Initial Draft

No/Low Regrets Action Plan – Conservation

Prepared for June 5, 2013 IBCC Meeting

Low/Medium Conservation Strategies

Conservation is a major piece of the larger water supply portfolio and will be an important tool for meeting future municipal and industrial (M&I) demands. As such, conservation is a critical component in reducing agricultural water transfers while maintaining robust environmental and recreational values. The portfolios developed by the IBCC and basin roundtables indicated a desire to reach low to medium conservation levels statewide, regardless of what future scenario may arise. However, when it came to the amount of conserved water that could be applied to the projected 2050 water supply gap, the portfolios reflected a wide range of possibilities: 0% to 60%.

The Colorado Water Conservation Board defines water conservation as those methods and programs that enable measurable and verifiable permanent water savings (CWCB, 2010). The conservation strategy outlined in the State Water Supply Initiative (SWSI) seeks to periodically update the range of potential future water conservation savings to meet a projected 2050 M&I water supply gap. While trajectories of water providers' conservation savings may currently appear on the path to achieve the medium conservation levels described in SWSI 2010, without active support, medium levels will most likely not be achieved.

Additionally:

- The nearly 20% demand reduction attained statewide since the early 2000s may not be fully maintained.
- New data from a nationwide study of residential end use (which includes Denver Water) indicates that the passive conservation levels predicted in SWSI 2010 are not being realized at the anticipated pace and therefore more active support is needed.
- Local or statewide ordinances/legislation needed to achieve medium or high conservation levels are not being widely adopted and require additional support.
- Furthermore, it is not clear how much, if any, of the potential water savings from active conservation could be incorporated into reducing base demands (i.e., a portion of the M&I gap). Significant concerns remain about the reliability of future conservation savings and the ability to share these savings at the right time and location to meet additional municipal demands.

Nonetheless, based on basin roundtable portfolio work, discussion at the Statewide Conservation "mini-summit," work of the IBCC Conservation Subcommittee, and other discussions, it has been determined that implementing the action items associated with medium conservation should be a no/low regrets strategy. The potential future actions described below should help make conservation savings a more reliable part of the solution to meeting Colorado's future water needs.

Completed and Ongoing Actions	Potential Future Actions

• Collect HB 1051 Data
• Implement Executive Order for State agencies to develop water and energy conservation plans
• Support CWCB Conservation Program and state-approved water provider conservation plans
• Created and distributed Metro Roundtable Conservation
• Established IBCC Conservation Subcommittee
• Support Water Conservation Technical Advisory Group (WCTAG)
• Implement CWCB Conservation Planning Program & Technical Support, including:
  • SWSI Conservation Levels Analysis
  • SWSI M&I Water Conservation Strategies
  • Guidebook of Best Practices for Municipal Water Conservation in CO
  • Municipal Water Efficiency Plan Guidance Document and Sample Plan
• Held joint roundtable meetings and a statewide roundtable conservation mini-summit in 2012
• Encourage and target communities at current low levels of conservation with funding
	1) Improve Tracking, Quantification, and Reliability
	  a) Implement HB 1051
	  b) Develop Basin Implementation Plans
	  c) Maintain and develop storage and other infrastructure
	2) Establish a Statewide Conservation Goal with Intermittent Benchmarks
	  a) Develop general political support for a statewide conservation goal
	  b) Develop statewide agreement tying conservation to new supply development and agricultural transfers
	  c) Encourage local entities to outline and report their own approaches to help achieve the statewide goal
	  d) Explore best approach to implementation of standards to achieve goal
	  e) Develop and implement conservation standards
	3) Continue to Support Local Implementation of Best Practices
	  a) Continue implementation of state conservation programs
	  b) Encourage use of levels framework and best practices guidebook
	4) Develop Enhanced Incentives for Conservation
	  a) Explore funding options in support of the Water Efficiency Grant Program
	  b) Develop professional education and certification programs
	  c) Develop new eligibility requirements for state grants and loans that include certain conservation levels or indications of commitment to conservation
	  d) Develop regulatory incentives
	  e) Support and encourage land use practices that help reduce water consumption
	5) Explore Legislative Concepts and Develop Support
	  a) Explore legislative options and support for indoor plumbing code standards
	  b) Explore legislative options and support for outdoor water efficiency standards
	  c) Engage in outreach and education efforts to explain the need for legislation; develop political support
	6) Implement Education and Outreach Efforts
	  a) Track public attitudes through baseline and ongoing surveys
	  b) Develop statewide messaging and use focus groups to refine and guide implementation
	  c) Develop decision-maker outreach strategies
	  d) Pursue a coordinated media campaign

1. Improve Tracking, Quantification, and Reliability

Potential Future Action Purpose(s)

The basin roundtable portfolios exhibit large variation in the amount of conserved water that is expected to be available for application to the projected 2050 water supply gap. The predicted amount ranges from zero percent from low conservation strategies to sixty percent from high conservation strategies. There was general agreement among portfolios that the strategies that support medium conservation should be implemented in order to reduce impacts to agriculture and nonconsumptive needs. However, several basin roundtables and water providers are deeply concerned about the reliability of using conserved water to sustainably meet a portion of the gap. Much of the water conservation savings achieved over the last decade rely on the behaviors of customers, and water providers are concerned that new people moving to Colorado may not exhibit similar conservation behaviors. In addition, many of the rapidly growing areas that need additional water supplies do not have a lot of conservation potential but could use conserved water from other water providers. Unfortunately, there are several constraints to sharing conserved water. For instance, many water rights do not allow a water provider to share conserved water beyond its service area, and there is lack of infrastructure to move conserved water where and when it is needed. For these reasons, tracking how and if conservation savings are able to be realized and continue to reduce water demands is critical. In addition, efforts to help increase the reliability of conservation savings may also be critical.

These future efforts will seek to refine our knowledge of concrete conservation savings that can meet current and future supply needs. A summary of SWSI conservation findings are provided in Appendix A, which describes the estimates of potential future water conservation for three distinct strategies—low, medium, and high water conservation savings.

Potential Specific Actions

a) **Implement HB 1051:** Implementing the water conservation data collection efforts required by HB 1051 will allow for ongoing quantification of program effectiveness and reliability. HB 1051 requires covered entities – those water providers who deliver 2,000 acre-feet (af) or more per year – to participate by providing data. CWCB should also encourage non-covered entities, particularly those that are likely to reach the 2,000 af threshold by 2050, to voluntarily participate. This data will be used as part of SWSI to track conservation savings and how much can be used to meet municipal and industrial needs.

b) **Develop Basin Implementation Plans:** Ongoing development of the basin roundtable Implementation Plans and updates to SWSI will include updated conservation data in the analysis. Roundtables should quantify what in-basin conservation actions will be used to meet future municipal and industrial needs.

c) **Maintain and develop storage and other infrastructure:** Maintenance and the development of adequate storage and other infrastructure will be necessary for ongoing reliability of conservation savings so that conserved water can be utilized when and where it is needed (see Storage No/Low Regrets Action Plan). This task should be done through the Basin Implementation Plans.

Immediate Action Steps

Potential Measurable Outcomes

Timeframe

Partners

Background

Challenges/Barriers

Collection of data through HB 1051 and the Basin Implementation Plans will be long term and iterative. It may take a number of years to gain insight as to the reliability of water conservation practices using the data collected through the HB 1051 process.

Opportunities

Through tracking and quantification, the reliability of water conservation practices can be verified over time and water conservation's role for meeting the M&I supply gap can be better defined.

2. Establish a Statewide Conservation Goal with Intermittent Benchmarks

Potential Future Action Purpose(s)

By decreasing the amount of water that is needed to meet M&I needs, conservation can reduce the amount of water that is transferred out of agriculture and help retain water in Colorado's streams for environmental and recreational needs. Conservation also reduces the amount of additional water resources needed to meet future M&I demand, thereby reducing the water supply "gap." The majority of conservation efforts occur at the local level, but some additional work is needed statewide to maximize momentum toward conservation. Creating a statewide conservation goal can unite the entire state in a common effort that invites, encourages, and/or requires action at the individual, family, community, provider, and even basin levels. It distributes the responsibility for conservation equally across the state but also allows for personal choice and local autonomy in how to participate in the achievement of the goal. Intermittent benchmarks will help individuals, providers, basins, and the state as whole understand if we are doing enough separately and together to meet our growing demand while also protecting our agricultural heritage and nonconsumptive values.

Potential Specific Actions

a) **Develop general political support for a statewide conservation goal:** Work with basin roundtables, the IBCC, water providers, the Governor, and other thought leaders to increase understanding of the importance of a shared vision and goal for the state and a statewide ethic of water conservation (e.g., "we are all in the same boat"). Messaging should stress how conservation can help slow down agricultural dry-up, meet the water supply gap, and protect nonconsumptive needs.

b) **Develop statewide agreement tying conservation to new supply development and agricultural transfers:** Through the IBCC and in consultation with the basin roundtables and other stakeholders as needed, develop a statewide agreement that links minimum conservation levels to the development of new supply and the conversion of agricultural water to municipal use (e.g., "if, then" statements indicating commitments from Front Range water providers to increase conservation before building new transmountain diversions and commitments from West Slope and agricultural leaders to support or remain neutral on new supply projects if certain conservation thresholds are met).

c) **Encourage local entities to outline and report their own approaches to help achieve the statewide goal:** As part of the Basin Implementation Plan effort, providers should be encouraged to define and pursue an approach to their participation in the achievement of the statewide conservation goal. Providers should work with the IBCC, basin roundtables, and CWCB to outline how they will increase conservation in their own systems and how they will measure success in this effort.

d) **Explore the best approach to implementation of standards to achieve goal:** Through research on approaches used in other states and/or on other issues within Colorado, assess whether standards will be more successful (both politically and in terms of water conserved) if implemented through local approaches, an agreement signed by water providers, statewide approaches, legislation, support from the Governor, an Executive Order from the Governor, municipal code, incentives, etc. Initial consideration by the IBCC Conservation Subcommittee suggests that if the standard is voluntary, perhaps adopted through a legislative resolution or by the CWCB and IBCC, then it would need to be paired with incentives. If it is determined that the best approach is a legislative mandate, then this should likely only be applied to covered entities.

e) **Develop and implement conservation standards, such as:**
- **Best practices standard:** Standards based on which water conservation best practices have been implemented by the local utility/community (e.g., tiered rates, metering, and leak detection for all water providers, and a higher level for covered entities). By definition, these could be adapted to meet local needs.
- **Water use standard:** Statewide water use standard could be regionalized (e.g., residential gallons per capita per day, size and number of water taps, localized evapotranspiration rates).
- **Percent reduction standard**: Percent reduction in per capita demands and associated target date. This could allow for local decisions on which best practices to implement.
- **New water project standards:** The CWCB and IBCC could establish standards for proponents of new projects to implement conservation measures to at least the medium level in order to gain IBCC support.

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Background

Challenges/Barriers

Public misperceptions about water conservation efforts directly increasing water rates may lead to some resistance to conservation. The public may believe that as water savings are achieved by the customer, the water provider will increase water rates so that conservation does not result in a cost savings to the customer.

Opportunities

The ability to conserve water can be one of the most easily implemented strategies as well as an extremely effective overall water management strategy for water providers.

3. Continue to Support Local Implementation of Best Practices

Potential Future Action Purpose(s)

Local implementation of conservation best practices allows communities, providers, and basins to identify and execute appropriate, nuanced mechanisms for achieving water conservation goals. Taken together, local implementation of conservation best practices will reduce Colorado's projected M&I water supply gap, lessen the need for agricultural dry-up, and protect the state's rivers and streams. The purpose of this section is to describe how state efforts can continue to support local entities through application of its tools and resources.

Potential Specific Actions

a) **Continue implementation of state conservation programs:** Continued implementation of state conservation programs include:

- **Conservation plan review and approval:** Continue reviewing and approving locally adopted water conservation plans in order to encourage long-term water conservation planning and quantification of water savings, and to ensure that water providers document their water conservation goals.
- **Water Efficiency Grant Fund:** Utilize the Water Efficiency Grant Fund to ensure the implementation of water conservation best practices and to assist water providers with targeting their resources as efficiently as possible.
- **Targeting of communities with strategic conservation potential:** Focus on opportunities for water conservation planning in areas where a number of small water providers can create a regional water conservation plan or where there is a community that will approach 2,000 af of use by 2050. This should especially be the case when conservation in such communities could help reduce the municipal and industrial water supply gap or lessen the need for agricultural dry-up or impacting nonconsumptive values.

b) **Encourage use of levels framework and best practices guidebook:** Encourage water providers to use the Water Conservation Levels Analysis framework developed by the CWCB to move beyond the foundational base levels of conservation by providing a clear prioritization of future local conservation efforts. This framework can be used as a guide for which conservation best practices are appropriate, considering the goals of a water provider's conservation program. The levels framework establishes increasing levels of conservation efforts by water providers, including technical support, education, and local ordinances.

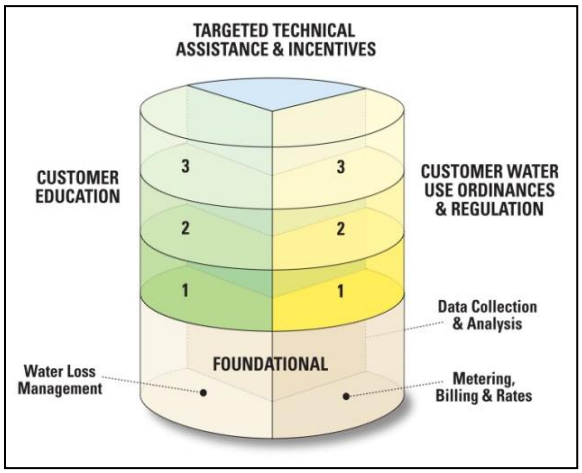

Figure 1. CWCB Conservation Levels Framework

Water loss management and metering, billing, and rates (including water budgets) are examples of foundational water conservation best practices.

Water loss control is the practice of system auditing, loss tracking, infrastructure maintenance, leak detection, and leak repair for water utilities. Water loss control is a major emerging issue due to extensive aging infrastructure throughout the state. Similar to HB 1051, there should be further consideration of legislation that would require entities above a certain size to report their audit data of their distribution system water loss.

Conservation-oriented rates, tap fees, or water budgets can be implemented, along with customer categorization within the billing system and full metering. Numerous studies have shown that conservation-oriented rates and tap fees are effectively reduce water demands.

There are numerous other examples of best practices, and many of these are discussed in appendix A below.

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4. Develop Enhanced Incentives for Conservation

Potential Future Action Purpose(s)

Enhanced incentives to encourage water conservation could prove to be an effective and universally accepted strategy if properly structured. Current incentive programs, such as the Water Efficiency Grant Program, could be modified, and new programs could be created. Incentives for water conservation may include funding, regulatory benefits, or other methods. Incentives may have a link to various legislative concepts in the following section, as noted.

Potential Specific Actions

a) **Explore funding options in support of the Water Efficiency Grant Program:** Expand and target funds in support of the Water Efficiency Grant Program to create more incentives for water conservation.
   - **Target Funding:** Funding could be targeted at communities with strategic conservation potential, as described above (under "Continue implementation of state conservation programs")
   - **Acquire additional Funding:** Other grant/loan programs could be modified or created to supplement the Water Efficiency Grant Program. For instance, CWCB's loan program could be modified to allow loans for improvements to water provider distribution systems to minimize water loss. Additional funding could also be added to the grant program.

b) **Develop professional education and certification programs:** Landscape professionals and plumbers could be required to receive training and certification in water conservation practices and technologies.

c) **Develop new eligibility requirements for state grants and loans that include certain conservation levels or indications of commitment to conservation:** CWCB could develop new rules for state grants and loans that require providers seeking financial assistance to demonstrate a minimum level of conservation and/or a plan to increase conservation (i.e., by fixing leaks, implementing tiered pricing, educating customers, etc.)

d) **Develop regulatory incentives that incorporate the following concepts:**
- **Base level of conservation:** A base level of conservation could be required for all water providers, regardless of size or location.
- **Assess issues, benefits, and drawbacks of the current definition of "covered entities":** Consider increasing levels of conservation beyond that base level for "covered entities." The 2,000 af level could be applied to those communities expected to grow into a 2,000 af water system by 2050, even if they are smaller than that now.
- **Water markets:** Potential water right adjustments to allow structured markets to better share conserved water (consumptive use) regionally without adverse water rights implications if certain conservation standards are met.
- **Small community support:** Additional funding, training, or other support from the state and/or larger water providers could help support and advance water conservation in smaller communities, particularly on the West Slope.
- **Permitting incentives**. Water providers that meet a certain threshold of conservation savings or best practices implementation could be offered state support and/or the facilitation of certain permitting approvals.

e) **Support and encourage land use practices that help reduce water consumption:** In 2010 CWCB produced a report entitled *Colorado Review: Water Management and Land Use Planning Integration.* Several local actions which could be used more broadly stemmed out of that report. These include:
- **Expedited permitting:** Permitting for buildings and developments could be expedited if the project incorporates certain water efficiency measures or high levels of density.
- **Tax incentives:** There could be tax breaks if the project incorporates certain water efficiency measures or high levels density.
- **Structure impact (tap) fees:** Use impact fees to promote water-wise developments and in-fill. These fees could be structured to penalize water inefficient or sprawling developments and/or to reward sustainable/dense developments.
- **Regional collaborative planning:** Localized solutions are often not effective, since water demand may be transferred from one jurisdiction to one or many others. Therefore, regional solutions are critical and should be further explored. Some opportunities exist, such as engaging Council of Governments in water/land use discussions, identification of related regional planning efforts that are underway and including water issues, and the use of intergovernmental agreements.
- **Integration:** Many other efforts are currently underway that could reduce regional water demand, but are not specifically aimed at achieving that purpose. There are many

opportunities for developing partnerships with other water conservation efforts, sustainable/walkable neighborhood developments, energy conservation and CO_2 reduction programs, water quality programs, food security programs, transportation projects, market drivers, comprehensive plans, and many others.

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5. Explore Legislative Concepts and Develop Support

Potential Future Action Purpose(s)

Conservation is considered an important part of meeting our future water supplies statewide. However, most water providers do not believe that medium or high levels of conservation can be achieved without statewide legislation. Without such legislation, there will continue to be concerns regarding the reliability of conservation and how much can be applied to meet future water needs. While most of the large Front Range water providers agree that statewide legislation is needed, and the "Letter to the Governors" in 2010 also suggested such language, some stakeholders are skeptical that state legislation can be flexible enough to meet local operational needs. The large Front Range water providers have argued that many of their conservation efforts are approaching the maximum amount of conservation possible. In order to achieve the next levels of conservation, state support, perhaps in the form of legislation, will be needed to apply significant amounts of conservation to meet future municipal and industrial needs. Without such statewide support, there could be customer and voter backlash and communities may compete even more for development and growth opportunities, since one community could keep new housing costs down by not adopting a local ordinance.

The purpose of this section is to explore legislation that does not force individual water providers to increase their funding of conservation initiatives or conduct a specific conservation practice, but to allow for broad-based solutions that are largely supported by the plumbing, landscaping, and retail communities.

Potential Specific Actions

a) **Explore legislative options and support for indoor plumbing code standards**
   - The state should adopt and require water efficiency standards that meet or exceed WaterSense for indoor building codes for all new construction and renovation,
   - These standards could be strengthened and/or geared to new construction,

b) **Explore legislative options and support for outdoor water efficiency standards**
   - The state should adopt and require water efficiency standards that meet or exceed WaterSense for outdoor use for all new construction and major landscape renovations,

- These standards could be strengthened and/or geared to new construction,

c) **Engage in outreach and education efforts to explain the need for legislation; develop political support**
   - Consult with IBCC, basin roundtables, and CWCB regarding legislation; include messaging components from education and outreach efforts (see Potential Future Action #6)
   - If there is support from IBCC, basin roundtables, and CWCB, consult with other stakeholders (providers, Colorado Municipal League, Colorado Counties, Inc., Club 20, Green Industries of Colorado, etc.)
   - Draft language for legislation or model ordinance language for further consideration and consultation with stakeholders
   - If there is statewide support and success seems likely, proceed accordingly – find a sponsor, garner support, etc.

Immediate Action Steps

Potential Measurable Outcomes

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- Any legislation should allow lead time for implementation and should be built on dialogue and consensus before moving forward.

Partners

Background

Challenges/Barriers

Opportunities

6. Implement Education and Outreach Efforts

Potential Future Action Purpose(s)

Education is critical to conservation, since many of the savings require behavior changes. If legislation is required to implement water conservation measures, a significant education initiative will be needed.

Potential Specific Actions

a) **Track public attitudes through baseline and ongoing surveys:**
   - Forthcoming results from the state's value of water survey, the communications roadmap document, and other efforts will be used to inform conservation outreach, policy, and educational efforts.
   - Resurvey the public in the future with consistent questions to gauge understanding and support for water conservation in Colorado.

b) **Develop statewide messaging and use focus groups to refine and guide implementation:** Encourage a culture of water conservation similar to the ethic of recycling that currently exists through local education. This could also be accomplished by initiating statewide education and messaging about water conservation with a simple unified message. Since Colorado residents will be the ones who implement conservation, the message must reach

them. While there are several options for how to do this, one approach could be to develop tools to support conservation and water education. This could include coordination with the WaterWise Council's current effort on creating a value of water toolbox for provider or regional outreach efforts. The Value of Water survey suggests that regional groups are the most trusted source by the public.

c) **Develop decision-maker outreach strategies:**
   - **Water provider summit:** A water provider summit could be developed where water providers with sophisticated water conservation programs can help interested water providers further improve their programs.
   - **PEPO decision-maker outreach strategy:** The Public Education, Participation, and Outreach (PEPO) workgroup of the IBCC has developed a strategy that supports roundtable efforts to reach out to decision makers in their communities and engage in additional statewide outreach efforts.
   - **Coordinated outreach efforts to help local jurisdictions adopt ordinances and/or conservation best practices:** Determine which communities could use assistance and work with them to explore solutions that will work for them.
   - **CWCB statewide water efficiency workshops:** CWCB will conduct statewide water efficiency workshops in Fall 2013 and Spring 2014, centered around the CWCB Conservation Planning and Technical Support Program (SWSI Levels Framework, Best Practice Guidebook and the Municipal Water Efficiency Plan Guidance Document and Sample Plan).

d) **Pursue a coordinated media campaign (either statewide or by individual utilities):** Entities throughout the state (including CWCB, providers on both sides of the Divide, and nongovernmental organizations) could work together to implement a coordinated media campaign that seeks to develop a statewide water conservation ethic similar to past efforts to develop a common recycling ethic.

Immediate Action Steps

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Appendix A: Summary of SWSI Findings on Water Conservation

Conservation Strategies: Implementation Rates and Savings Levels

Table 1 presents a comparison of the low, medium, and high conservation strategies. Savings and measures for each water use sector are presented and the key demand reduction modeling assumptions for each sector are shown in **bold blue** font. The conservation strategy measures that apply to each sector are listed as bullet points beneath each demand reduction assumption. Table 1 includes the implementation/penetration levels and ranges that are assumed to be achieved by 2050 to accomplish the demand reductions.

Table 1 - Comparison of 2050 Implementation and Penetration Level for Three Conservation Strategies and Demand Reductions Used in Forecasts

Measure	Implementation or Penetration Level by 2050		
	Low Strategy	Medium Strategy	High Strategy
Systemwide conservation measures with potential to impact all customers			
Public information and education	~100%	~100%	~100%
Integrated resources planning	~100%	~100%	~100%
Conservation-oriented water rates	~100%	~100%	~100%
Water budget-based water rates	<=10% of utilities implement	<=30% of utilities implement	<=50% of utilities implement
Conservation-oriented tap fees	0 - 5% of utilities implement	5 - 10% of utilities implement	<=50% of utilities implement
Smart metering with leak detection	<=10% of pop.	<=50% of pop.	50 - 100% of pop.
Residential indoor savings and measures			
Reduction in Residential Per Capita Indoor Use	**Res. Indoor gpcd = 40**	**Res. Indoor gpcd = 35**	**Res. Indoor gpcd = 30**
Conservation-oriented plumbing and building codes, green building, rules for new residential construction	30-50% of state impacted	50-70% of state impacted	70-100% of state impacted
High efficiency toilets, clothes washers, faucets, and commercial, industrial, and institutional equipment	Passive ~100%	Passive ~100%	Passive ~100%
Submetering of new multi-family housing	0%	~50%	~100%
Reduction in customer side leakage	33% savings - passive from toilet replacement	37% savings - passive from toilet replacement and active repairs	43% savings - passive from toilet replacement and active repairs
Non-residential indoor savings and measures			
Reduction in Non-Residential Per Capita Indoor Use	**15% reduction**	**25% reduction**	**30% reduction**
High efficiency toilets, urinals, clothes washers, faucets, and showers	Passive ~100%	Passive ~100%	Passive ~100%
Conservation-oriented plumbing and building codes, green building, rules for new non-residential construction	30-50% of state impacted	50-70% of state impacted	70-100% of state impacted
Specialized non-residential surveys, audits, and equipment efficiency improvements	0-10% of utilities implement	10-50% of utilities implement	50-80% of utilities implement
Landscape conservation savings and measures[1]			
Landscape water use restrictions (residential and non-residential)	**15% reduction**	**22-25% reduction**	**27-35% reduction**
Targeted audits for high demand landscape customers	0-30% of utilities implement	30-50% of utilities implement	50-80% of utilities implement
Landscape transformation of some high water requirement turf to low water requirement plantings	<=20% of landscapes	20-40% of landscapes	>50% of landscapes

Table 1 - Comparison of 2050 Implementation and Penetration Level for Three Conservation Strategies and Demand Reductions Used in Forecasts

Measure	Implementation or Penetration Level by 2050		
	Low Strategy	Medium Strategy	High Strategy
Irrigation efficiency improvements	<=10% of landscapes	<=50% of landscapes	50-100% of landscapes
Utility Water Loss Control			
Improved utility water loss control measures	**<=7% real losses**	**<=6% real losses**	**<=6% real losses**

[1] Landscape water demand reductions include the anticipated impact of urban densification.

Water Savings in 2050 Under Three Conservation Strategies

The total estimated water savings that may be achieved through implementation of the three conservation strategies are presented in Table 2. In Table 2 the water savings from each SWSI 2010 strategy builds upon the previous strategy starting with the passive savings.

Table 2 - Statewide Forecast Water Savings Potential from SWSI 1, SWSI 2, and SWSI 2010[1]

Project	Level	2030 Forecast Savings[2] (AFY)	2050 Forecast Savings[2] (AFY)
SWSI 1	Level 1 (Passive)	101,900	NA
	Level 2	170,533	
	Level 3	272,852	
	Level 4	443,385	
	Level 5	699,183	
SWSI 2	Low	287,000	NA
	Mid	372,000	
	High	459,000	
SWSI 2010	Passive[3]	131,000	154,000
	Low	209,000	314,200
	Medium	264,000	485,200
	High	328,100	615,300

Notes:

[1] Total water savings potential included, which does not decipher the portion of the savings that may be available to meet future demands versus other planning uses such as drought reserve. In addition, this analysis does not address issues such as the spatial, temporal, and legal availability of the potential savings.

[2] Volumes savings estimates are total cumulative and include passive savings (e.g., SWSI 1, Level 3 savings build upon Levels 1 and 2; SWSI 2010, medium savings build upon low savings).

[3] From SWSI levels analysis (CWCB 2010).

The SWSI levels analysis of statewide passive water conservation potential showed that by 2050, demands will likely be reduced by about 150,000 AFY through the natural replacement of toilets, clothes washers, and other standard domestic fixtures (CWCB 2010). In Table 2, these passive savings are embedded in all three conservation strategies. The SWSI 2010 conservation strategies add savings from active conservation program efforts to the passive savings estimates.

If successfully implemented to the levels described, in 2050, the low strategy plus passive savings results in estimated statewide water savings of 314,200 AFY. In 2050, the medium strategy plus passive savings results in estimated statewide water savings of 485,200 AFY and the high strategy plus passive savings results in estimated statewide water savings of 615,300 AFY.

In Table 3, the passive and active water savings estimates are presented separately to help ensure double counting of water savings does not occur in the future as these estimates are used.

Table 3 - Statewide Forecast Water Savings (Separating Passive and Active) Potential from SWSI 1 and SWSI 2010[1]

Project	Level	2030 Forecast Savings[2] (AFY)	2050 Forecast Savings[2] (AFY)
SWSI 1	Level 1 (Passive)	101,900	NA
	Level 2 (active only)	68,633	
	Level 3 (active only)	170,952	
	Level 4 (active only)	341,485	
	Level 5 (active only)	597,283	
SWSI 2010	Passive[3]	131,000	154,000
	Low (active only)	78,000	160,200
	Medium (active only)	133,000	331,200
	High (active only)	197,100	461,300

Notes:

[1] Total water savings potential included, which does not decipher the portion of the savings that may be available to meet demands associated with new population versus other planning uses such as drought reserve. In addition, this analysis does not address issues such as the spatial, temporal, and legal availability of the potential savings.

[2] Volumes savings estimates are total cumulative and include passive savings (e.g., SWSI 1, Level 3 savings build upon Levels 1 and 2; SWSI 2010, Medium savings build upon Low savings).

[3] From SWSI Levels analysis (CWCB 2010).

Assumptions and Limitations

There are important caveats and assumptions regarding the water conservation strategies that should be understood so that the results are not misinterpreted or misapplied.

Conditional Statewide Strategies to Assess Conservation Potential – These three strategies were used to prepare a conditional demand forecast. The savings estimates presented are expected to be achieved if the programs and measures described are implemented at the specified level across the entire state. The medium and high strategies in particular will require a significant and sustained effort in order to achieve the forecast water savings. The forecasting assumptions do not reflect differences that exist between individual water providers. Each water provider in Colorado is distinct and it is anticipated that over the next 40 years water conservation will be implemented differentially across the state. In order to prepare statewide forecasts of conservation potential it was assumed that the potential to conserve water may exist irrespective of an individual water provider's need or desire to conserve. In reality, some providers will need little if any conservation savings to meet future demands while others will seek substantial demand reductions.

Permanency of Existing Conservation Efforts – The water savings projections in this report are conditioned on post-drought baseline demands, and assume water conservation savings since the 2002 drought period will be sustained into the future. The permanency of post-drought related reductions in water use is uncertain. Some of this uncertainty may be resolved as additional water utility-level data are obtained and further investigated. Additional and improved data is anticipated through future utility water conservation plans and under data reporting requirements established in Colorado House Bill (HB) 10-1051.

Climate Change Not Considered – The impacts of climate change on water demands were not included in this analysis. Time and budgetary limitation did not allow for this complexity to be included. Climate change is an important factor for consideration in conjunction with future water demands and should be included in subsequent forecasting efforts.

The Future is Uncertain and Water Use May Change – It is impossible to predict all of the technological and cultural changes that could occur over the next 40 years, which might impact water use. The trends over the past 15 years have been towards greater efficiency and lower use and at this moment in time, there is no indication that these trends will not continue (Coomes et al. 2010). However, it is possible that new uses for water could emerge in the future, which might increase municipal demand (e.g., increased use of evaporative cooling, increased installation rates of swimming pools, spas, and/or multi-headed showering systems). Unanticipated demand increases could counteract some of the savings estimated in this report, even if conservation programs are implemented at the specified levels. Similarly, technology could also serve to reduce future water demands below those estimated here. Updating the baseline condition and demand forecasts regularly is the best way to incorporate unanticipated future changes.

Uses of Conserved Water Are Not Assumed – No assumptions have been made about the portion of the water savings forecast in this report that could potentially be utilized toward water supply, serving new customers, or meeting the M&I gap. Each water provider must decide how best to apply water garnered from demand reductions within their individual water supply portfolio. Utilities will need to make these decisions based on their integrated water resources planning efforts, consideration of their system's reliability throughout drought periods, impacts of conservation on their return flows and availability of reusable supplies, effectiveness of water rates and impacts to their revenue streams, and other local considerations. Subsequent efforts will be needed to help determine what portion of active conservation savings can be applied to the M&I gap.

Impacts from New Construction – A substantial number of new homes and businesses will be constructed throughout the state between now and 2050. The projections provided for this basin-level planning effort do not distinguish between savings that will be achieved from existing versus new construction. Actual savings may be attributed more to higher efficiency new construction in portions of the State, particularly where more dense development occurs.

Influences on Water Use

Estimated demand reductions relate to three basic processes or influences on water use:

- Passive saving reductions related to the natural replacement of customer water using fixtures and appliances;
- Other changes in water use behaviors (e.g., state legislation, changes in land use, drought impacts, etc.); and
- Active water conservation program impacts related to implementation of water conservation programs sponsored by water utilities and special districts.

Noteworthy is that current water demand is trending downward due to a combination of these three influences. Similarly, future demand reductions will require that water utilities, NGOs, water customers, and state and local officials work together to support and ensure that meaningful, permanent water conservation programs are developed and implemented.

This shared responsibility for future water conservation does not dismiss the important role of water utilities to act as good stewards of the State's water resources. But the work of managing water in Colorado is not solely the responsibility of our water utilities. It requires the cooperation and collaboration between all members of the water community. (**Source:** Metro Roundtable Conservation Strategy.)