANNING FOR AND ASSISTANCE IN THE IMPLEMENTATION OF WATER USE EFFICIENCY PLANS BY STATE AGENCIES PURSUANT TO SECTION 37-96-103(4);

(d) ADMINISTRATION OF FINANCIAL ASSISTANCE FOR WATER USE EFFICIENCY MEASURES AND WATER USE EFFICIENCY PROGRAMS, AS AUTHORIZED IN SECTION 37-60-125; AND

(e) PREPARATION FOR REVIEW AND APPROVAL BY THE BOARD FOR TRANSMITTAL TO THE GENERAL ASSEMBLY SUCH INFORMATION AND RECOMMENDATIONS CONCERNING WATER USE EFFICIENCY PROJECTS AND PROPOSED WATER USE EFFICIENCY MEASURES BY STATE AND LOCAL GOVERNMENTS, INCLUDING THE ANALYSIS OF WATER USE EFFICIENCY PROGRAMS ALREADY IN PLACE.

(3) THE PERSONAL SERVICES, OPERATING, TRAVEL AND

SUBSISTENCE, CAPITAL, AND LEGAL SERVICES EXPENSES OF ADMINISTERING THE OFFICE OF WATER CONSERVATION AND THE PROGRAMS AND ACTIVITIES AUTHORIZED BY SUBSECTION (2) OF THIS SECTION MAY BE PAID FROM SUCH MONEYS AS ARE APPROPRIATED, ALLOCATED, OR OTHERWISE CREDITED TO THE COLORADO WATER CONSERVATION BOARD CONSTRUCTION FUND.

(4) THIS SECTION IS REPEALED, EFFECTIVE JULY 1, 1999.

37-60-125. Authorizations for expenditures from water conservation board construction fund for demonstration of benefits of water-efficiency - report to general assembly.

(1) THE COLORADO WATER CONSERVATION BOARD IS HEREBY AUTHORIZED TO EXPEND FIVE HUNDRED THOUSAND DOLLARS FROM THE COLORADO WATER CONSERVATION BOARD CONSTRUCTION FUND, NOTWITHSTANDING THE REQUIREMENTS OF SECTION 37-60-119 TO 37-60-122, FOR THE PURPOSE OF A PILOT PROGRAM DEMONSTRATING THE BENEFITS OF WATER EFFICIENCY MEASURES BY PROVIDING INCENTIVE GRANTS, NOT TO EXCEED FIFTY THOUSAND DOLLARS TO ANY PUBLIC AGENCY, ESTABLISHED UNDER COLORADO LAW, THAT REQUESTS ASSISTANCE IN THE DESIGN AND IMPLEMENTATION OF PILOT WATER EFFICIENCY AND CONSERVATION MEASURES.

(2) THE BOARD IS FURTHER AUTHORIZED TO EXPEND EIGHTY THOUSAND DOLLARS AND 1.5 FTE FOR THE FISCAL YEAR BEGINNING JULY 1, 1991, FOR PERSONAL SERVICES, OPERATING, TRAVEL AND SUBSISTENCE, CAPITAL, AND LEGAL SERVICES EXPENSES OF ADMINISTERING THE PILOT PROGRAM AUTHORIZED IN SUBSECTION (1) OF THIS SECTION FROM THE COLORADO WATER CONSERVATION BOARD CONSTRUCTION FUND.

(3) THE BOARD SHALL DEVELOP GUIDELINES FOR THE RANGE OF POTENTIALLY ELIGIBLE PROJECTS FOR THE PILOT PROGRAM AUTHORIZED IN SUBSECTION (1) OF THIS SECTION BY OCTOBER 1, 1991, AND SHALL ESTABLISH SUCH CRITERIA AND FEASIBILITY MEASURES AS WILL ASSURE THAT A RANGE OF POTENTIALLY BENEFICIAL PROJECTS ARE DEMONSTRATED AS PART OF THE PILOT PROGRAM.

(4) THE BOARD SHALL REPORT TO THE GENERAL ASSEMBLY BY JANUARY 1, 1995, ON THE RESULTS OF THIS PILOT PROGRAM, ALONG WITH ANY RECOMMENDATIONS ABOUT THE FUTURE OF WATER USE EFFICIENCY ACTIVITIES THAT MAY BE PROPOSED BY THE BOARD.

(5) THIS SECTION IS REPEALED, EFFECTIVE JULY 1, 1999.

37-60-126. Water use efficiency - urban water-use efficiency programs - relationship to state assistance for water facilities. (1) AS USED IN THIS SECTION, UNLESS THE CONTEXT OTHERWISE REQUIRES:

(a) "COVERED ENTITY" MEANS EACH MUNICIPALITY, AGENCY, UTILITY, INCLUDING ANY PRIVATELY OWNED UTILITY, OR OTHER

PUBLICLY OWNED ENTITY WITH A LEGAL OBLIGATION TO SUPPLY, DISTRIBUTE, OR OTHERWISE PROVIDE WATER AT RETAIL TO DOMESTIC, COMMERCIAL, INDUSTRIAL, OR PUBLIC FACILITY CUSTOMERS, AND WHICH HAS A TOTAL DEMAND FOR SUCH CUSTOMERS OF TWO THOUSAND ACRE-FEET OR MORE IN CALENDAR YEARS 1989 OR THEREAFTER.

*entity with a
tax base*

(b) "PUBLIC FACILITY" MEANS ANY FACILITY OPERATED BY AN INSTRUMENT OF GOVERNMENT FOR THE BENEFIT OF THE PUBLIC INCLUDING, BUT NOT LIMITED TO, A GOVERNMENT BUILDING, PARK OR OTHER RECREATIONAL FACILITY, SCHOOL, COLLEGE, UNIVERSITY, OR OTHER EDUCATIONAL INSTITUTION, HIGHWAY, HOSPITAL, OR STADIUM.

(2) WITHIN FIVE YEARS AFTER THE EFFECTIVE DATE OF THIS SECTION, EACH COVERED ENTITY WHICH DOES NOT HAVE A WATER USE EFFICIENCY PLAN SATISFYING THE PROVISIONS OF SUBSECTIONS (4) AND (5) OF THIS SECTION, SHALL, SUBJECT TO SECTION 37-60-127, DEVELOP, ADOPT, MAKE PUBLICLY AVAILABLE, AND IMPLEMENT A PLAN PURSUANT TO WHICH SUCH COVERED ENTITY SHALL ENCOURAGE ITS DOMESTIC, COMMERCIAL, INDUSTRIAL, AND PUBLIC FACILITY CUSTOMERS TO USE WATER MORE EFFICIENTLY. ANY COVERED ENTITY THAT MAKES AN INITIAL DETERMINATION THAT IT HAS SATISFIED SUBSECTIONS (4) AND (5) OF THIS SECTION SHALL, WITHIN FIVE YEARS OF THE EFFECTIVE DATE OF THIS SECTION, GIVE PUBLIC NOTICE OF SUCH DETERMINATION AT AN OFFICIAL MEETING OF THE APPROPRIATE GOVERNING BODY OF THE COVERED ENTITY.

*MOU
of understanding*

(3) THE MANNER IN WHICH THE COVERED ENTITY DEVELOPS, ADOPTS, MAKES PUBLICLY AVAILABLE, AND IMPLEMENTS A PLAN ESTABLISHED PURSUANT TO SUBSECTION (2) OF THIS SECTION SHALL BE DETERMINED BY THE COVERED ENTITY. THE PLAN SHALL BE ACCOMPANIED BY A PROGRAM FOR ITS IMPLEMENTATION.

(4) IN DEVELOPING A PLAN PURSUANT TO SUBSECTION (2) OF THIS SECTION, EACH COVERED ENTITY SHALL CONSIDER AT LEAST THE FOLLOWING WATER-SAVING MEASURES:

(a) WATER-EFFICIENT FIXTURES AND APPLIANCES, INCLUDING TOILETS, URINALS, SHOWERHEADS, AND FAUCETS;

(b) LOW WATER-USE LANDSCAPES AND EFFICIENT IRRIGATION;

(c) WATER-EFFICIENT INDUSTRIAL AND COMMERCIAL WATER-USING PROCESSES;

(d) WATER REUSE SYSTEMS, BOTH POTABLE AND NONPOTABLE;

(e) DISTRIBUTION SYSTEM LEAK REPAIR;

(f) DISSEMINATION OF INFORMATION REGARDING WATER USE EFFICIENCY MEASURES, INCLUDING BY PUBLIC EDUCATION, CUSTOMER WATER USE AUDITS, AND WATER-SAVING DEMONSTRATIONS;

(g) WATER RATE STRUCTURES DESIGNED TO ENCOURAGE WATER USE EFFICIENCY IN A FISCALLY RESPONSIBLE MANNER;

(h) REGULATORY MEASURES, INCLUDING STANDARDS FOR THE USE OF WATER USE EFFICIENCY FIXTURES AND LANDSCAPES, AND ORDINANCES, CODES, OR OTHER LAW DESIGNED TO ENCOURAGE WATER USE EFFICIENCY;

(i) INCENTIVES TO IMPLEMENT WATER USE EFFICIENCY TECHNIQUES, INCLUDING REBATES TO CUSTOMERS OR OTHERS TO ENCOURAGE THE INSTALLATION OF WATER USE EFFICIENCY MEASURES.

(5) THE PLAN TO BE ADOPTED UNDER SUBSECTION (2) OF THIS SECTION SHALL CONTAIN A SECTION STATING THE COVERED ENTITY'S BEST JUDGMENT OF THE ROLE OF WATER USE EFFICIENCY PLANS IN THE COVERED ENTITY'S WATER SUPPLY PLANNING.

(6) EXCEPT FOR THE ELEMENTS OF A WATER USE EFFICIENCY PLAN WHICH A COVERED ENTITY HAS ALREADY IMPLEMENTED PRIOR TO THE EFFECTIVE DATE OF THIS SECTION, THE PLAN REQUIRED UNDER SUBSECTION (2) OF THIS SECTION SHALL SET FORTH RESULTS OF THE CONSIDERATION OF THE WATER-EFFICIENT MEASURES AND TECHNIQUES SET FORTH IN SUBSECTION (4) AND ADOPTED BY THE COVERED ENTITY AFTER THE EFFECTIVE DATE OF THIS SECTION.

(7) EXCEPT FOR THE ELEMENTS OF A WATER USE EFFICIENCY PLAN WHICH A COVERED ENTITY HAS ALREADY IMPLEMENTED PRIOR TO THE EFFECTIVE DATE OF THIS SECTION, BEFORE ADOPTING ANY OTHER MAJOR ELEMENTS OF A PLAN UNDER SUBSECTIONS (2) AND (4) OF THIS SECTION, EACH COVERED ENTITY SHALL PUBLISH A DRAFT PLAN, GIVE PUBLIC NOTICE OF THE PLAN, MAKE SUCH PLAN PUBLICLY AVAILABLE, AND SOLICIT COMMENTS FROM THE PUBLIC FOR A PERIOD OF NOT LESS THAN SIXTY DAYS AFTER THE DATE ON WHICH THE DRAFT PLAN IS MADE PUBLICLY AVAILABLE. REFERENCE SHALL BE MADE IN THE PUBLIC NOTICE TO THE ELEMENTS OF A PLAN THAT HAS ALREADY BEEN IMPLEMENTED.

(8) A COVERED ENTITY MAY AT ANY TIME ADOPT CHANGES TO THE PLAN. IF THE PROPOSED CHANGES ARE MAJOR, THE COVERED ENTITY SHALL GIVE PUBLIC NOTICE OF THE CHANGES, MAKE THE CHANGES AVAILABLE IN DRAFT FORM, AND PROVIDE THE PUBLIC AN OPPORTUNITY TO COMMENT ON SUCH CHANGES BEFORE ADOPTING THEM.

(9) (a) AFTER FIVE YEARS FOLLOWING THE EFFECTIVE DATE OF THIS SECTION, ~~NEITHER THE BOARD NOR THE COLORADO WATER RESOURCES AND POWER DEVELOPMENT AUTHORITY SHALL ACCEPT AN APPLICATION FROM A COVERED ENTITY FOR FINANCIAL ASSISTANCE IN THE CONSTRUCTION OF ANY WATER DIVERSION, STORAGE, CONVEYANCE, WATER TREATMENT, OR WASTEWATER TREATMENT FACILITY UNLESS SUCH COVERED ENTITY INCLUDES A COPY OF THE WATER USE EFFICIENCY PLAN ADOPTED PURSUANT TO THIS SECTION AND A COPY OF OTHER SUCH PLANS, IF ANY, OTHERWISE ADOPTED BY THE COVERED ENTITY.~~ (1996)

(b) AFTER FIVE YEARS FROM THE EFFECTIVE DATE OF THIS SECTION, THE BOARD AND THE COLORADO WATER RESOURCES AND POWER DEVELOPMENT AUTHORITY, TO WHICH ANY COVERED ENTITY HAS APPLIED FOR FINANCIAL ASSISTANCE FOR THE CONSTRUCTION OF A WATER DIVERSION, STORAGE, CONVEYANCE, WATER TREATMENT, OR WASTEWATER TREATMENT FACILITY SHALL CONSIDER ANY WATER USE EFFICIENCY PLAN FILED PURSUANT TO PARAGRAPH (a) OF THIS SUBSECTION (9) IN DETERMINING WHETHER TO RENDER FINANCIAL ASSISTANCE TO SUCH ENTITY. SUCH CONSIDERATION SHALL BE CARRIED OUT WITHIN THE DISCRETION ACCORDED THE BOARD AND THE COLORADO WATER RESOURCES AND POWER DEVELOPMENT AUTHORITY PURSUANT TO WHICH SUCH BOARD AND AUTHORITY RENDER SUCH FINANCIAL ASSISTANCE TO SUCH COVERED ENTITY.

(c) THE BOARD AND THE COLORADO WATER RESOURCES AND POWER DEVELOPMENT AUTHORITY MAY ENTER INTO A MEMORANDUM OF UNDERSTANDING WITH EACH OTHER FOR THE PURPOSES OF AVOIDING DELAY IN THE PROCESSING OF APPLICATIONS FOR FINANCIAL ASSISTANCE COVERED BY THIS SECTION AND AVOIDING DUPLICATION IN THE CONSIDERATION REQUIRED BY PARAGRAPH (b) OF THIS SUBSECTION (9).

(10) THIS SECTION IS REPEALED, EFFECTIVE JULY 1, 1999.

37-60-127. Applicability of provisions requiring funding by political subdivisions of the state. NO PROVISION OF SECTIONS 37-60-124, 37-60-125, 37-60-126, OR 37-96-103 (4) TO (7) WHICH REQUIRES FUNDING BY ANY POLITICAL SUBDIVISION OF THE STATE WHICH IS A COVERED ENTITY AS DEFINED IN SECTION 37-60-126 (1) (a) SHALL APPLY TO ANY SUCH POLITICAL SUBDIVISION IF SUCH ENTITY SUBMITS THE APPLICABLE PROVISION AND ITS REQUIREMENTS, INCLUDING ALL COSTS TO THE INHABITANTS OF THE RESPECTIVE JURISDICTION, TO THE QUALIFIED ELECTORS OF ANY SUCH POLITICAL SUBDIVISION, AND A MAJORITY OF SUCH QUALIFIED ELECTORS DO NOT APPROVE SUCH APPLICABLE PROVISION AND ITS REQUIREMENTS.

37-60-128. Sunset of water conservation provisions - review by general assembly. SECTIONS 37-60-124, 37-60-125, 37-60-126, AND 37-96-103 (4) TO (7) ARE REPEALED, EFFECTIVE JULY 1, 1999.

SECTION 5. 37-96-103, Colorado Revised Statutes, 1990 Repl. Vol., is amended BY THE ADDITION OF THE FOLLOWING NEW SUBSECTIONS to read:

37-96-103. Requirement of water conservation in landscaping for certain public projects. (4) THE STATE OF COLORADO SHALL DEVELOP AND IMPLEMENT A PLAN TO ENHANCE WATER USE EFFICIENCY WITH RESPECT TO ANY STATE PROJECT OR FACILITY THE CONSTRUCTION OR RENOVATION OF WHICH COMMENCES AFTER JANUARY 1, 1993.

(5) IF THE STATE FACILITY OR PROJECT INVOLVES LANDSCAPING OR MAINTENANCE OF EXISTING LANDSCAPING TO ENHANCE WATER USE EFFICIENCY, A LANDSCAPING PLAN SHALL BE DEVELOPED AND IMPLEMENTED USING BEST MANAGEMENT PRACTICES WHICH SHALL INCLUDE, BUT NOT BE LIMITED TO:

(a) LIMITING TO FUNCTIONAL AREAS OF HEAVY PEDESTRIAN TRAFFIC, SUCH AS BALLFIELDS OR AREAS PROXIMAL TO ENTRYWAYS, THE LOCATIONS ON WHICH FREQUENTLY IRRIGATED AND MOWED TURF SUCH AS BLUEGRASS IS TO BE MAINTAINED, AND RESTRICTING THE USE OF TURF IN MEDIAN STRIPS;

(b) INSURING THE USE OF EFFICIENT IRRIGATION TECHNIQUES AND SYSTEMS, INCLUDING PROHIBITING LANDSCAPE IRRIGATION BETWEEN THE HOURS OF 11 A.M. AND 3 P.M.; EMPLOYING THE USE OF NONPOTABLE WATER SUPPLIES AND WATER REUSE, WHERE SUCH SUPPLIES AND WATER REUSE ARE AVAILABLE, FOR IRRIGATION OF AREAS EXCEEDING TEN ACRES; AND USING SEASONALLY VARIABLE IRRIGATION SCHEDULES WHICH MATCH THE EVAPOTRANSPIRATION NEEDS OF THE PLANTS BEING IRRIGATED;

(c) ANALYZING AND IMPROVING SOIL ON THE SITE TO MAXIMIZE MOISTURE AVAILABILITY FOR PLANT INTAKE AND TO INCREASE SOIL MOISTURE PENETRATION AND RETENTION;

(d) USING MULCHES TO REDUCE WATER NEEDS AND WEED GROWTH AND TO CHECK SOIL EROSION;

(e) USING LOWER WATER-DEMAND PLANTS, GROUND COVER, AND GRASS SPECIES TO REDUCE WATER USAGE;

(f) PLANNING FOR ROUTINE MAINTENANCE SUCH AS WEED CONTROL, PRUNING, AND IRRIGATION SYSTEM ADJUSTMENTS SO AS TO REDUCE WATER USAGE; AND

(g) USING EVAPOTRANSPIRATION DATA, WHEN AVAILABLE, TO DETERMINE WATER NEEDS.

(6) AFTER JANUARY 1, 1992, THE STATE OF COLORADO SHALL SUBJECT ALL STATE BUILDINGS TO EVALUATION THROUGH WATER AUDITS IN THOSE AREAS IN WHICH SUCH AUDITS ARE AVAILABLE FROM THE LOCAL WATER SUPPLY ENTITY.

(7) IN ALL STATE-OWNED BUILDINGS THE CONSTRUCTION OR RENOVATION OF WHICH COMMENCES AFTER JANUARY 1, 1992, WATER-EFFICIENT PLUMBING DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ARTICLE 1.3 OF TITLE 9, C.R.S., EXCEPT THAT:

(a) WHERE TANK-TYPE WATER CLOSETS ARE INSTALLED, SUCH WATER CLOSETS SHALL FLUSH WITH A MAXIMUM OF ONE AND SIX-TENTHS GALLONS OF WATER.

(b) WHERE FLUSHOMETER VALVES ARE USED, SUCH FLUSHOMETER VALVES SHALL BE THE LEAST WATER-USING TYPE FOUND TO BE SAFE AND RELIABLE.

(8) SUBSECTIONS (4) TO (7) OF THIS SECTION ARE REPEALED, EFFECTIVE JULY 1, 1999.

SECTION 6. 9-1.3-102 (4), Colorado Revised Statutes, 1986 Repl. Vol., as amended, is amended to read:

9-1.3-102. Control standards - definitions - permits.

(4) The requisite fixtures and fittings for such construction and renovation shall be:

(a) EXCEPT IN THE CASE OF FLUSHOMETER VALVES, tank-type water closets which flush with a maximum of three and one-half gallons of water;

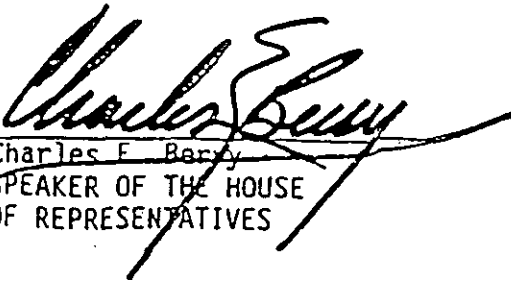
(b) Shower heads for bathing which have a maximum flow capacity of three gallons per minute AT EIGHTY POUNDS PER SQUARE INCH; and

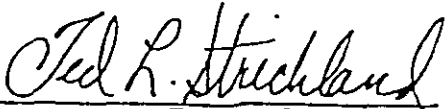
(c) Lavatory faucets and sink faucets (with--or--without aerators) which have a maximum flow capacity of two and one-half gallons per minute AT EIGHTY POUNDS PER SQUARE INCH.

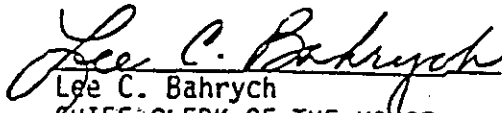
SECTION 7. Appropriation. In addition to any other appropriation, there is hereby appropriated, out of any moneys in the Colorado water conservation board construction fund not otherwise appropriated, to the department of natural resources, for allocation to the water conservation board, for the fiscal year beginning July 1, 1991, the sum of five hundred eighty thousand dollars (\$580,000) and 1.5 FTE, or so much thereof as may be necessary, for the implementation of this act.

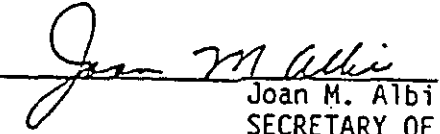
SECTION 8. Safety clause. The general assembly hereby

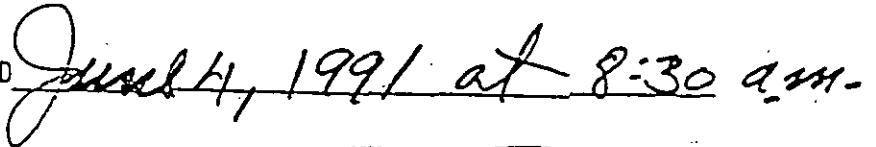
finds, determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.

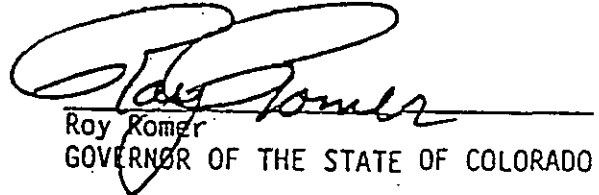

Charles F. Berry
SPEAKER OF THE HOUSE
OF REPRESENTATIVES


Ted L. Strickland
PRESIDENT OF
THE SENATE


Lee C. Bahrych
CHIEF CLERK OF THE HOUSE
OF REPRESENTATIVES


Joan M. Albi
SECRETARY OF
THE SENATE

APPROVED  June 4, 1991 at 8:30 a.m.


Roy Romer
GOVERNOR OF THE STATE OF COLORADO

Water Conservation Act of 2004

An Act

HOUSE BILL 04-1365

BY REPRESENTATIVE(S) Harvey, Frangas, May M., McFadyen, Plant, Rippy, Weissmann, and Wiens;
also SENATOR(S) Kester, Groff, Grossman, Hillman, and Tapia.

CONCERNING WATER PLANNING BY RETAIL WATER PROVIDERS.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Legislative declaration. (1) The general assembly hereby finds and declares that:

(a) Colorado was the first western state to enact statewide water conservation legislation;

(b) Water conservation and drought mitigation planning will benefit all citizens of the state of Colorado;

(c) The "Water Conservation Act of 1991", which fostered a statewide policy of improved urban water use efficiency and conservation, provides the foundation that can now be enhanced to provide new technical and financial opportunities for Colorado's communities regarding water conservation and drought mitigation planning.

(2) It is therefore the purpose and intent of this act and the policy of this state to:

(a) Encourage wise water use and conservation and drought planning by those privately and publicly owned water agencies, utilities, and others with the legal obligation to supply, distribute, or otherwise provide water through technical assistance, information dissemination, and where appropriate, financial support;

(b) Encourage the state, the Colorado water conservation board, and water providers with knowledge of water conservation and drought mitigation planning to work with other water providers in developing and implementing water conservation and water use efficiencies and managing water supplies during periods of drought;

(c) Encourage smaller water providers to take advantage of state-provided resources to support local planning efforts; and

(d) Encourage and support implementation of this act, in particular those components of this act that relate to the development and implementation of a statewide water supply initiative.

SECTION 2. 37-60-124, Colorado Revised Statutes, is amended to read:

37-60-124. Office of water conservation and drought planning - creation - powers and duties. (1) There is hereby created as an office under the Colorado water conservation board the office of water conservation AND DROUGHT PLANNING. The office shall have such staff as are necessary and appropriate to carry out the duties established for the office.

(2) The office of water conservation AND DROUGHT PLANNING shall promote water ~~use efficiency~~ CONSERVATION AND DROUGHT MITIGATION PLANNING by performing, to the degree feasible, duties including, but not limited to, the following:

(a) PARTICIPATING AS A MEMBER OR CHAIRPERSON OF ANY STATE WATER AVAILABILITY TASK FORCES ESTABLISHED TO MONITOR, FORECAST, MITIGATE, OR PREPARE FOR DROUGHT;

~~(a)~~ (b) Acting as a repository for water use efficiency CONSERVATION AND DROUGHT MITIGATION PLANNING information;

(c) DISSEMINATING WATER CONSERVATION, DROUGHT MITIGATION PLANNING, AND RELATED INFORMATION TO WATER PROVIDERS AND THE GENERAL PUBLIC;

~~(b)~~ (d) ~~Provision of~~ PROVIDING technical assistance to and working with municipal, ~~and other urban~~ INDUSTRIAL, AGRICULTURAL, AND OTHER water providers and state agencies as they plan for, evaluate, and implement water use efficiency measures to provide necessary water services CONSERVATION PLANS AND PROGRAMS, DROUGHT MITIGATION PLANS, OR BOTH;

(e) (e) Coordination of the planning for and assistance in the implementation of water use efficiency CONSERVATION plans by state agencies pursuant to section 37-96-103 (4);

~~(d)~~ (f) Administration of financial assistance for water use efficiency CONSERVATION AND DROUGHT MITIGATION PLANNING AND IMPLEMENTATION measures and ~~water use efficiency~~ programs; as ~~authorized in section 37-60-125~~; and

~~(e)~~ (g) ~~Preparation for review and approval by the board for transmittal to the general assembly such information and recommendations concerning water use efficiency projects and proposed water use efficiency measures by state and local governments, including the analysis of water use efficiency programs already in place.~~ EVALUATING WATER CONSERVATION AND DROUGHT MITIGATION PLANS RELATED TO THE USE OF SUCH PLANS BY WATER PROVIDERS TO ADDRESS WATER NEEDS AND TO PREPARE FOR WATER-RELATED EMERGENCIES BASED UPON POLICIES AND GUIDELINES ADOPTED BY THE BOARD PURSUANT TO SECTION 37-60-126.

(3) The personal services, operating, travel and subsistence, capital, and legal services expenses of administering the office of water conservation AND DROUGHT PLANNING and the programs and activities authorized by subsection (2) of this section may be paid from such moneys as are appropriated, allocated, or otherwise credited to the Colorado water conservation board construction fund.

(4) Repealed.

SECTION 3. 37-60-126, Colorado Revised Statutes, is amended to read:

37-60-126. Water conservation and drought mitigation planning - programs - relationship to state assistance for water facilities - guidelines. (1) As used in this section AND IN SECTION 37-60-126.5, unless the context otherwise requires:

(a) "Covered entity" means each municipality, agency, utility, including any privately owned utility, or other publicly owned entity with a legal obligation to supply, distribute, or otherwise provide water at retail to domestic, commercial, industrial, or public facility customers, and ~~which~~ THAT has a total demand for such customers of two thousand acre-feet or more. ~~in calendar years 1989 or thereafter.~~

(b) "OFFICE" MEANS THE OFFICE OF WATER CONSERVATION AND DROUGHT PLANNING CREATED IN SECTION 37-60-124.

(c) "PLAN ELEMENTS" MEANS THOSE COMPONENTS OF WATER CONSERVATION PLANS THAT ADDRESS WATER-SAVING MEASURES AND PROGRAMS, IMPLEMENTATION REVIEW, WATER-SAVING GOALS, AND THE ACTIONS A COVERED ENTITY SHALL TAKE TO DEVELOP, IMPLEMENT, MONITOR, REVIEW, AND REVISE ITS WATER CONSERVATION PLAN.

~~(b)~~ (d) "Public facility" means any facility operated by an instrument of government for the benefit of the public, including, but not limited to, a government building, park or other recreational facility, school, college, university, or other educational institution, highway, hospital, or stadium.

(e) "WATER CONSERVATION" MEANS WATER USE EFFICIENCY, WISE WATER USE, WATER TRANSMISSION AND DISTRIBUTION SYSTEM EFFICIENCY, AND SUPPLY SUBSTITUTION. THE OBJECTIVE OF WATER CONSERVATION IS A LONG-TERM INCREASE IN THE PRODUCTIVE USE OF WATER SUPPLY IN ORDER TO SATISFY WATER SUPPLY NEEDS WITHOUT COMPROMISING DESIRED WATER SERVICES.

(f) "WATER-SAVING MEASURES AND PROGRAMS" INCLUDES A DEVICE, PRACTICE, HARDWARE, OR EQUIPMENT THAT REDUCES WATER DEMANDS AND A PROGRAM THAT USES A COMBINATION OF MEASURES AND INCENTIVES THAT

ALLOW FOR AN INCREASE IN THE PRODUCTIVE USE OF A LOCAL WATER SUPPLY.

(2) (a) Within five years after June 4, 1991, each covered entity ~~which~~ THAT does not have a water use efficiency plan satisfying the provisions of ~~subsections~~ SUBSECTION (4) ~~and (5)~~ of this section shall, subject to section 37-60-127, develop, adopt, make publicly available, and implement a plan pursuant to which such covered entity shall encourage its domestic, commercial, industrial, and public facility customers to use water more efficiently. Any covered entity that makes an initial determination that it has satisfied ~~subsections~~ SUBSECTION (4) ~~and (5)~~ of this section shall, within five years ~~of~~ AFTER June 4, 1991, give public notice of such determination at an official meeting of the appropriate governing body of the covered entity.

(b) THE OFFICE SHALL REVIEW PREVIOUSLY SUBMITTED CONSERVATION PLANS TO EVALUATE THEIR CONSISTENCY WITH THE PROVISIONS OF THIS SECTION AND THE GUIDELINES ESTABLISHED PURSUANT TO SUBSECTION (7) OF THIS SECTION.

(c) ON AND AFTER JULY 1, 2006, A COVERED ENTITY THAT SEEKS FINANCIAL ASSISTANCE FROM EITHER THE BOARD OR THE COLORADO WATER RESOURCES AND POWER DEVELOPMENT AUTHORITY SHALL SUBMIT TO THE BOARD A NEW OR REVISED PLAN TO MEET WATER CONSERVATION GOALS ADOPTED BY THE COVERED ENTITY, IN ACCORDANCE WITH THIS SECTION, FOR THE BOARD'S APPROVAL PRIOR TO THE RELEASE OF NEW LOAN PROCEEDS.

(3) The manner in which the covered entity develops, adopts, makes publicly available, and implements a plan established pursuant to subsection (2) of this section shall be determined by the covered entity IN ACCORDANCE WITH THIS SECTION. The plan shall be accompanied by a **program** SCHEDULE for its implementation. THE PLANS AND SCHEDULES SHALL BE PROVIDED TO THE OFFICE WITHIN NINETY DAYS AFTER THEIR ADOPTION. FOR THOSE ENTITIES SEEKING FINANCIAL ASSISTANCE, THE OFFICE SHALL THEN NOTIFY THE COVERED ENTITY AND THE APPROPRIATE FINANCING AUTHORITY THAT THE PLAN HAS BEEN REVIEWED AND WHETHER THE PLAN HAS BEEN APPROVED IN ACCORDANCE WITH THIS SECTION.

(4) ~~In developing~~ A plan DEVELOPED BY A COVERED ENTITY pursuant to subsection (2) of this section ~~each covered entity shall, consider at least the following water-saving measures~~ AT A MINIMUM, CONSIDER THE

FOLLOWING PLAN ELEMENTS:

(a) THE WATER-SAVING MEASURES AND PROGRAMS TO BE USED BY THE COVERED ENTITY FOR WATER CONSERVATION. IN DEVELOPING THESE MEASURES AND PROGRAMS, EACH COVERED ENTITY SHALL, AT A MINIMUM, CONSIDER THE FOLLOWING:

(I) Water-efficient fixtures and appliances, including toilets, urinals, showerheads, and faucets;

(II) Low water use landscapes, DROUGHT-RESISTANT VEGETATION, REMOVAL OF PHREATOPHYTES, and efficient irrigation;

(III) Water-efficient industrial and commercial water-using processes;

(IV) Water reuse systems; ~~both potable and nonpotable~~;

(V) Distribution system leak IDENTIFICATION AND repair;

(VI) Dissemination of information regarding water use efficiency measures, including by public education, customer water use audits, and water-saving demonstrations;

(VII) Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner;

(VIII) The department of local affairs may provide technical assistance to covered entities that are local governments to implement water billing systems that show customer water usage and that implement tiered billing systems;

(IX) ~~Regulatory measures including standards for the use of water use efficiency fixtures and landscapes, and ordinances, codes, or other law~~ designed to encourage water use efficiency CONSERVATION;

(X) Incentives to implement water use efficiency CONSERVATION techniques, including rebates to customers ~~or others~~ to encourage the installation of water use efficiency CONSERVATION measures;

(b) ~~The plan to be adopted under subsection (2) of this section~~

~~shall contain~~ A section stating the covered entity's best judgment of the role of water ~~use efficiency~~ CONSERVATION plans in the covered entity's water supply planning;

(c) THE STEPS THE COVERED ENTITY USED TO DEVELOP, AND WILL USE TO IMPLEMENT, MONITOR, REVIEW, AND REVISE, ITS WATER CONSERVATION PLAN;

(d) THE TIME PERIOD, NOT TO EXCEED SEVEN YEARS, AFTER WHICH THE COVERED ENTITY WILL REVIEW AND UPDATE ITS ADOPTED PLAN; AND

(e) EITHER AS A PERCENTAGE OR IN ACRE-FOOT INCREMENTS, AN ESTIMATE OF THE AMOUNT OF WATER THAT HAS BEEN SAVED THROUGH A PREVIOUSLY IMPLEMENTED CONSERVATION PLAN AND AN ESTIMATE OF THE AMOUNT OF WATER THAT WILL BE SAVED THROUGH CONSERVATION WHEN THE PLAN IS IMPLEMENTED.

~~(6) Except for the elements of a water use efficiency plan which a covered entity has already implemented prior to June 4, 1991, the plan required under subsection (2) of this section shall set forth results of the consideration of the water-efficient measures and techniques set forth in subsection (4) of this section and adopted by the covered entity after June 4, 1991.~~

~~(7)~~ (5) ~~Except for the elements of a water use efficiency plan which a covered entity has already implemented prior to June 4, 1991, before adopting any other major elements of a plan under subsections (2) and (4) of this section,~~ EACH COVERED ENTITY SHALL FOLLOW THE COVERED ENTITY'S RULES, CODES, OR ORDINANCES TO MAKE THE DRAFT PLAN AVAILABLE FOR PUBLIC REVIEW AND COMMENT. IF THERE ARE NO RULES, CODES, OR ORDINANCES GOVERNING THE COVERED ENTITY'S PUBLIC PLANNING PROCESS, THEN each covered entity shall publish a draft plan, give public notice of the plan, make such plan publicly available, and solicit comments from the public for a period of not less than sixty days after the date on which the draft plan is made publicly available. Reference shall be made in the public notice to the elements of a plan that has already been implemented.

(6) THE BOARD IS HEREBY AUTHORIZED TO RECOMMEND THE APPROPRIATION AND EXPENDITURE OF SUCH REVENUES AS ARE NECESSARY FROM THE UNOBLIGATED BALANCE OF THE FIVE PERCENT SHARE OF THE

OPERATIONAL ACCOUNT OF THE SEVERANCE TAX TRUST FUND DESIGNATED FOR USE BY THE BOARD FOR THE PURPOSE OF THE OFFICE PROVIDING ASSISTANCE TO COVERED ENTITIES TO DEVELOP WATER CONSERVATION PLANS THAT MEET THE PROVISIONS OF THIS SECTION.

(7) BY JULY 1, 2005, THE BOARD SHALL ADOPT GUIDELINES FOR THE OFFICE TO REVIEW WATER CONSERVATION PLANS SUBMITTED BY COVERED ENTITIES. THE GUIDELINES SHALL DEFINE THE METHOD FOR SUBMITTING PLANS TO THE OFFICE, HOW THE OFFICE WILL PRIORITIZE THE DISTRIBUTION OF MONEYS, AND THE INTEREST RATE SURCHARGE PROVIDED FOR IN PARAGRAPH (d) OF SUBSECTION (9) OF THIS SECTION.

(8) A covered entity may at any time adopt changes to the AN APPROVED plan IN ACCORDANCE WITH THIS SECTION AFTER NOTIFYING AND RECEIVING CONCURRENCE FROM THE OFFICE. If the proposed changes are major, the covered entity shall give public notice of the changes, make the changes available in draft form, and provide the public an opportunity to comment on such changes before adopting them IN ACCORDANCE WITH SUBSECTION (5) OF THIS SECTION.

(9) (a) ~~After five years following June 4, 1991,~~ Neither the board nor the Colorado water resources and power development authority shall ~~accept an application from~~ RELEASE LOAN PROCEEDS TO a covered entity for ~~financial assistance in the construction of any water diversion, storage, conveyance, water treatment, or wastewater treatment facility unless such covered entity includes~~ PROVIDES a copy of the water use efficiency CONSERVATION plan adopted pursuant to this section; ~~and a copy of other such plans, if any, otherwise adopted by the covered entity.~~ EXCEPT THAT THE BOARD OR THE AUTHORITY MAY RELEASE SUCH LOAN PROCEEDS IF THE BOARD OR THE AUTHORITY, AS APPLICABLE, DETERMINES THAT AN UNFORSEEN EMERGENCY EXISTS IN RELATION TO THE COVERED ENTITY'S LOAN APPLICATION, IN WHICH CASE THE BOARD OR THE AUTHORITY, AS APPLICABLE, MAY IMPOSE A LOAN SURCHARGE UPON THE COVERED ENTITY THAT MAY BE REBATED OR REDUCED IF THE COVERED ENTITY SUBMITS AND ADOPTS A PLAN IN COMPLIANCE WITH THIS SECTION IN A TIMELY MANNER AS DETERMINED BY THE BOARD OR THE AUTHORITY, AS APPLICABLE.

(b) ~~After five years from June 4, 1991,~~ The board and the Colorado water resources and power development authority, to which any covered entity has applied for financial assistance for the construction of a water diversion, storage, conveyance, water treatment, or wastewater treatment

facility, shall consider any water ~~use efficiency~~ CONSERVATION plan filed pursuant to ~~paragraph (a) of this subsection (9)~~ SECTION in determining whether to render financial assistance to such entity. Such consideration shall be carried out within the discretion accorded the board and the Colorado water resources and power development authority pursuant to which such board and authority render such financial assistance to such covered entity.

(c) The board and the Colorado water resources and power development authority may enter into a memorandum of understanding with each other for the purposes of avoiding delay in the processing of applications for financial assistance covered by this section and avoiding duplication in the consideration required by ~~paragraph (b) of this subsection (9)~~.

(10) Repealed.

(11) (a) ~~On and after April 25, 2003,~~ Any new restrictive covenant that prohibits or limits the installation or use of drought-tolerant vegetative landscapes is prohibited.

(b) As used in this subsection (11), "restrictive covenant" means any covenant, restriction, or condition applicable to real property for the purpose of controlling land use, but does not include any covenant, restriction, or condition imposed on such real property by any governmental entity.

SECTION 4. Article 60 of title 37, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW SECTION to read:

37-60-126.5. Drought mitigation planning - programs - relationship to state assistance. (1) AS USED IN THIS SECTION, UNLESS THE CONTEXT OTHERWISE REQUIRES, "DROUGHT MITIGATION" MEANS THE PLANNING AND IMPLEMENTATION OF ACTIONS AND PROGRAMS USED IN PERIODS OF UNUSUAL WATER SCARCITY, WITH A COMBINATION OF ACTIONS AND PROGRAMS TAKEN BEFORE A DROUGHT TO REDUCE THE OCCURRENCE AND SEVERITY OF WATER SUPPLY SHORTAGES, AND ACTIONS AND PROGRAMS TAKEN DURING A DROUGHT TO MANAGE WATER SUPPLIES AND WATER DEMAND APPROPRIATELY.

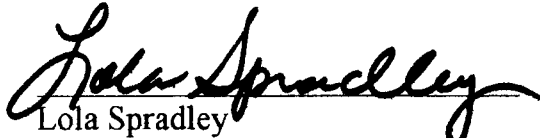
(2) THE OFFICE SHALL DEVELOP PROGRAMS TO PROVIDE TECHNICAL ASSISTANCE TO COVERED ENTITIES AND OTHER STATE OR LOCAL GOVERNMENTAL ENTITIES IN THE DEVELOPMENT OF DROUGHT MITIGATION PLANS.

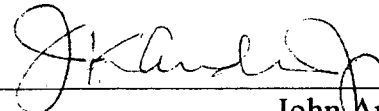
(3) THE BOARD IS HEREBY AUTHORIZED TO RECOMMEND THE APPROPRIATION AND EXPENDITURE OF SUCH REVENUES AS IS NECESSARY FROM THE UNOBLIGATED BALANCE OF THE FIVE PERCENT SHARE OF THE OPERATIONAL ACCOUNT OF THE SEVERANCE TAX TRUST FUND DESIGNATED FOR USE BY THE BOARD FOR THE PURPOSE OF ASSISTING COVERED ENTITIES AND OTHER STATE AND LOCAL GOVERNMENTAL ENTITIES TO DEVELOP DROUGHT MITIGATION PLANS IDENTIFIED AS SUFFICIENT BY THE OFFICE.


(4) BY JULY 1, 2005, THE BOARD SHALL ADOPT GUIDELINES FOR THE OFFICE TO USE IN REVIEWING AND EVALUATING DROUGHT MITIGATION PLANS SUBMITTED BY COVERED ENTITIES IN ACCORDANCE WITH THIS SECTION. THE GUIDELINES SHALL DEFINE THE METHOD FOR SUBMITTING PLANS TO THE OFFICE AND SHALL SPECIFY HOW THE OFFICE WILL PRIORITIZE THE DISTRIBUTION OF MONEYS.

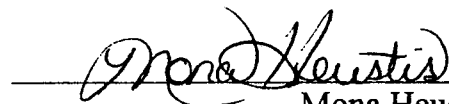
SECTION 5. Effective date. This act shall take effect at 12:01 a.m. on the day following the expiration of the ninety-day period after final adjournment of the general assembly that is allowed for submitting a referendum petition pursuant to article V, section 1 (3) of the state constitution (August 4, 2004, if adjournment sine die is on May 5, 2004); except that, if a referendum petition is filed against this act or an item, section, or part of this act within such period, then the act, item, section, or

part, if approved by the people, shall take effect on the date of the official declaration of the vote thereon by proclamation of the governor.



Lola Spradley
SPEAKER OF THE HOUSE
OF REPRESENTATIVES


John Andrews
PRESIDENT OF
THE SENATE


Judith Rodrigue
CHIEF CLERK OF THE HOUSE
OF REPRESENTATIVES


Mona Heustis
SECRETARY OF
THE SENATE

APPROVED 6/4/2004 at 11:05 A.


Bill Owens
GOVERNOR OF THE STATE OF COLORADO

**Act Concerning Additional Information Regarding Covered
Entities' Water Efficiency Plans**

and

**Guidelines Regarding the Reporting of Water Use and
Conservation Data by Covered Entities**

(HB 10-1051)

NOTE: This bill has been prepared for the signature of the appropriate legislative officers and the Governor. To determine whether the Governor has signed the bill or taken other action on it, please consult the legislative status sheet, the legislative history, or the Session Laws.



HOUSE BILL 10-1051

BY REPRESENTATIVE(S) Pommer, Fischer, Frangas, Hullinghorst,
Labuda, Looper, Pace;
also SENATOR(S) Whitehead, Carroll M., Foster, Tochtrop.

CONCERNING ADDITIONAL INFORMATION REGARDING COVERED ENTITIES'
WATER EFFICIENCY PLANS.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. 37-60-126 (4) (a) (I) and (9) (a), Colorado Revised Statutes, are amended, and the said 37-60-126 is further amended BY THE ADDITION OF A NEW SUBSECTION, to read:

37-60-126. Water conservation and drought mitigation planning - programs - relationship to state assistance for water facilities - guidelines - water efficiency grant program - repeal. (4) A plan developed by a covered entity pursuant to subsection (2) of this section shall, at a minimum, include a full evaluation of the following plan elements:

(a) The water-saving measures and programs to be used by the covered entity for water conservation. In developing these measures and programs, each covered entity shall, at a minimum, consider the following:

Capital letters indicate new material added to existing statutes; dashes through words indicate deletions from existing statutes and such material not part of act.

(I) Water-efficient fixtures and appliances, including toilets, urinals, CLOTHES WASHERS, showerheads, and ~~faucets~~ FAUCET AERATORS;

(4.5) (a) ON AN ANNUAL BASIS STARTING NO LATER THAN JUNE 30, 2014, COVERED ENTITIES SHALL REPORT WATER USE AND CONSERVATION DATA, TO BE USED FOR STATEWIDE WATER SUPPLY PLANNING, FOLLOWING BOARD GUIDELINES PURSUANT TO PARAGRAPH (b) OF THIS SUBSECTION (4.5), TO THE BOARD BY THE END OF THE SECOND QUARTER OF EACH YEAR FOR THE PREVIOUS CALENDAR YEAR.

(b) NO LATER THAN FEBRUARY 1, 2012, THE BOARD SHALL ADOPT GUIDELINES REGARDING THE REPORTING OF WATER USE AND CONSERVATION DATA BY COVERED ENTITIES, AND SHALL PROVIDE A REPORT TO THE SENATE AGRICULTURE AND NATURAL RESOURCES COMMITTEE AND THE HOUSE OF REPRESENTATIVES AGRICULTURE, LIVESTOCK, AND NATURAL RESOURCES COMMITTEE, OR THEIR SUCCESSOR COMMITTEES, REGARDING THE GUIDELINES. THESE GUIDELINES SHALL:

(I) BE ADOPTED PURSUANT TO THE BOARD'S PUBLIC PARTICIPATION PROCESS AND SHALL INCLUDE OUTREACH TO STAKEHOLDERS FROM WATER PROVIDERS WITH GEOGRAPHIC AND DEMOGRAPHIC DIVERSITY, NONGOVERNMENTAL ORGANIZATIONS, AND WATER CONSERVATION PROFESSIONALS; AND

(II) INCLUDE CLEAR DESCRIPTIONS OF: CATEGORIES OF CUSTOMERS, USES, AND MEASUREMENTS; HOW GUIDELINES WILL BE IMPLEMENTED; AND HOW DATA WILL BE REPORTED TO THE BOARD.

(c) (I) NO LATER THAN FEBRUARY 1, 2019, THE BOARD SHALL REPORT TO THE SENATE AGRICULTURE AND NATURAL RESOURCES COMMITTEE AND THE HOUSE OF REPRESENTATIVES AGRICULTURE, LIVESTOCK, AND NATURAL RESOURCES COMMITTEE, OR THEIR SUCCESSOR COMMITTEES, ON THE GUIDELINES AND DATA COLLECTED BY THE BOARD UNDER THE GUIDELINES.

(II) THIS PARAGRAPH (c) IS REPEALED, EFFECTIVE JULY 1, 2020.

(9) (a) Neither the board nor the Colorado water resources and power development authority shall release grant or loan proceeds to a

covered entity unless ~~such~~ THE covered entity provides a copy of the water conservation plan adopted pursuant to this section; except that the board or the authority may release ~~such~~ THE grant or loan proceeds NOTWITHSTANDING A COVERED ENTITY'S FAILURE TO COMPLY WITH THE REPORTING REQUIREMENTS OF SUBSECTION (4.5) OF THIS SECTION OR if the board or the authority, as applicable, determines that an unforeseen emergency exists in relation to the covered entity's loan application, in which case the board or the authority, as applicable, may impose a grant or loan surcharge upon the covered entity that may be rebated or reduced if the covered entity submits and adopts a plan in compliance with this section in a timely manner as determined by the board or the authority, as applicable.

SECTION 2. Applicability. This act shall apply to conduct occurring on or after the effective date of this act.

SECTION 3. Safety clause. The general assembly hereby finds,

determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.

Terrance D. Carroll
SPEAKER OF THE HOUSE
OF REPRESENTATIVES

Brandon C. Shaffer
PRESIDENT OF
THE SENATE

Marilyn Eddins
CHIEF CLERK OF THE HOUSE
OF REPRESENTATIVES

Karen Goldman
SECRETARY OF
THE SENATE

APPROVED _____

Bill Ritter, Jr.
GOVERNOR OF THE STATE OF COLORADO



COLORADO WATER CONSERVATION BOARD

Guidelines Regarding the Reporting of Water Use and Conservation Data by Covered Entities

INTRODUCTION

The purpose of this document is to describe the Colorado Water Conservation Board (CWCB) process to implement the *Act Concerning Additional Information Regarding Covered Entities' Water Efficiency Plans*, as approved under House Bill (HB) 10-1051. The Act calls for the Board to establish Guidelines¹ regarding the reporting of water use and conservation data by covered entities. A "covered entity" is defined as each municipality, agency, utility, including any privately owned utility, or other publicly owned entity with a legal obligation to supply, distribute, or otherwise provide water at retail to domestic, commercial, industrial, or public facility customers, and that has a total demand for such customers of two thousand acre-feet or more, per Section 37-60-126(1)(b) of the Colorado Revised Statutes (C.R.S.).

The CWCB developed these Guidelines through a public participation process that included outreach to stakeholders from water providers with geographic and demographic diversity, nongovernmental organizations, and water conservation professionals, per Section 37-60-126(4.5), C.R.S. A Technical Advisory Group was formed to provide recommendations and advise on the development of the specific data requirements and definitions in the Guidelines, focusing on technical issues, to ensure the usefulness of the data for statewide water supply planning. A Stakeholder Advisory Group expanded the perspective to provide recommendations focused on the practicality of implementing the Guidelines. Following development of the draft Guidelines with input from the advisory groups, the CWCB provided a full public review process with public comments incorporated in the final Guidelines. A briefing to the CWCB Board is provided as Attachment A which will be available in February 2012.

In developing the Guidelines, the CWCB and advisory groups considered examples of categories of customers, uses, and measurements currently reported by covered entities under existing water conservation plans, data that are anticipated to be readily available to the majority of covered entities, and data that would improve statewide water planning. Descriptions of these data for the Guidelines were developed through the advisory groups and supplemented with terminology that is utilized within the water resources industry, as identified through published professional references.²

WATER USE AND CONSERVATION DATA REPORTING GOALS AND PURPOSE

The purpose of the data reporting, per Section 37-60-126(4.5)(a), C.R.S., is to provide water use and conservation data to be used for statewide water supply planning. The data collection process described in these Guidelines, developed as part of HB10-1051, is designed to provide better, more frequent, and more reliable data than currently available. These Guidelines create standardized reporting in that each covered entity is required to report the same type of

information. However, this does not necessarily standardize the data collection process and does not require entities to change their data/billing systems to report in a particular format.

Specific reporting categories were identified to allow the data to be utilized for annual forecasting purposes and to predict how water demands for different customer categories may evolve over time, through considering potential effects of water conservation. This information will be incorporated into existing statewide water supply planning efforts, specifically but not limited to the Statewide Water Supply Initiative (SWSI) process and the CWCB's role in supporting covered entities seeking to develop and update water conservation and drought mitigation and response plans. Additionally, data reporting will help the CWCB in developing more targeted technical outreach efforts aimed at providing better local water conservation planning tools to covered entities throughout Colorado.

Water demand and conservation savings forecasts developed under the statewide water supply planning process strive to employ consistency in data collection and forecast methodology across the state and to maximize available data. The statewide and basinwide planning efforts are not intended to replace water conservation, water resources planning, nor projections prepared by local entities for project-specific purposes. This data alone will not provide useful comparisons nor is it intended to be used to provide comparisons between utilities, but will greatly improve the statewide water supply planning efforts.

The authorizing legislation for the reporting requirements is provided as Appendix A. Specific data collection and reporting needed to meet the goal of the reporting process are provided under the subsequent sections of this document. The following Guidelines have been developed pursuant to Section 37-60-126(4.5), C.R.S. and are adopted by the CWCB.

NOTE:

All water use and conservation data reporting under these Guidelines will become public record and will be available to the public through the CWCB website. The reporting under Section 37-60-126(4.5), C.R.S. does not take the place of local conservation planning or plans that must be submitted per Section 37-60-126(2), C.R.S. These data will be used for general statewide water supply planning per section Section 37-60-126(4.5(a), C.R.S. These Guidelines shall be reviewed and updated as necessary.

REPORTING REQUIREMENTS

HB10-1051 directs the Board to establish Guidelines that include clear descriptions of categories of customers, uses, and measurements. Recognizing that each covered entity is unique in its particular water supply portfolio, distribution system, and customer base, the CWCB utilized a public outreach process to establish reporting requirements that will enhance the consistency of the data that are collected, to increase the utility of data for statewide planning purposes, and to facilitate the reporting process. In developing these Guidelines, the CWCB and advisory groups recognized that it is not possible to create data reporting categories and descriptions that are universally applicable to all covered entities. The public participation process was utilized to develop reporting guidelines that relate to a broad group of covered entities. A reporting tool, as

further described under the Reporting Process section below, will support the data reporting process.

To address the unique framework of each covered entity's water distribution system and customer characterization, certain water use and water conservation data will be reported by water distribution system type and customer class. Based on advisory committee input and review of the water conservation plans on file with the CWCB, the following water distribution system categories and customer classes are anticipated to represent the majority of systems:

Water Distribution Systems:

- Potable Water,
- Non-Potable Raw Water, and
- Non-Potable Reuse (or Reclaimed) Water.

Customer Categories:

- Residential (Single Family and Multi-Family),
- Utility/Municipal Facility
- Commercial, Industrial, and Institutional (CII), and
- Irrigation Only.

A list of the water use and water conservation data categories for reporting is provided below. These data are identified specifically to improve statewide water planning. Additionally, the advisory groups encouraged covered entities to collect all of the data for the value it will add to the covered entities' individual water supply planning efforts. Recognizing that all of the data may not be immediately available from all covered entities, the majority of the data are anticipated to be readily available to the majority of covered entities, based on the advisory group input. Additional descriptions and definitions are provided in Appendix B and a draft reporting tool template is provided as Appendix C. For those covered entities that have multiple water distribution systems, as described in Appendix B, certain data will be reported for each system.

Data Categories:

- 1) Contact and Submittal Information
 - a) Contact information
 - b) Reporting date
 - c) Applicable customer categories
- 2) Water Use Data by Customer Category for each Applicable Water Distribution System
 - a) Distributed water (water produced and put into distribution system)
 - b) Wholesale water provided to another entity
 - c) Frequency of billing
 - d) Metered water use

- e) Normalizing data
 - i) Population served during reporting period
 - ii) Number of active service connections
 - iii) Number of service connections with zero use
 - f) Annual system water audit report
 - i) Billed unmetered water use
 - ii) Unbilled authorized water use
 - iii) Apparent losses
 - iv) Real losses
 - g) Supplemental information
 - i) Irrigated acreage by customer category
 - ii) Average annual gross evapotranspiration rate for service area
 - iii) Average annual total precipitation for service area
 - iv) Typical irrigation application rate for service area
 - v) Number of housing units for each residential water use category
 - vi) Return flow information
- 3) Foundational Water Conservation Program Information
- a) Percentage of meters under each type of meter reading method, by customer category for each applicable water distribution system
 - i) Unmetered
 - ii) Manual Read
 - iii) Estimated Read
 - iv) AMR
 - v) AMI
 - b) Frequency of meter readings by customer category for each applicable water distribution system
 - i) Monthly
 - ii) Bi-monthly
 - iii) Other (specify)
 - c) Type of billing rate structure by customer category for each applicable water distribution system
 - i) Declining tiered rates
 - ii) Fixed (flat) fee

- iii) Uniform rates
- iv) Inclining tiered rates
- v) Water budget-based rates
- vi) Seasonal rates
- vii) No charge
- viii) Other
- d) Details of billing rate structures by customer category for each applicable water distribution system
 - i) Tiers (number or name)
 - ii) Price per billing unit within each identified tier
 - iii) Consumption range within each rate tier
 - iv) Service charge/base rate/fixed charges
- e) Tap fees/development charges/connection charges or equivalent (if applicable)
- f) Water loss characterization
 - i) Meter testing program characteristics
 - ii) Large meter testing frequency
 - iii) Average replacement age for small meters
 - iv) Nature of leak detection program
 - v) Percent of system inspected annually for leaks
 - vi) Percent of pipe replaced annually throughout system
- g) Water conservation program staffing levels
- 4) Targeted Technical Assistance and Incentives
 - a) Management of utility/municipal facility demands
 - b) Management of largest water customer demands
 - c) Management of remaining customer demands
- 5) Ordinances and Enforcement Activities
 - a) Water provider's land use authority
 - b) Water waste ordinance information
 - c) New construction regulations information
 - d) Existing building stock/retrofit construction regulations information
- 6) Education
 - a) One-way educational programs information
 - b) One-way with feedback educational programs information

- c) Two-way educational programs information
- 7) Costs (staff time and other)
 - a) Total annual cost of water conservation program incurred by the utility/district
 - b) Annual cost breakdown by SWSI Conservation Levels categories for water conservation programs incurred by the utility/district (optional)
 - c) Total annual customer costs (optional)

REPORTING PROCESS

HB10-1051 directs the Board to establish Guidelines and describe how the Guidelines will be implemented and how data will be reported to the Board. A reporting tool will be developed to support the reporting process and allow covered entities to describe any cases where certain definitions in these Guidelines are not directly applicable to data available from the particular entity. It will also provide a location for metadata to be entered to describe how the data were prepared. Through outreach and communication, the CWCB may obtain additional information that can be used to improve interpretation of the reported data and the statewide water supply planning process. The draft reporting tool template provided as Appendix C is for illustrative purposes only. While the draft reporting tool is comprehensive and captures the full breadth of the potential reporting, the final reporting tool will be refined to customize and condense the required data reporting fields based on actual reporting information. For example, if the entity reports that it serves solely residential customers, the tool will not prompt questions related to water use or water conservation programs applicable to other customer categories.

Section 37-60-126(4), C.R.S. establishes certain processes and obligations for covered entities as well as the CWCB, as further described in this section.

A. Covered Entities

- i. For each annual report, covered entities shall utilize the current version of the data reporting tool to report the data identified in these Guidelines. Covered entities shall download the most recent version of the data reporting tool from the CWCB website (<http://cwc.state.co.us>) each January 1 for use in the previous calendar year reporting. Any updates or modifications to the data reporting tool will be completed and made available to the public by December 31 of each calendar year.
- ii. Covered entities shall submit information following the Reporting Requirements section described above for the previous calendar year to the CWCB annually by June 30, starting no later than June 30, 2014 and continuing through June 30, 2020, per Section 37-60-126(4.5)(a), C.R.S. This requirement pertains to entities meeting the covered entity definition under during Section 37-60-126(4.5)(b), C.R.S. Entities will be allowed a one year grace period once becoming a covered entity. As an example, an entity that first delivers over two thousand acre-feet in 2015 (i.e. is not a covered entity for the entire calendar year of 2015) is not required to report until June 30, 2017, for the 2016 calendar year water use and water conservation data.

Adopted by the CWCB Board
November 16, 2011

- iii. A covered entity responsible for administering a water conservation master plan approved by the Colorado Water Conservation Board's Office of Water Conservation and Drought Planning in compliance with Section 37-60-126, C.R.S (Integrated System Water Conservation Plan) shall be responsible for reporting information for all covered entity members of the Integrated System as specified under Reporting Process of these Guidelines. The covered entity responsible for creating the Integrated System water conservation plan as described in the "Guidelines for the Office to Review and Evaluate Water Conservation Plans" will be responsible for reporting all required information under House Bill 10-1051.
- iv. The statute repeals the reporting requirement as of July 1, 2020, per Section 37-60-126(4.5)(c)(II), C.R.S.

B. Colorado Water Conservation Board

- i. No later than February 1, 2012, the Board shall adopt Guidelines regarding the reporting of water use and conservation data by covered entities, per Section 37-60-126(4.5)(b), C.R.S. The Guidelines shall be adopted pursuant to the Board's public participation process and shall include outreach to stakeholders from water providers with geographic and demographic diversity, nongovernmental organizations, and water conservation professionals. The Guidelines shall include clear descriptions of categories of customers, uses, and measurements, how the Guidelines will be implemented, and how the data will be reported to the Board.
- ii. No later than February 1, 2012, the Board shall provide a report to the Senate Agriculture and Natural Resources Committee and the House of Representatives Agriculture, Livestock, and Natural Resources Committee, or their successor committees, regarding the guidelines, per Section 37-60-126(4.5)(b), C.R.S.
- iii. The data reporting tool will be accessible through the CWCB website (<http://cwcb.state.co.us>) no later than December 31, 2013. Any updates or modifications to the data reporting tool will be completed and made available to the public by December 31 of each calendar year.
- iv. Beginning June 30, 2014, the annual deadline for covered entities to report water use and conservation data will be June 30, through the year 2020. CWCB shall utilize the data in statewide water supply planning efforts, per Section 37-60-126(4.5)(a), C.R.S. Data reported under these Guidelines will support statewide water supply planning efforts by improving the quantity and quality of data available and improving consistency in the data reporting. Additionally, data reporting will help the CWCB in developing more targeted technical outreach efforts aimed at providing better local water conservation planning tools to covered entities throughout Colorado.
- v. No later than February 1, 2019, the Board shall brief the Senate Agriculture and Natural Resources Committee and the House of Representatives Agriculture, Livestock, and Natural Resources Committee, or their successor committees, on the guidelines and data collected by the Board under the guidelines, per Section 37-60-126(4.5)(c)(I), C.R.S.

All water use and conservation data reporting under these Guidelines will become public record and will be available to the public through the CWCB website. The reporting under Section 37-60-126(4.5), C.R.S. does not take the place of local conservation planning or plans that must be submitted per Section 37-60-126(2), C.R.S. These data will be used for general statewide water supply planning per section Section 37-60-126(4.5(a), C.R.S. These Guidelines shall be reviewed and updated as necessary.

¹ Per Section 37-60-126(4.5)(b), C.R.S., the board shall adopt guidelines regarding the reporting of water use and conservation data by covered entities and shall provide a report to the senate agriculture and natural resources committee and the house of representatives agriculture, livestock, and natural resources committee, or their successor committees, regarding the guidelines. These guidelines shall:

- (I) Be adopted pursuant to the board's public participation process and shall include outreach to stakeholders from water providers with geographic and demographic diversity, nongovernmental organizations, and water conservation professionals; and
- (II) Include clear descriptions of: Categories of customers, uses, and measurements; how guidelines will be implemented; and how data will be reported to the board.

² *Citizen's Guide to Colorado Water Law, 3rd Edition.* Colorado Foundation for Water Education, 2009.

Forecasting Urban Water Demand, 2nd Edition. American Water Works Association, 2008, R. Bruce Billings and Clive V. Jones.

Guidebook of Best Practices for Municipal Water conservation in Colorado. Colorado WaterWise, 2010. Prepared by Aquacraft, Inc. with support from Colorado Water Conservation Board.

SWSI Conservation Levels Analysis. Colorado Water Conservation Board, 2010. Prepared by Great Western Institute.

DRAFT SWSI Conservation Levels Analysis: Phase II Draft. Colorado Water Conservation Board, 2011. Prepared by Great Western Institute.

USEPA WaterSense Partnership Program. www.epa.gov/WaterSense/

Utility Water Loss, A Review of Current Practices in Colorado, Requirements of Other States, and New Procedures and Tools. Colorado Water Conservation Board, 2009. Prepared by Aquacraft, Inc.

Water Audits and Loss Control Programs, American Water Works Association Manual M36, Third Edition. 2009.

Water Conservation Measurement Metrics Guidance Report. American Water Works Association, Water Conservation Division Subcommittee Report, 2009. Benedykt Dziegielewski and Jack C. Kiefer.

Water Conservation Programs – A Planning Manual, American Water Works Association Manual M52, First Edition, 2006.

Guidelines Regarding the Reporting of Water Use and Conservation Data by Covered Entities

Appendix B Reporting Data Definitions

Descriptions of the data for the Guidelines were developed through the advisory groups and supplemented with terminology that is utilized within the water resources industry, as identified through published professional references.¹ The following definitions clarify specific terminology that could have multiple interpretations throughout the water industry but is not intended to be comprehensive to the extent of defining every term in the data reporting list. The definitions are intended to help provide clarity, and are not intended to promote one type of system or program over another. The metadata category of the reporting tool provides an opportunity to describe situations that are unique or need further clarification.

- 1) **Distributed Water.** The purpose of the distributed water information is to determine the total amount of water provided to end users (customers) through distribution system(s), based on water production records. This may also be referred to as “water production” data (i.e. amounts of water pumped into the distribution system). This may entail multiple types of distribution systems such as potable water delivered through a treated water system and/or non-potable water delivered as raw water or reuse. For example, surface water may be diverted from a stream, treated, and distributed as a potable water supply; ground water may be pumped from a well and distributed as a non-potable raw water supply, etc. May include stand-alone systems that are under the responsibility of the reporting entity.
 - a) **Potable Water Into a Distribution System:** Volume of treated water entering the distribution system. May include both surface and ground water supplies.
 - b) **Non-Potable Raw Water Into a Distribution System:** Volume of raw water entering the distribution system. May include both surface and ground water supplies.
 - c) **Non-Potable Reuse (or Reclaimed) Water Into a Distribution System:** Volume of reuse or reclaimed water entering the distribution system.
- 2) **Customer Categories.** Report water use data for each distribution system. The following customer categories apply to Potable Water uses and some categories may also apply to Non-Potable Raw Water and Non-Potable Reuse (or Reclaimed) water uses. The reporting tool allows reporting for each customer category within each distribution system. Based on existing water conservation plans and input from the advisory committees, the following customer categories are relevant for the majority of reporting entities. These definitions are not suggesting entities modify customer categories, rather that any exceptions be reported by describing as metadata using the reporting tool.
 - a) **Residential:** Residential water use will be differentiated by single family and multi-family uses if the covered entity tracks these customer uses separately; otherwise total residential water use may be reported.
 - (i) **Single Family:** Includes all billed and metered water use by single-family residential customers for indoor and outdoor uses served by a distribution system. Single-family

Adopted by the CWCB Board
November 16, 2011

uses may include, but are not limited to, residential single family, large residential lots, small residential lots, owners, renters, individual mobile homes and standard Single Family Equivalent taps, 5/8 inch taps, and/or 3/4 inch taps that serve single family dwellings.

- (ii) **Multi-Family:** Includes all billed and metered water use by multi-family residential customers for indoor and outdoor uses in locations both inside and outside of the city/town limits. Multi-family uses may include, but are not limited to, attached residential units (e.g. duplexes, triplexes), master-metered mobile homes, apartments, condominiums, and town homes. Note that some entities may include multi-family irrigation under “irrigation only” accounts.
- b) **Commercial, Industrial, and Institutional (CII):** Includes all billed and metered water use by CII customers for indoor and combined indoor and outdoor uses (report CII taps for outdoor-only uses under the “irrigation only” category) in locations both inside and outside the city/town limits. CII uses may include, but are not limited to, commercial businesses, industry, dairies, greenhouses, hotels, motels, restaurants, offices, breweries, military, hospitals, schools, assisted living and extended care facilities, churches, airports, fairgrounds, car washes, etc. City/Municipal/District uses may be reported separately or otherwise noted.
- c) **Municipal/Utility Facility:** Includes all billed and metered water use by the water utility, municipality, and/or the district that operates the water utility for indoor and combined indoor and outdoor uses (report Municipal/Utility facility taps for outdoor-only uses under the “irrigation only” category). Municipal/Utility Facility uses may include, but are not limited to, recreation centers, town hall, administrative buildings, hydrants, other government uses, etc. These uses may be aggregated under the CII category.
- d) **Irrigation Only:** Includes all billed and metered water use by customers for outdoor watering exclusively (report Residential taps for outdoor-only uses under the appropriate Residential category). The Irrigation Only category may include, but is not limited to, city and town parks, HOAs, open space, swim clubs, landscape uses, golf courses, etc.
- e) **Other:** Includes any other water use not captured in the above defined categories with the exception of non-revenue (a.k.a. unaccounted for) water (reported separately). Other uses may include large short-term seasonal uses (e.g., snow making), one time construction water, bulk water, etc. Explicitly report any single “other” use that is greater than 3% of the total metered water use for a particular distribution system, separate from the general “Other” category.
- f) **Wholesale:** Includes water sold by the reporting entity to another entity, for resale to the end customer.
- 3) **Metered Water Use.** The purpose of the metered water use information is to determine the demand or total amount of water used by end users (customers) indoors and outdoors. Metered water use data are typically available through billing records, with entities using a variety of billing cycle periods. Individual billing records often include information regarding the type of account (i.e. customer category), meter size, meter readings, and dates of readings. The reporting tool will allow metered water use data to be entered for each

Adopted by the CWCB Board
November 16, 2011

distribution system category of Potable Water, Non-Potable Raw Water, and Non-Potable Reuse (or Reclaimed) Water, such that outdoor and indoor uses can be determined.

- a) **Metered Water Use:** Metered water use for each customer category provided monthly, or if monthly data are not available, an estimate of monthly use from bi-monthly, quarterly, or other specified metered water use/billings.
 - b) **Average Monthly Indoor Use:** Average monthly indoor metered water use estimated for each distribution system and customer category. Average monthly indoor water use in Colorado is often projected using metered water use data for a subset of winter months, e.g. (January + February metered use) / 2. This methodology may not apply to all communities and billing cycles may affect the specific months used to estimate indoor uses. The reporting tool will allow reporting the average monthly indoor use or specification of the months in which metered water use data are most representative of indoor uses, from which CWCB may estimate the average monthly indoor use.
- 4) **Normalizing Data (or Scaling Variables).** The purpose of the normalizing data is to allow water use to be evaluated on a common unit basis and to add perspective to water use trends.
- a) **Population Served During Reporting Period:** Permanent (total year-round) residential population served reported along with the source of information (e.g. census and state demographer data). Recognizing that entities are affected differently by transient populations associated with students, tourism, jobs, military, etc., indicate whether the population is affected by these and provide an estimate if available, along with the source of information.
 - b) **Number of Active Service Connections:** Monthly number of active/billed customer accounts (service connections) by customer category.
 - c) **Number of Service Connections with Zero Use:** Monthly number of customer accounts (service connections) with zero consumption, by customer category. This may include accounts that are temporarily inactive but anticipated to come back on-line at a future date, accounts with zero use during portions of the year, etc.
- 5) **Annual Audit Report:** The purpose of the annual audit reporting data is to obtain information on water audit and loss control through real and apparent loss data. The American Water Works Association (AWWA) has developed a standard methodology for determining water loss for municipal water providers (2009 AWWA M36 Manual of Practice – *Water Audits and Loss Control Programs (3rd Edition)*). For systems in which the following data cannot be provided, the CWCB will estimate real losses as the total Distributed Water minus total Metered Water Use. The sum of total Metered Water Use, apparent losses (unauthorized consumption), and real losses should equate to the total Distributed Water.
- a) **Billed Unmetered Water Use:** Any unmetered water use such as customers billed at a flat rate. May also be used to account for metered uses with meters known to be highly nonfunctional, highly inaccurate, or readings are unobtainable in which case, estimates of water use are used in place of measured water use.

- b) **Unbilled Authorized Water Use:** Any kind of authorized water use which is unbilled (metered or unmetered). Typically describes water taken irregularly in a variety of manners from nonaccount connections that typically do not supply permanent structures. May include, but is not limited to, fire fighting, flushing of mains and sewers, street cleaning, construction, water treatment facility backwash water, etc.
 - c) **Apparent Losses:** Nonphysical losses that occur when water is successfully delivered to the customer but, for various reasons, is not measured or recorded accurately. Includes losses in customer water use attributed to inaccuracies associated with customer metering, systematic data handling error, plus unauthorized water use (theft or illegal use of water). May include, but is not limited to, water illegally withdrawn from hydrants, illegal connections, meter equipment tampering, adjustments to metered water use for meter under- or over-registration, and billing adjustments.
 - d) **Real Losses:** Physical water losses from the distribution system, up to the point of the customer's meter. May include, but is not limited to leakage from water mains and customer service connection pipes, joints, and fittings (the largest component by volume for most systems), storage tank overflows, or similar operator error.
- 6) **Supplemental Information:** Recognizing that the following information may not be available for many covered entities, it is requested to the extent that it is readily available or can be estimated within reasonable levels of effort.
- a) **Irrigated Acres:** Best estimate of irrigated acres served by each customer category, including source of information.
 - b) **Average Annual Gross Evapotranspiration Rate for Service Area:** Average local inches of gross evapotranspiration for service area during reporting period, including source of information and method used.
 - c) **Average Annual Total Precipitation for Service Area:** Average local total inches of precipitation for service area during reporting period, including source of information.
 - d) **Irrigation Application Rate:** Application rate of outdoor use in gallons per square foot of irrigated area, including source of information.
 - e) **Number of Housing Units:** Total number of households for each residential customer category. Recognizing that data for the Multi-Family category may require audits and information on occupancy rates, provide and estimate if available along with the source of information.
 - f) **Return Flows:** Water that returns to streams, rivers, and aquifers after it has been applied to beneficial use. It may return as surface flow or as ground water flow.
- 7) **Meter Types:** Specify the percentage of meters under each type of meter reading method, by customer category, for each applicable water distribution system.
- a) **Manual Read:** Manual meter reading with reading personnel physically visiting individual meters to collect readings.
 - b) **Estimated Read:** Estimated meter reading based on historical trends from past meter readings.

- c) **AMR:** Automatic meter reading where radio signals transmit the current meter reading to a device outside of the building or meter pit in which the meter is located. Mobile AMR systems allow readings to be collected by readers with hand-held devices or via automobiles patrolling scheduled meter reading routes. Fixed network AMR include permanently installed data collector units located throughout the service area.
 - d) **AMI:** Advanced metering infrastructure, also referred to as smart meters, goes beyond AMR to include networking technology (telemetry) for remote leak detection, frequent meter data collection, and two-way communication between customer and utility.
- 8) **Rate Structures:** Provide information by customer category, for each applicable water distribution system. The reporting tool will provide an option to attach the entity's current rate structure for each customer class.
- a) **Declining tiered rates:** Lower rate charges for higher quantities of water use.
 - b) **Fixed (flat) fee:** Fixed fee (charge) regardless of how much water is used.
 - c) **Uniform rates:** Same unit charge for water regardless of how much water is used.
 - d) **Inclining tiered rates:** Higher unit charges are triggered at higher levels of water use.
 - e) **Water budget-based rates:** A variation of increasing tiered rates, where tailored allocations are developed for each customer and rates increase as the allocation is used or exceeded. Tier (or block) size is typically defined by an empirical determination of efficient use for each customer using customer specific characteristics such as irrigable area.
 - f) **Seasonal rates:** Higher prices are charged during periods of scarcity (typically summer and fall) to more efficiently allocate water in times of shortage.
- 9) **Educational Programs:** Provide information on the types of educational programs and estimates of number of customers reached with each program.
- a) **One-Way Education:** One-way educational efforts send out information without tracking or specific follow-up (e.g. bill stuffers).
 - b) **One-Way With Feedback Education:** One-way "with feedback" educational efforts send out information and allow for some level of tracking or feedback (e.g. K-12 classroom presentations and interactive websites).
 - c) **Two-Way Education:** Two-way educational efforts involve two-way communications (e.g. focus groups).
- 10) **Point of Sale Controls:** Ordinance/regulation to provide opportunity to ensure the water efficiency features meet current regulations and/or to incentivize increased efficiency through retrofit of fixtures, appliances, landscape, and irrigation systems. Requirements can be triggered before a residence or building can be sold, transferred from one owner to another, or renovated beyond a predetermined level.

- 11) Costs:** Costs incurred by the utility/municipality/district may be reported as a total over the past reporting period, or as a breakdown by the SWSI Level categories. See the SWSI Conservation Levels Analysis Phase II Report for more information on the categories.

¹ *Citizen's Guide to Colorado Water Law, 3rd Edition*. Colorado Foundation for Water Education, 2009.

Forecasting Urban Water Demand, 2nd Edition. American Water Works Association, 2008, R. Bruce Billings and Clive V. Jones.

Guidebook of Best Practices for Municipal Water conservation in Colorado. Colorado WaterWise, 2010. Prepared by Aquacraft, Inc. with support from Colorado Water Conservation Board.

SWSI Conservation Levels Analysis. Colorado Water Conservation Board, 2010. Prepared by Great Western Institute.

DRAFT SWSI Conservation Levels Analysis: Phase II Draft. Colorado Water Conservation Board, 2011. Prepared by Great Western Institute.

USEPA WaterSense Partnership Program. www.epa.gov/WaterSense/

Utility Water Loss, A Review of Current Practices in Colorado, Requirements of Other States, and New Procedures and Tools. Colorado Water Conservation Board, 2009. Prepared by Aquacraft, Inc.

Water Audits and Loss Control Programs, American Water Works Association Manual M36, Third Edition. 2009.

Water Conservation Measurement Metrics Guidance Report. American Water Works Association, Water Conservation Division Subcommittee Report, 2009. Benedykt Dziegielewski and Jack C. Kiefer.

Water Conservation Programs – A Planning Manual, American Water Works Association Manual M52, First Edition, 2006.

Municipal Water Efficiency Plan Guidance Document				
Section:	GENERAL			
Page #	Sub-Section #	Comments	Author	Questions/Notes
All	All	Overall, we believe the final document is very well organized and has been a very successful stakeholder collaboration. Much credit is due to CWCB staff, AMEC, and the other stakeholders for their time and input on this document.	Aurora Water	Comment noted.
2	All	Throughout the document, i.e. is used incorrectly where it should be e.g.	Aurora Water	Comment noted; corrections made.
n/a	Template	It would be helpful if more clarification was provided regarding the designations of Statute, Essential, Beneficial, Public, and Documentation, to make it clear what is required for efficiency plans and what is not. This could be accomplished by combining the Statute and Essential designations into one "Required" designation and more clearly explaining the difference between Beneficial, Public, and Documentation.	Denver Water	Comment noted; the Statute and Essential designations were combined in a "Required" designation. Definitions for beneficial, public and documentation were updated to provide additional clarification.
n/a	All	This is a great example of micromanagement. What makes the State/CWCB think that they can impose this on water providers. The plan asks for information that is impossible for Ute to provide when you ask for me to report irrigation district information.	Larry Clever, Ute Water Conservancy District	Comment noted. The statute that informs this guidance document has existed since 1991 and was revised in 2004. Over 50 water providers have created plans that provide the type of information that is required for the plans. If a water provider has no authority or control over a required element the CWCB has been and will be flexible in these circumstances.
n/a	All	The plan is written and will be administered by a person that has never worked for a water district. What makes that person qualified?	Larry Clever, Ute Water Conservancy District	Comment noted. Presently, the CWCB staff member reviewing water conservation plans has over 7 years experience in creating, implementing and managing water conservation programs at the municipal level plus 3 years at the state level working with local water providers on their water conservation plans and programs.
n/a	All	If you have a water provider on CWCB ask them if they want to write a plan and provide all of this information.	Larry Clever, Ute Water Conservancy District	Comment noted.
n/a	All	What happened to the Governor's executive order about the state funding new mandates?	Larry Clever, Ute Water Conservancy District	Comment noted. The statute that informs this guidance document has existed since 1991 and was revised in 2004.
n/a	All	CWCB should toss this document into the trash and do something worthwhile.	Larry Clever, Ute Water Conservancy District	Comment noted.
n/a	All	In regards to "Dual Water Supply Systems": Ute Water, along with the other three domestic water providers in the Grand Valley, obtains no authority over the management or reporting of irrigation water providers in our service districts. An example of our concern with the Dual Water Supply Systems is the Document's suggested installation of a raw water metering systems.	Joseph R. Burtard, Ute Water Conservancy District	Comment noted; Dual Water Supply Systems were included in the document as a resource for those providers that have dual systems, and have control over those systems, to help them include these systems in their water conservation programs. This is not required but is a resource to help them integrate them is they choose and if they are able to.

Public Review Comments

Section:	GENERAL			
Page #	Sub-Section #	Comments	Author	Questions/Notes
n/a	All	The reporting of confidential and/or sensitive information. For example; The Document request that we identify high use residential customers and general information about our facilities. Please keep in mind that the method of reporting this type of data needs to remain under our discretion for privacy, legal and security reasons.	Joseph R. Burtard, Ute Water Conservancy District	Comment noted; The Guidance Document is an educational tool for providers to enhance their efficiency programs and is intended to be a reference document for everyone from the large to the small providers. The Guidance Document does not request anyone to identify their high use residential customers and call them out in the plan. The section discusses focusing the limited resources of water providers on the customers that will yield the most cost effective results. Identifying high water use customers would strictly be an internal exercise by the water provider so as to focus their limited resources more effectively. The State recognizes that some providers are in a better position to apply some of these ideas, while others are limited by resources and may only be able to do the minimum Statute requirements which are specified in the template.
n/a	All	Public Participation with Implementation and Monitoring: This section seems unreasonable based off of the current guidelines (2005 version). It will require a lot of unnecessary coordination and cost among the providers for little to no public participation. I personally understand the value in public participation but in no way do I support what is being asked of water providers in this section of the Document. (Page 64)	Joseph R. Burtard, Ute Water Conservancy District	Comment noted; The Guidance Document is an educational tool for providers to enhance their conservation programs and is intended to be a reference document for everyone from the large to the small providers. Pg. 64 simply lists a number of examples that providers can use if they choose. Although implementation and monitoring are required as part of a plan, these are only examples to give ideas and are not all required to be carried out as they are listed.
n/a	All	My position will be the one tracking and updating this data/plan. I am concerned with the amount of logistical time it is going to take to obtain, track and update this plan as a direct result of unnecessary requirements. My concern extends to providers with even less resources then I have.	Joseph R. Burtard, Ute Water Conservancy District	The Guidance Document is an educational tool for providers to enhance their efficiency programs and is intended to be a reference document for everyone from the large to the small providers. The template differentiates between what is required by the State and what is recommended (beneficial, public, document) for the plan. One of the main goals (pg. 1) of the Guidance Document is to, "Provide guidance to Colorado municipalities that are diverse due to geographic location, size, water supply sources and financial resources."

Section:		GENERAL		
Page #	Sub-Section #	Comments	Author	Questions/Notes
n/a	All	The plan is governed and enforced by one individual position. Therefore, the content approval and debate remains at the discretion of one person.	Joseph R. Burtard, Ute Water Conservancy District	Comment noted; one of the main goals (pg.1) of this Guidance Document is to, "Clearly specify the plan elements required for State approved plans per the Water Conservation Act of 2004." Content approval and debate have been greatly diminished by this latest version. While one person is in charge of reviewing and providing technical assistance on these plans, the CWCB makes a point of working closely with the submitting water providers to ensure flexibility in the planning process with the end goal of making the best water conservation plan possible for that water provider. This Guidance Document improves on the previous Guidance Document significantly by providing more resources to draw upon, providing more examples to work with and creating the Template by which the required elements are differentiated from the recommended elements.
n/a	All	Areas of this Document attempt to micromanage providers. Example; regulating peak day water usage (page 50). This level of decision needs to remain at the influence and authority of each individual provider's governing board and management. Each water provider is unique in their own way. We can't stress enough that a unification of a water conservation management program needs to take into consideration the needs, limitations, and objectives of each individual provider. therefore, making it impossible to have one set standard enforced amongst every provider who submits a efficiency plan.	Joseph R. Burtard, Ute Water Conservancy District	Comment noted; The Guidance Document is an educational tool for providers to enhance their efficiency programs and is intended to be a reference document for everyone from the large to the small providers. The example of peak day usage is only an example. Many providers have this issue with their systems. CWCB is in agreement that every water provider must take into consideration the needs, limitations and objectives of their water system. The Guidance Document explains at length that each water provider should examine their supply portfolio, supply reliability, their system needs and limitations as well as their possible future demands. The water provider would then examine what goals and benefits could come from a water efficiency program and what needs and limitations these water efficiency programs could satisfy. After that, the water provider would be ready to select certain water efficiency programs for implementation that would address the system needs and limitations that were identified earlier in the process. This Guidance Document illustrates examples and processes so that a local water provider is able to determine which water efficiency programs are most appropriate for their system.
n/a	All	I left you a voicemail in hopes to clarify our position on this Document. I feel like these guidelines will help water providers, such as ourselves, eliminate third party consultants; saving water providers from spending unnecessary resources (time and money) in the development of this plan. Unfortunately, I am stretched thin with other responsibilities, so this e-mail will have to take the place of Ute's formal position.	Joseph R. Burtard, Ute Water Conservancy District	Agreed, the Guidance Document is an educational tool for providers to enhance their efficiency programs and is intended to be a reference document for everyone from the large to the small providers.

Section:	GENERAL			
Page #	Sub-Section #	Comments	Author	Questions/Notes
n/a	All	Douglas County Water Resource Authority (DCWRA) is committed to water resource conservation. Our twenty member organizations represent a population of approximately 325,000 Colorado citizens in the South Metro area of Arapahoe and Douglas Counties. Our members are currently reliant upon Denver Basin Groundwater, an essentially non-renewable water supply. The efficient use of water is therefore very important to us. To that end, one of our members was the first water provider entity to have a modern water conservation plan approved by CWCB. Additionally, our region is the first in Colorado to have 100% compliance from covered entities – every such entity has had a water conservation plan approved by CWCB.	Mark Shively, Douglas County Water Resource Authority	Comment noted.
n/a	All	Recent CWCB studies indicate our area has experienced a 32% reduction in per capita water use over the past ten years, to the 146 GPCD level. And so others water entities in the State who have not yet developed their water efficiency programs may want to hear of our experiences on this topic, including comments on the Draft Municipal Water Efficiency Plan Guidance Document	Mark Shively, Douglas County Water Resource Authority	Comment noted.
n/a	All	We believe the Draft Municipal Water Efficiency Plan Guidance Document is a good resource for putting together a water efficiency plan. It is very comprehensive and provides a great amount of information about what should be considered when developing a water efficiency plan.	Mark Shively, Douglas County Water Resource Authority	Comment noted.
n/a	All	Our concern is that the document sets inaccurate expectations about what is actually required by the Water Conservation Act of 2004. Colorado Revised Statute 37-60-124 sets clear requirements for what shall be included in a Water Conservation (Efficiency) Plan. While the guidance document provides a wealth of information that may or may not be necessary to water efficiency planning, the document does not provide a concise template and/or checklist detailing what is required for approval by the state.	Mark Shively, Douglas County Water Resource Authority	Comment noted; The template has been redesigned to show what is required in the plan based on statute and what is beneficial, public, and documentation. All required items must be included in a State approved plan.
n/a	All	It is our recommendation that the guidance document should include a section dedicated to the specific requirements needed for approval. There are many entities that will be developing these water efficiency plans that understand all of the considerations needed when developing a water efficiency plan that will play a role in their overall water supply planning. These entities can benefit from an abbreviated version of the guidance template showing state requirements. While the guidance template is very robust; 1) It does not necessarily reflect what is required for approval; 2) It may not be a fit all water providers; 3) The guidance template sets an expectation that may not be a realistic fit for all water providers.	Mark Shively, Douglas County Water Resource Authority	Comment noted; the template has been redesigned to show what is required in the plan based on statute and what is beneficial, public, and document. All required items must be included in a State approved plan. Providers with limited resources may only include these required items in their plan. The template also provides a variety of additional items that can benefit an efficiency program. These additional items will make a plan stronger but the CWCB recognizes that there is a limit to the resources that can be devoted to the plan development. One of the main goals (pg. 1) of the Guidance Document is to, "Provide guidance to Colorado municipalities that are diverse due to geographic location, size, water supply sources and financial resources."

Public Review Comments

Section:		GENERAL		
Page #	Sub-Section #	Comments	Author	Questions/Notes
n/a	All	<p>We also feel that providing a clear template of what is required for approval will benefit the review process. Our members have expressed concern about the length of the review process once a plan is submitted. If clear expectations are established through the guidance document, the review of the plan should be much more efficient.</p>	Mark Shively, Douglas County Water Resource Authority	<p>Comment noted; The template has been redesigned to show what is required in the plan based on statute and what is beneficial, public, and document. All required items must be included in a State approved plan. One of the main goals (pg.1) of this Guidance Document is to, "Clearly specify the plan elements required for State approved plans per the Water Conservation Act of 2004."</p>

Municipal Water Efficiency Plan Guidance Document				
Section:	1.0	INTRODUCTION TO THE MUNICIPAL WATER EFFICIENCY GUIDANCE DOCUMENT		
Page #	Sub-Section #	Comments	Author	Questions/Notes
4	1.3	section 4.0 is bulleted three times when it should be 4.0, 5.0, 6.0	Lindsay Weber, Denver Water	Comment noted; correction made.
4	1.3	p. 4 - The section numbering seems to be off, showing three different sections as being Section 4.	Paul Fanning, Pueblo Water	Comment noted; correction made.
1	1	it's not until page 9, section 3.1 that the report defines "covered entities" as retail providers that sell 2,000 ac-ft or more on an annual basis. I suggest that you put something right up front, in the first sentence of 1.0 and on the cover, that sets forth applicability threshold so that those who are not affected don't panic.	Peter Nichols, Trout, Raley, Montano, Witwer & Freeman, PC	Comment noted; covered entity language added to introduction.
3	1.2	First paragraph: after non-potable water...it should read "(e.g., reclaimed water, untreated ditch water, and groundwater)"	Aurora Water	Comment noted; change made.
4	1.3	Section 4.0 is repeated 3 times, it should be replaced with Section 5.0 and Section 6.0	Aurora Water	Comment noted; correction made.
4	1.3	Appendix C should be eliminated since HB 1051 is now included in Appendix B	Aurora Water	Comment noted; Appendix C was eliminated.
4	1.3	Section 4 continues instead of increasing to 5 and 6 for the bullet points.	Northern Water	Comment noted; correction made.
Section:	2.0	OVERVIEW OF WATER EFFICIENCY PLANNING		
Page #	Sub-Section #	Comments	Author	Questions/Notes
5	2.1.1	p. 5 - Extraneous comma after "While" in the third paragraph	Paul Fanning, Pueblo Water	Comment noted; correction made.
6	2.1.4	Paragraph 1 - change "response strategies that can provide temporary relief" to "response strategies that can provide temporary and immediate relief"	Lindsay Weber, Denver Water	Comment noted; change made.
7	2.1.4	Last sentence of the second paragraph should read "It is recommended that drought strategies be included..."	Aurora Water	Comment noted; change made.
7	2.3.1	p. 7 - Shouldn't "Prohibit landscape irrigation" " be "Limit landscape irrigation?" (Third item in list table)	Paul Fanning, Pueblo Water	Comment noted; change made.
7	2.1.2	In Table 1, "Prohibit water from November to March" is considered only a short-term response strategy, but could also be used as a long term mitigation. An example of this would be the city of Greeley, that has a similar policy in place year round.	Northern Water	Comment noted; change made.
Section:	3.0	ROLE OF THE STATE IN WATER EFFICIENCY PLANNING		
Page #	Sub-Section #	Comments	Author	Questions/Notes
9	3.1	Last sentence of the fourth paragraph states HB1051 requirements are spelled out in the Template. This is not necessarily true. Maybe it would be beneficial to add a 6th checklist column in the Template to explicitly list the requirements of HB1051.	Aurora Water	Comment noted; the HB 1051 requirements are called out in the template using the Statute number (in parentheses) rather than the house bill number.
Section:	4.1	Profile of Existing Water Supply System		
Page #	Sub-Section #	Comments	Author	Questions/Notes
13	4.1.1	change "sketch" to "illustration"	Lindsay Weber, Denver Water	Comment noted; change made.
14	4.1.2	define a "critical drought year"	Lindsay Weber, Denver Water	Comment noted; definition added as a footnote.
13	4.1.1	Last sentence of first paragraph, change "where City's water comes from" to "a particular entity's water resources"	Aurora Water	Comment noted; change made.
16	4.1.3	p. 16, first paragraph - "master plants" should be "master plans"	Paul Fanning, Pueblo Water	Comment noted; correction made.

Municipal Water Efficiency Plan Guidance Document				
Section:	4.2	Profile of Water Demands and Historical Demand Management		
Page #	Sub-Section #	Comments	Author	Questions/Notes
17	4.2.2	additional bullets for examples of such challenges: portions of the service area may be metered but not read or put into the database, bimonthly billing practices, and data errors.	Lindsay Weber, Denver Water	Comment noted; the first and third suggested examples were added.
17-22	4.2.2	Figures 5, 6, 7, 8, and 9 should show tables instead of graphs because I assume you would the actual numbers	Lindsay Weber, Denver Water	Comment noted; tables were added in addition to the figures.
22	4.2.2 - Per capita demands by customer type	We do this differently since there is no "population" to divide by for non-residential categories. It may make more sense to divide the demand of non-residential customer types by the number of accounts in that category. Or just take this part out since nonresidential per capita use doesn't provide any information about efficiency.	Lindsay Weber, Denver Water	Comment noted; changed per capita demands to unit demands and addressed possibility of also looking at customer demands by account.
24	4.2.2	add "varying weather conditions/climate" to the list of factors that can skew system-wide per capita demands	Lindsay Weber, Denver Water	Comment noted; discussion on weather conditions was added as a footnote.
25	4.2.2	equation 1 and 2 are not there	Lindsay Weber, Denver Water	Comment noted; there is a bug with converting word documents into PDF format. Equations disappear. CWCB will remedy this in final version.
26 and 42,	4.2.3	the box says "as a percentage", but as a percentage of what?	Lindsay Weber, Denver Water	Comment noted: statutory language cannot be changed through this guidance document process. CWCB interprets it as the % of total demand. Clarifying language was added.
26	4.2.3	It is difficult to estimate the amount of water saved through previous demand management efforts, so you will need to be flexible with this interpretation.	Lindsay Weber, Denver Water	Comment noted; the CWCB understands it can be difficult for some providers to estimate past water savings. The CWCB has always been flexible with working with providers to come up with reasonable estimates for past water savings.
27	4.2.3	change "(ie public education programs)" to "(ie public education programs, advertising, and marketing)"	Lindsay Weber, Denver Water	Comment noted; change made.
27	4.2.3	the first sentence under "water saving estimates using demand data" - should be "water demand to before and after the implementation"	Lindsay Weber, Denver Water	Comment noted; change made.
29	4.2.3 - footnote	accelerated passive savings are no longer passive savings.	Lindsay Weber, Denver Water	Comment noted; discussion on accelerated passive savings was removed.
30	4.2.3 - paragraph 2	That paragraph describes a big assumption that should be softened. A downward indoor per capita water usage trend cannot be assumed to be completely due to passive savings. There may be some active savings or other unknown influences causing that trend.	Lindsay Weber, Denver Water	Comment noted; footnote was added to address this issue.
30	4.2.3	Equation 3 is not there	Lindsay Weber, Denver Water	Comment noted; there is a bug with converting word documents into PDF format. Equations disappear. CWCB will remedy this in final version.
	4	Demand factors are also influenced by economic conditions and vacancy rates. Water Providers must be careful not to base their demands for projections on data un-adjusted for conditions.	Stu Feinglas-Westminster	Comment noted; footnote added in Section 4.2.4 to address issue.
	4	Outdoor water demands should be adjusted for actual weather conditions to project water use and not adjusted when determining average to peak year ratios.	Stu Feinglas-Westminster	Comment noted; footnote added in Section 4.2.3 to address the importance of incorporating weather dynamics when evaluating peak-day demands and for projecting future outdoor water supplies.
	4	The one thing I didn't add, I could do it if you want me to, is a couple of sentences to caution that the more simplistic (per capita alone) the method for projecting future demand, the more likely it is to miss potential demands or even future reductions.	Stu Feinglas-Westminster	Comment noted; sentence added in 4.2.4 stating the providers may also consider other factors such as the economy and climate change when developing demands and that demand projections should be revisited on a regular basis to ensure that they are reflective of available current data.
25	4.2.2	Equation 1 and Equation 2 are missing	Aurora Water	Comment noted; there is a bug with converting word documents into PDF format. Equations disappear. CWCB will remedy this in final version.

25	4.2.2	First sentence of second paragraph should start with "Figure 12" instead of "0"	Aurora Water	Comment noted; correction made.
27	4.2.3	Suggest removing the example on calculating savings for toilet replacements. In our experience, this method grossly overestimates water savings, and it is better to estimate savings based on reduction in winter quarterly average. We do not think this method should be recommended when calculating water savings.	Aurora Water	Comment noted; while Aurora has a sophisticated method for estimating demands, many providers do not have the available resources to apply such techniques. The example calculations is a starting point for these providers.
27	4.2.3	According to the second paragraph, the savings tied to education activities are difficult to quantify. If this is true, then how can anyone report this number in the worksheets with any level of accuracy? Maybe make it optional (rather than essential) to report water savings for educational activities, and just emphasize educational activities support other water efficiency activities and are embedded into the other water saving estimates.	Aurora Water	Comment noted; the Statute requires an estimate of water savings, however, that said we understand that the savings can be difficult to quantify. Language was added to Section 4.2.3 to address this and a variety of techniques are provided for developing high level estimates. Water savings may also be provided for groups of water efficiency activities.
30	4.2.3	Equation 3 is missing.	Aurora Water	Comment noted; there is a bug with converting word documents into PDF format. Equations disappear. CWCB will remedy this in final version.
21	4.2.2	p. 21, second complete paragraph - delete "are" after "water users"	Paul Fanning, Pueblo Water	Comment noted; corrected
21	4.2.2	p. 21 - should be "whether the City can improve ITS irrigation efficiency."	Paul Fanning, Pueblo Water	Comment noted; corrected
29	4.2.3	p. 29 - Should not be "comprised of." Correct usage is "Demand management water savings comprise active savings and passive savings." (This may be extreme language geekery on my part, but comprise is a verb.)	Paul Fanning, Pueblo Water	Comment noted; corrected
30	4.2.3	p. 30, second paragraph - I believe "per capita water savings" should be "per capita water usage"	Paul Fanning, Pueblo Water	Comment noted; corrected
26	4.2.3	It would be helpful if the CWCB was flexible with the interpretation of CRS 37-60-126(4) on page 26, because it can be difficult to estimate the amount of water saved through previous demand management efforts. It is especially difficult to quantify savings from water efficiency programs such as education, marketing, advertising, rate structures, and audits. More language could be added that describes how to estimate savings.	Denver Water	Comment noted; the difficulties encountered when estimating savings is addressed in Section 4.2.3. This includes suggested techniques on how to estimate savings for certain activities.
25	4.2.2	First sentence below the title "Indoor and Outdoor Demands" has a "0." Not sure what is missing, but the sentence does not make sense.	Northern Water	Comment noted; corrected
27	4.2.3	Under "Water Saving Estimates Using Demand Data," the third sentence is worded oddly. A suggestion would be as follows; "The data shown in Figure 13 suggest that each..." Just delet the "the" before each.	Northern Water	Comment noted; corrected

Municipal Water Efficiency Plan Guidance Document				
Section:	4.3	Integrated Planning and Water Efficiency Benefits and Goals		
Page #	Sub-Section #	Comments	Author	Questions/Notes
34	4.3.1	The interpretation of the statute goes beyond the statute.	Lindsay Weber, Denver Water	Comment noted; the Statute requires that providers consider and disclose how water efficiency will be integrated with their water supply planning. The State does not place any stipulation on how water efficiency should be incorporated into future water supply planning efforts. This is at the discretion of the water provider.
34	4.3.1- footnote	To be more realistic, change the last sentence to "customer base is not interested in investing in certain water efficiency measures at this time. "	Lindsay Weber, Denver Water	Comment noted; change made.
36	4.3.1	clearly define what is meant by "type of home". Do you mean single family/multifamily or ranch/split level?	Lindsay Weber, Denver Water	Comment noted; type of home defined.
37	4.3.2	change "societal" to "social"	Lindsay Weber, Denver Water	Comment noted; no change made. Societal refers to society as a whole and the benefits that are related to the society as a whole, where social could mean a benefit related to getting people together around the idea of water efficiency in social setting.
38	4.3.2	could add another bullet on how saved water could be used - could be used as protection against system failures if the water is saved in the right place	Lindsay Weber, Denver Water	Comment noted; fully evaluated is statutory language-pg. 40-42 outlines the full evaluation process recommended by the CWCB. Language has been added to this section to clarify what fully evaluated means.
39	4.3.3	Remove the bullet "total estimated water savings relative to surrounding urban water providers," because this would lead to inappropriately comparing apples and oranges.	Lindsay Weber, Denver Water	Comment noted; change made.
39	4.3.3	for the line "indoor water savings" and "outdoor water savings", change the last columns to "estimates of residential indoor" and estimates of residential outdoor" to keep it consistent	Lindsay Weber, Denver Water	Comment noted; change made.
37	4.3.2	Change the first bullet point from "Lower customer water bills" to "Mitigate rate impacts"	Aurora Water	Comment noted; this applies to lower water bills for customers that use less water which can be a societal/economic benefit for the individual end user. Footnote was added to discuss the need for providers to mitigate potential rate impacts as a result in the reduction water use and revenues.
34	4.3.1	It would be helpful if the thought on page 34 about needing more monitoring or level of certainty in projected savings was changed to a more direct statement about the uses of conserved water as it relates to permanency.	Denver Water	Comment noted; the following sentence was added, "In other words, having the confidence of the permanency of the water efficiency savings can dictate whether or not more verification is needed to ensure there are sufficient savings available for postponing the timing of a new water treatment facility or using those savings for a drought reserve."
37	4.3.1	First sentence at top of page, plans does not need to be plural	Northern Water	Comment notes; correction made.
37	4.3.2	First bullet under second paragraph states "Lower customer water bills." Considering the issues caused by decreased water use and increase water rates in the early to mid 2000's, this may not be a claim that is always viable.	Northern Water	Comment noted; this applies to lower water bills for customers that use less water which can be a societal/economic benefit for the individual end user. Footnote was added to discuss the need for providers to mitigate potential rate impacts as a result in the reduction water use and revenues.

Municipal Water Efficiency Plan Guidance Document

Section: 4.4 Selection of Water Efficiency Activities

Page #	Sub-Section #	Comments	Author	Questions/Notes
41	4.4	more clearly define what is meant by "likelihood of success". What kind of success? Water savings? High participation?	Lindsay Weber, Denver Water	Comment noted; the Statute requires that providers consider and disclose how water efficiency will be integrated with their water supply planning. The State does not place any stipulation on how water efficiency should be incorporated into future water supply planning efforts. This is at the discretion of the water provider.
42	4.4 - box	as a percentage of what?	Lindsay Weber, Denver Water	Comment noted; statutory language cannot be changed through this guidance document process. CWCB interprets it as the % of total demand. Language was added to clarify this.
42	4.4	"water that will be saved" - don't like the "will be" since it is something uncertain in the future. Change "will be" to "will likely be"?	Lindsay Weber, Denver Water	Comment noted; statutory language cannot be changed through this guidance document process.
45	4.4.1	Change sentence to " Large multifamily units and raw water systems" since many apartment units are not individually metered	Lindsay Weber, Denver Water	Comment noted; change made.
45, 46, 48	4.4.1- boxes	"Fully evaluated" needs to be more clearly defined.	Lindsay Weber, Denver Water	Comment noted; fully evaluated is statutory language-pg. 40-42 outlines the full evaluation process recommended by the CWCB. Language has been added to this section to clarify what fully evaluated means.
48	4.4.1-box	State what specifically about water-efficient fixtures and appliances should be evaluated?	Lindsay Weber, Denver Water	Comment noted; this is an element that must be fully evaluated in terms of its viability to garner savings in relation to the water provider's specific water resources portfolio and system.
48	4.4.1-box	change "water efficiency techniques" to "water efficiency programs ". "Techniques" is the wrong noun.	Lindsay Weber, Denver Water	Statutory language cannot be changed through this guidance document process
50	4.4.1	change "customer behavior modifications" to "changes to customer water use practices"	Lindsay Weber, Denver Water	Comment noted; change made.
52	4.4.1	change the third bullet point to "are there any broad political/social obstacles to, or positive pushes for , adoption of".	Lindsay Weber, Denver Water	Comment noted; change made.
42	4.4	In the second paragraph, change "Section 4.1.1 to Section 4.4.1"	Aurora Water	Comment noted; change made.
n/a	4.4	It would be helpful for utilities if more detail was provided on what it means for programs to be "fully evaluated". Without further clarification, there can be many different interpretations on what "fully evaluated" entails and why a program can be eliminated from the selection process. It could be helpful to reference the Key Assessment Questions on pages 49-54 and the screening criteria on pages 41-42	Denver Water	Comment noted; language was added in Section 4.4 to clarify fully evaluated. The process for evaluation is provided in Section 4.4.

Municipal Water Efficiency Plan Guidance Document

Section: 4.5 Implementation and Monitoring Plan

Page #	Sub-Section #	Comments	Author	Questions/Notes
56	4.5.1	change the word "shortfall" to "decrease". Water efficiency may lead to a decrease in revenue, but utilities should be planning for that decrease so it doesn't necessarily have to result in a shortfall.	Lindsay Weber, Denver Water	Comment noted; agreed that it shouldn't result in a shortfall but even ten years after drought many utilities do not incorporate water efficiency savings into their revenue forecasts thus resulting in shortfalls. Language to the effect of "can lead to revenue shortfalls....if reductions are not accounted for in planning" was added.

Section: 5.0 PUBLIC STAKEHOLDER INVOLVEMENT

Page #	Sub-Section #	Comments	Author	Questions/Notes
63	5.1- 2nd bullet	Be more clear on what "assess this" means. For example - Their desire to change their landscape? Their landscape preferences?	Lindsay Weber, Denver Water	Comment noted; this addresses the perception of xeriscape vs. turf grass (preference). This would be up to the local water provider to define when/if they choose to do something like a survey. Footnote added to provide clarification.
63	5.1-last bullet	change "the City's effort" to "the provider's effort"	Lindsay Weber, Denver Water	Comment noted; change made.

Municipal Water Efficiency Plan Guidance Document

Section: 6.0 ORGANIZATION AND CONTENT – TEMPLATE FOR A WATER EFFICIENCY PLAN

Page #	Sub-Section #	Comments	Author	Questions/Notes
66	6.2	change "municipalities" to " water providers "	Lindsay Weber, Denver Water	Comment noted; change made.
66-67	6.2	More clarification is needed on how the designations are different from each other. For example, beneficial is recommended, but some beneficial data is required; and some essential designations have statute language in the descriptions.	Lindsay Weber, Denver Water	Comment noted; definitions are provided on pgs. 66-67; after looking through the template CWCB staff cannot find instances where beneficial recommendations are required; the statute language associated with some essential designations refers to HB 1051 and data collection that is required of covered entities annually. This illustrates the nexus between the two statutes.
69	1.1	Is having a bullet for wastewater treatment plants relevant? Water providers are not always the ones who do water treatment.	Lindsay Weber, Denver Water	Comment noted; this document is meant to provide guidance to the many types of water providers across Colorado and many water providers do provide wastewater services.
70	2.1	should the first box be "description of customer categories in the billing system"?	Lindsay Weber, Denver Water	Comment noted; additional text was added to state the customer types are often defined by customer categories in the billing system.
71	6th box	define more clearly what is meant by "water use patterns"	Lindsay Weber, Denver Water	Comment noted; language changed to "water use trends".
74	3.2	add 'class' to the middle bullet: "target water saving by customer class "	Lindsay Weber, Denver Water	Comment noted; change made.
76	4.2	worksheet H should be in blue text under Level 3, first box, first bullet:	Lindsay Weber, Denver Water	Comment noted; change made.
79	4.2.2	change "number of customers" to " estimated number of customers"	Lindsay Weber, Denver Water	Comment noted; change made.
80-81	level 1, 2,3	add a bullet under the first boxes stating "who or what agency has to approve the regulations?"	Lindsay Weber, Denver Water	Comment noted; change made.
82	5.1	add 'selected' to "discuss the actions, timeline and coordination necessary to implement the selected water efficiency activities."	Lindsay Weber, Denver Water	Comment noted; change made.
All	6.0	Suggest adding a HB1051 column to explicitly state the reporting requirements of HB1051. Currently, requirements are embedded into the other 5 categories.	Aurora Water	Comment noted; the HB 1051 requirements are called out in the template using the Statute number (in parentheses) rather than the house bill number.
81	4.2.4	As stated previously in the document in Section 4.2.3, it is very difficult to estimate water savings associated with Education activities. Therefore, it may be better to change this requirement to beneficial from essential, and allow providers to include education activity savings into savings from other activities, since education activities often support other water savings rather than providing savings themselves.	Aurora Water	Comment noted; the CWCB understands it can be difficult for some providers to estimate past water savings. This is acknowledged in the document. However, saving estimates are required per Statute. The CWCB has always been flexible with working with providers to come up with reasonable estimates for past water savings.

Municipal Water Efficiency Plan Guidance Document				
Section:	7.0	REFERENCES AND APPENDICES (Worksheets)		
Page #	Sub-Section #	Comments	Author	Questions/Notes
A	A	it is extremely difficult to assign water savings to specific programs like education and audits.	Lindsay Weber, Denver Water	Comment noted; the CWCB understands it can be difficult for some providers to estimate past water savings. This is acknowledged in the document. However, saving estimates are required per Statute. The CWCB has always been flexible with working with providers to come up with reasonable estimates for past water savings.
b	b	more definition and clarity is needed around the words: frequent, substantial, high, substantial, anticipated, need, and issues. For example, one person's idea of 'frequent' could be completely different from another.	Lindsay Weber, Denver Water	Comment notes; these terms have been used in other studies such as SWSI. This is a qualitative subjective assessment.
b	b	regarding "aging infrastructure": isn't all infrastructure aging?	Lindsay Weber, Denver Water	Comment noted; added additional clarification to say "aging infrastructure in need of repair"
c	footnote [3]	change "allow downsized" to "downsized"	Lindsay Weber, Denver Water	Commented noted; change made
c	footnote [3]	change "conservation" to "water efficiency"	Lindsay Weber, Denver Water	Commented noted; change made
d	d	the line on "irrigated lands in service area" needs more clarity. What specifically about irrigated lands?	Lindsay Weber, Denver Water	Comment noted; clarification added.
d	d	change "volume billing" to "volumetric billing"	Lindsay Weber, Denver Water	Commented noted; change made
d	d	spell out what "IRP" stands for	Lindsay Weber, Denver Water	Comment notes; change made.
d	d	"goal setting and monitoring" needs some clarification or criteria. What type of goals?	Lindsay Weber, Denver Water	Comment noted, this was deleted.
e	e	"Faucet Retrofit" should be changed to "faucet aerator installation"	Lindsay Weber, Denver Water	Comment noted; faucet aerator installation was added.
e	e	more definition and clarity is needed for the line "efficient irrigation"	Lindsay Weber, Denver Water	Comment noted; efficient irrigation was deleted.
e	e	move "efficient swamp cooler and AC use" to the "Installation of water efficient fixtures" section above	Lindsay Weber, Denver Water	Comment noted; change made.
e	e	change "faucet rebates" to "faucet aerator rebates"	Lindsay Weber, Denver Water	Comment noted; this applies to the replacement of older faucets with newer more water efficient faucets. Aerator rebates were also added.
d-h	d-h	there should be criteria set up for the reasons why programs were eliminated	Lindsay Weber, Denver Water	Comment noted; while a provider is required by Statute to demonstrate that specific conservation activities have been evaluated, the Statute does not require a specific criteria for why certain activities were eliminated. These criteria/reasons are at the discretion of the water provider. The worksheets provide a means to record such criteria/reasons.
k	k	the nonresidential per capita water use line should be deleted. There is no population for these groups to make it 'per capita'. Also it doesn't provide any information about efficiency.	Lindsay Weber, Denver Water	Comment noted; changed to unit water use (e.g. AF/account or AF/irrigated acre)
k	k	The line "irrigated landscape" needs more detail. Does it mean the water used to irrigate landscape? The square feet of irrigated landscape in the service area?	Lindsay Weber, Denver Water	Comment noted, example provided.
A.1	First paragraph	Add a disclaimer sentence that these worksheets are entirely optional, and are only intended to guide providers through the process of developing a WEP.	Aurora Water	Comment noted; this is included in the main document and the Template uses language such as "X worksheet may be used." The introduction to the worksheets in Appendix A also states that the worksheets may be used at the discretion of the water provider.
Worksheet L	Footnotes	Footnote [3] is missing	Aurora Water	Comment noted; the footnote 3 is not missing.