

Opportunities for Water Conservation

*Realizing the Streamflow Benefits from
Local Water Conservation Efforts*



Roaring Fork Conservancy



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Executive Summary

Realizing the Streamflow Benefits of Local Water Conservation Efforts

The research and recommendations presented in this report arose from the desire among local interests in the Roaring Fork Watershed to understand how water conservation efforts could be used to improve local streamflows. The report – completed by Roaring Fork Conservancy with funding from Garfield County and the Pitkin County Healthy Rivers and Streams Fund – has its origins in a commonly heard local question: “Why hasn’t Roaring Fork Conservancy engaged in a water conservation campaign to improve streamflows?” Generally, the reason has been because in Colorado water conservation raises a host of complicated legal issues, such as abandonment, waste, and potential injury to other water users. Yet such legal barriers do not change the fact that conservation efforts are likely to prove essential to ensuring adequate streamflows in the Roaring Fork Watershed.

Wanting to understand more about the questions, concerns, limitations, and potential strategies to water conservation, Roaring Fork Conservancy obtained funding to examine what a water conservation campaign might entail. The objective of this study was to assess the range of potential strategies for employing water conservation as a means to benefit streamflows, and to make recommendations about how local interests in the Roaring Fork Watershed should proceed accordingly. While some of the proposed strategies remain legally untested, by pursuing these various approaches through a coordinated conservation campaign, local interests can prove that they are serious about responsibly using and managing local water resources and help to secure sufficient streamflows for the Roaring Fork Watershed.

Colorado water law potentially allows for conservation efforts to be conducted in a manner that directly benefits streamflows. Only the Colorado Water Conservation Board (“CWCB”) has the authority to make beneficial use of water, without a diversion, for the purpose of maintaining flows in a specific stream reach in order to preserve and improve the natural environment. The CWCB can acquire senior water rights or interests in water rights for instream flow (“ISF”) purposes through a variety of contractual arrangements, which may require going through water court to formally change or add to the decreed type and place of use of the water right. Although the CWCB has never accepted an ISF acquisition that was premised on the original user’s active water conservation efforts, as long as the proposed change is executed in accordance with the legal restrictions imposed in any change decree, such efforts could conceivably be used to make senior water rights, or a portion thereof, available for contracting to the CWCB’s Instream Flow Program.

In terms of the amount of water potentially transferable to ISF use, the CWCB often claims credit for both the historical diversions and historical consumptive use attributed to an absolute water right. A reduction in current or foregoing diversions over historical rates can be used for ISF purposes in the stream reach between the original point of diversion and historical point of return flows. A similar reduction in consumptive use can be used for ISF purposes downstream from the original point of return flows. Therefore, conservation efforts that reduce the current or foregoing use of a water right in relation to either historical consumptive use or historical diversions could potentially serve as the basis for an ISF acquisition (*see* Table 1, following page).

Table 2 (following page) identifies the three principal limitations to this concept, the most of important of which is that a proposed change in the use of a water right will not be permitted to the extent it would injure other absolute and conditional water rights. One commonly identified issue with water conservation is the



Table 1. The two general strategies for reducing the historical beneficial use of a water right through conservation efforts in order to allow the right to be used for ISF purposes by the CWCB.

Water Conservation Strategy	ISF Transaction Amount (Unit)	ISF Reach Benefited	Types of Conservation Measures
Reduce Current Consumptive Use	Reduction in current consumptive use over historical beneficial consumptive use (acre-feet)	Historical point of return flows to downstream terminus	Reduction in irrigated acreage (agricultural or landscape); deficit irrigation practices
Reduce Current Diversions	Reduction in current diversions over historic beneficial diversions (cubic feet per second)	Decreed point of diversion to historical point of return flows	Efficiency measures (e.g., low-flow appliances, conversion from flood to sprinkler irrigation)

possibility that reduced use of a water right might raise claims of abandonment; however, recent legislation has largely precluded such claims in the context of water conservation efforts and ISF acquisitions.

There are nonetheless two lingering legal concerns with the proposed strategy: (1) the period of reduced use prior to applying for a change decree may be factored into the historical beneficial use attributed to the water right proposed for change; and (2) the potential for opponents to argue that water conservation “savings” represent water that was previously “wasted”. To avoid for first problem, conservation efforts should be designed to prevent a prolonged period of reduced use prior to filing a change decree for an alternative use of the right in question. With respect to the issue of waste, whether an appropriator’s practices meet the required legal standard for beneficial use (i.e., “reasonable efficiency”) is a question of fact gauged according to prevailing local customs and practices. While appropriators should necessarily curtail any wasteful water use that occurs under their water rights, such reductions must be distinguished from reductions of otherwise reasonable water use that can potentially be transferred to other beneficial uses, including to the CWCB for ISF purposes.

While the concept of employing conservation efforts as a means to make water rights available for the CWCB’s Instream Flow Program is novel, such initiatives could be a valuable means of ensuring adequate streamflows in the Roaring Fork Watershed. In particular, opportunities exist for local agricultural water users to reduce their current beneficial consumptive use through selective irrigation and crop management (e.g., rotational fallowing, deficit irrigation practices, planting of drought resistant crop/ grass varieties), so that the resulting historical consumptive use credits can be contracted to the CWCB for ISF use. And the existence in the valley of several large municipal and agricultural water diversions that remove water from long and environmentally significant stream segments suggests that conservation measures targeting historical diversions could also make water available for ISF use.

Based on these conclusions, Roaring Fork Conservancy and its partners should consider the following recommendations for legal, policy, fundraising and other activities as the foundation for a comprehensive water conservation campaign in the Roaring Fork Watershed:

1. If the threat of low streamflows in 2012 requires, launch a public campaign to solicit agricultural water users who are willing to temporarily cease

Table 2. Principal limitations on a legal decree to change the existing use of a water right, including for ISF purposes.

Limitation	Excluded from/Prohibited by Change Decree
No-Injury Rule	<ul style="list-style-type: none"> Expanded use of the water right in terms of either timing or amount diverted and consumed “Carriage loss” in mutually owned ditch system Alteration of historical pattern of return flows
Historical Beneficial Use	<ul style="list-style-type: none"> Non-decreed use, not otherwise permitted by law Illegal, out-of-priority diversions (i.e., subject to stream call) Wasteful water use (i.e., not reasonably necessary for the decreed beneficial use)
Claims of Abandonment	<ul style="list-style-type: none"> Any portion of a water right for which the owner has intended to permanently discontinue using

irrigation and loan their water rights to the CWCB's Instream Flow Program, in order to prevent local streams with existing minimum ISF rights from running dry. Support legal and engineering analysis required for the State Engineer's approval of such temporary loans. Similarly support long-term or permanent ISF acquisitions, if and when willing water users come forward.

2. Investigate the feasibility of local water conservation efforts based on rotational fallowing, selective crop management, and deficit irrigation practices that make historical consumptive use credits available for contracting to the CWCB for ISF purposes. Pursue financial support for such a program from the CWCB's Alternative Agricultural Transfer Methods Grant Program, and solicit technical support from Colorado State University. Support engineering analysis to quantify the resulting reduction in relation to historical beneficial use and legal work to transfer the conserved water to the CWCB Instream Flow Program.
3. Investigate the feasibility of a pilot water conservation project for a local municipal water provider based on the widespread adoption of weather-based landscape irrigation controllers. Pursue financial assistance for such a project from the Bureau of Reclamation's WaterSMART Water and Energy Efficiency Grant program, if and when funding becomes available. Assist in preparing the legal and engineering analysis required to support a change decree for ISF use based upon this concept.
4. Investigate the engineering feasibility of a local water user strategically reducing their current or foregoing diversions through conservation measures, and in coordination with the CWCB, using the remaining water for ISF purposes between the original point of diversion and point of return flows. Assist in preparing the legal and engineering analysis required to support a change decree for ISF use based upon this concept.
5. Meet with state representatives from the valley to discuss the use of conservation measures as a means to make water available for ISF use. Explore potential legislative avenues for addressing the lingering legal concerns surrounding the use of water conservation as a means to make water available for ISF purposes (as discussed in section 4).
6. Encourage and assist local municipal water providers to develop comprehensive water supply, drought mitigation, and water conservations plans pursuant to state law, in order that they may benefit from the recent legal protections against claims of abandonment provided by the General Assembly (Senate Bill 05-133).
7. Encourage the Colorado River Water Conservation District and the local water conservancy districts (Basalt and West Divide) to develop water conservation certification programs, so that private water users can take advantage of the legal protections against claims of abandonment afforded by Senate Bill 05-133.
8. Develop a "Conserve-to-Enhance" type of program (*see* section 6.1) for one or more municipal water providers in the watershed, and encourage its funds to be allocated initially to improving local stream flow gauges, with specific stream channel restoration and enhancement projects as a secondary use of available funds.

9. Consider establishing a watershed-wide public educational campaign on landscape irrigation efficiency, working through Colorado State University Extension network. Advocate for the CSU Extension offices in Eagle, Garfield, and Gunnison counties to coordinate and administer such a program, and encourage Pitkin County to reestablish an Extension office with a water conservation program focusing on landscape irrigation and small acreage management. Promote the existing CSU Extension programs of Master Gardeners and Native Plant Masters as a means to disseminate information on low-water demand landscaping and irrigation efficiency.

10. Continue to promote a watershed-wide scope to local water conservation efforts. Connect water conservation efforts in the valley to statewide water management planning efforts, specifically the Interbasin Compact process created under the Colorado Water for the 21st Century Act (2005). Consider potential funding for local water conservation efforts from the Colorado's Water Supply Reserve Account and the Bureau of Reclamation's WaterSMART Cooperative Watershed Management Program (second or third phases in FY 2013), if and when funding becomes available.

1. Introduction

Now is an opportune time for local water users in the Roaring Fork Valley to consider water conservation strategies that could help ensure adequate streamflows in the watershed. For the past four years, “dozens of agencies, governments and interests throughout the Roaring Fork Valley and beyond” have been collaborating on the development of a general management plan for the water resources of the Roaring Fork Watershed, the final report of which was recently completed.¹ One of the principal goals identified in the Roaring Fork Watershed Plan is to “ensure that solutions to water management issues meet both our consumptive needs for water and the need to keep water in our rivers and streams for instream uses.”² Accordingly, the plan recommends that local stakeholders “investigate if water conservation translates to environmental benefits under Colorado water law,” and “implement the most strategic water conservation measures.”³

Based on that directive, this report discusses the legal options currently available to water users in Colorado for employing water conservation as a means to benefit local streamflows, and then makes recommendations for a strategic water conservation campaign in the Roaring Fork Watershed. Colorado water law potentially allows for conservation efforts to be conducted in a manner that directly benefits local streamflows. As the Roaring Fork Watershed Plan anticipates, such initiatives could be a valuable approach to ensuring adequate streamflows in the valley.

2. Realizing the Streamflow Benefits of Local Water Conservation Efforts

2.1 CWCB's Instream Flow Program

The Colorado Water Conservation Board (“CWCB”) has the exclusive authority to appropriate or acquire water, without a diversion, for the beneficial purpose of maintaining instream flows (“ISF”) in a specific stream reach in order to preserve and improve the natural environment.⁴ Since 1973, the CWCB has been authorized to make new appropriations in natural streams and lakes of the minimum amount of water necessary to preserve the environment to a reasonable degree.⁵ Given the relative junior status of water rights decreed since 1973, the CWCB’s appropriated minimum ISF rights are susceptible to going unmet, particularly during times of drought. In order to avoid such shortages, the General Assembly has also authorized the CWCB to acquire absolute water rights historically used for other beneficial purposes and transfer them to ISF use.⁶ Such transactions can be structured through either temporary loans or permanent/long-term agreements.⁷

The CWCB can accept temporary loans of absolute water rights in order to satisfy existing ISF water rights with only the State Engineer’s approval, subject to several conditions.⁸ Such loans are restricted to 120 days in any calendar year and three years during a single ten-year period.⁹ The State Engineer will not approve a subsequent ten-year loan agreement unless the original agreement was never exercised.¹⁰ Temporary loans can only be used to satisfy existing ISF water rights and only up to the decreed ISF amount.¹¹ Due to these restrictions, temporary loans are useful for responding to severe drought conditions, when streams are threatened with running dry, but they do not provide lasting streamflow protection.

For permanent or long-term arrangements, the CWCB may also acquire absolute water rights, or interests in absolute water rights, “by grant, purchase, donation, bequest, devise, lease, exchange, or other contractual agreement,” as long as the right in question is not on the division engineer’s abandonment list.¹² The change in the type and place of use of a water right, including for ISF use, generally must be decreed in water court.¹³ Importantly, in contrast to the CWCB’s authority to make new appropriations and accept short-term loans, under a 2002 law (Senate Bill 02-156) the CWCB can contract for senior water rights in order to “preserve or improve the natural environment to a reasonable degree.”¹⁴ The CWCB can use this authority to maintain instream flows above the minimum amount of water required to preserve the environment.¹⁵ This authority could be especially useful for providing the kinds of periodic “flushing” and “flooding” flows that help maintain natural stream channel characteristics and high-quality riparian habitat (see Figure 1).¹⁶

In deciding whether to agree to a permanent or long-term ISF acquisition, the CWCB must consider, among other factors, whether the natural environment “will be preserved or improved to a reasonable degree by the water available from the proposed acquisition.”¹⁷ The CWCB is required to consult with Colorado Division of Parks and Wildlife for their biological opinion on this matter.¹⁸ The CWCB must also confirm with the State Engineer’s Office that the proposed acquisition is administrable.¹⁹ Other important factors the CWCB must consider are the potential effect of the proposed acquisition on Colorado’s ability to comply with interstate river compacts and to make the maximum utilization of the state’s water resources.²⁰ Despite these conditions, permanent or long-term water rights acquisitions by the CWCB have proven a valuable means of ensuring adequate instream flows, particularly in the Roaring Fork Watershed where several such transactions have already been completed.²¹

Although the CWCB has never accepted an ISF acquisition that was premised on the original user’s active water conservation efforts, as long as the proposed change is executed in accordance with the legal restrictions imposed in any change decree, such efforts could conceivably be used to make senior water rights, or a portion thereof, available for contracting to the CWCB’s Instream Flow Program.

2.2 Quantifying Water Rights for ISF Acquisitions

For permanent or long-term ISF acquisitions, the CWCB is generally required to obtain a legal change decree in state water court before it can use an existing water right for ISF purposes.²² In a change decree proceeding, an absolute water right is measured according to the actual historical beneficial use credited to the right, not the amount originally decreed to the right.²³ The difference between the current or proposed use of the water right and its historical beneficial use is the amount that is potentially available to transfer in such a proceeding.²⁴ Unless the issue of historical beneficial use was recently adjudicated in a similar case, the applicant for a change decree must produce a record of historical beneficial diversions and consumptive use of



Figure 1. Spring “flushing” and “flooding” flows, like these June 2011 near-peak flows on the Crystal River, maintain and create channel shape and riparian habitat, recharge groundwater levels, flush excess sediments from the river bottom, and redistribute nutrients to the riparian environment. Instream and riparian biota are highly adapted to and dependent upon such flows. (Peter Driscoll)

the water right to be changed, from which the court will recognize specific values based upon a representative period of years.²⁵ There are two ways to measure the historical beneficial use of a water right for change decree purposes: historical consumptive use and historical diversions.

In seeking a change decree for ISF use of an absolute water right, the CWCB often claims credit for both the historical diversions and historical consumptive use attributed to the right.²⁶ A reduction in current or foregoing diversions over historical rates can be used for ISF purposes in the stream reach between the original point of diversion and point of return flows. A similar reduction in consumptive use can be used for ISF purposes downstream from the original point of return flows.²⁷ Therefore, conservation efforts that reduce the current or foregoing use of a water right in relation to either historical consumptive use or historical diversions could potentially serve as the basis for an ISF acquisition.

2.2.1 Historical Consumptive Use

Typically the amount of historical beneficial use that will be credited to a water right in a change decree proceeding is measured in acre-feet, representing the amount of water that was historically “consumed” under the right.²⁸ Consumptive use occurs when water is permanently removed from the stream system through beneficial use.²⁹ For example, when water is used for irrigation, a portion of the water is consumed via evaporation and transpiration as the plant performs photosynthesis, with the remaining water generally returning to the local stream system through subsurface groundwater and surface wastewater flows (see Figure 2).³⁰ To the extent an applicant for a change decree can demonstrate a current or foregoing reduction in historical consumptive use, a water court will recognize “historical consumptive use credits” (“HCU credits”) that are potentially available to transfer to other beneficial uses, including ISF use. The subsequent use of the HCU credits will be governed by the historical pattern of return flows under the original use, which must be maintained in time, place, and quantity.³¹

ISF use is generally a nonconsumptive use of water, except to the extent of “transit loss” (i.e., evaporation from the stream surface or evapotranspiration by native vegetation). Accordingly, pursuant to House Bill 08-1280, when an appropriator transfers HCU credits to the CWCB’s Instream Flow Program, the

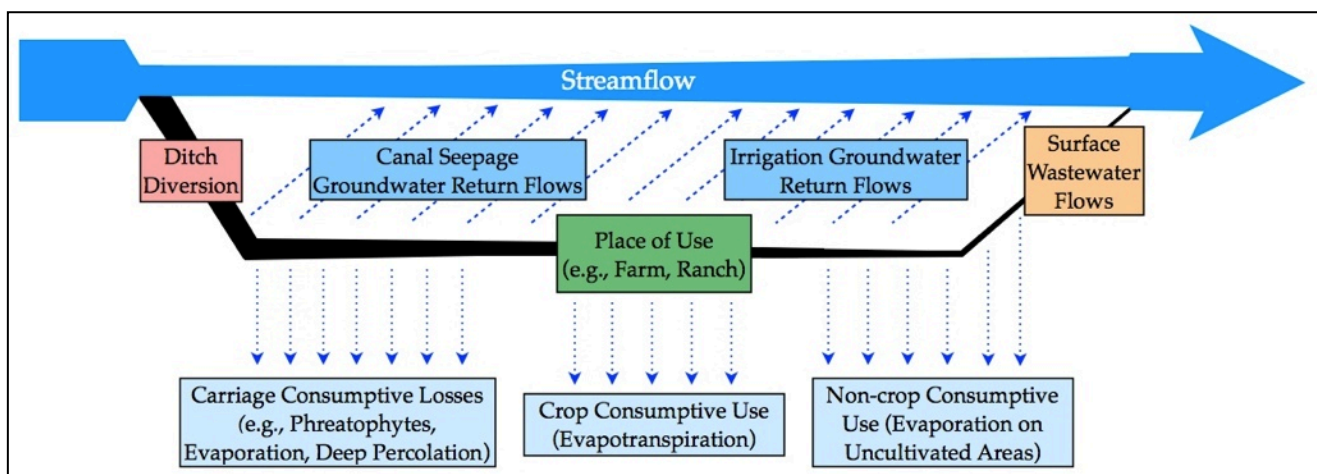


Figure 2. Irrigation diversions are comprised of groundwater return flows, consumptive use, and surface wastewater flows.



Figure 3. Weather-based landscape irrigation controllers, like this SmartLine system from Weathermatic, vary watering according to current weather conditions, location, sprinkler type, soil type, and plant type.

HCU credits can be used first for ISF purposes and then, downstream of the benefited stream reach, for other beneficial purposes as “fully consumable reusable water.”³²

Irrigation is responsible for the majority of consumptive water use in Colorado and the Roaring Fork Watershed.³³ Compared to the five to ten percent rate of consumption typical of indoor water use, irrigation consumes approximately 30 to 90 percent of the total amount of water diverted, depending on the particular type of irrigation system and other factors.³⁴ Therefore conservation efforts intended to benefit local streamflows by reducing water consumption should focus on irrigation first and foremost, without ignoring the potential for municipal and industrial conservation efforts to also generate transferable HCU credits.

Adequately proving a verifiable reduction in consumptive use is one challenge to generating transferable HCU credits for a change decree proceeding. In the agricultural context, the simplest means is to reduce the amount of irrigated acreage. Change decrees are frequently based on the

“dry up” of formerly irrigated lands, even though such transfers, when accomplished on a large scale, can have significant environmental and socioeconomic impacts on the surrounding area.³⁵

While the concept remains legally untested, recent research has also demonstrated the technical feasibility of “deficit irrigation,” which attempts to minimize the amount of water required for an established irrigation scheme. For example, studies have shown that weather-based irrigation controllers can reduce the water demand of municipal landscaping by 20 percent or more (see Figure 3).³⁶ Likewise, recent research by Colorado State University showed that partial season irrigation can reduce the consumptive use associated with growing perennial hay crops, the dominant crop type in the Roaring Fork Valley.³⁷ Water conservation efforts intended to benefit local streamflows therefore are not necessarily confined to drying up former agricultural lands or replacing bluegrass lawns with xeriscaping.

2.2.2 Historical Diversions

Although consumptive use is the traditional measure of the historical beneficial use attributed to a water right, another way also exists, which is particularly relevant in the context of water conservation efforts.³⁸ Change decrees for municipal or augmentation use often allow a water user to divert the full historical diversion amount, so long as historical return flows are maintained in time, place and quantity.³⁹ Similarly, in certain circumstances, the historical diversion rate attributed to a water right can be applied to ISF use between the original point of diversion and point of return flows, again, so long as historical return flows are maintained in time, place, and quantity (see Figure 4).⁴⁰



Figure 4. In Case No. 10CW184, CWCB and Pitkin County applied to use a water right originally decreed to the Stapleton Ditch for ISF use in Maroon Creek and the Roaring Fork River. The CWCB is seeking ISF use of the right based on the historical diversions (white and orange segments) and the historical consumptive use attributed to the right (red segment). (Pitkin Co.)

Such an approach to quantifying absolute water rights for change decree purposes is potentially relevant to water conservation efforts because it means that efficiency measures that reduce a water user's current or foregoing diversions to below historical rates could, in theory, allow the user to contract a portion of their water rights to the CWCB for ISF use between the original point of diversion and point of return flows. For example, retrofitting homes with low-flow indoor water fixtures, replacing flood irrigation with sprinkler or drip irrigation systems, or simply reengineering or relocating headgates, all of which have little effect on the overall rate of consumptive use but which can reduce a water user's diversions, could be used to benefit flows in the stream reach between the water right's decreed point of diversion and historical point of return flows.

Although the CWCB has never accepted an ISF acquisition that was based solely on a reduction in diversions, it does appear legally feasible for a water user to strategically reduce their current and foregoing diversions to below historical levels and subsequently contract the remaining water to the CWCB for ISF use between the original point of diversion and point of return flows. As this strategy has not yet been tested in water court, a water rights owner should use caution and will need to seek legal and technical advice before embarking on such an undertaking. Nevertheless, for some water users this could be a valuable means of directly benefiting local streamflows through their water conservation efforts.

3. Limitations on Change Decree Applications

Any change in the type, place, or time of use of a water right, or a change in the point of diversion, must be adjudicated in water court in order to provide an opportunity for other appropriators to object to the proposed change.⁴¹ An application for a change decree can be challenged on multiple grounds, which are potentially relevant to water conservation efforts.

3.1 Non-decreed Use & Illegal, Out-of-Priority Diversions – Excluded from Historical Beneficial Use

In calculating the historical beneficial use to be credited to a water right for change decree purposes, a water court will only consider the lawful, beneficial use of the right pursuant to original decree or as otherwise permitted by law. The non-decreed use of a water right, in terms of either the timing and place of diversion or the type and place of beneficial use, will be excluded from the historical beneficial use credited to a water right, unless the use was otherwise permitted by law (e.g., short-term ISF loans to the CWCB, as approved by the State Engineer).⁴² Likewise, out-of-priority diversions that are contrary to an order of the State Engineer's Office will be excluded from the historical beneficial use credited to a water right.⁴³ Accordingly, to pursue an ISF acquisition, an appropriator must be capable of documenting the lawful use of the water right in question.

3.2 The "No-Injury" Rule – Principal Limitation on Change Decree Applications

Outside of proving historical beneficial use, the principal limitation in any application for change decree is that the use of an existing water right cannot be changed in any manner that will injure other decreed water rights.⁴⁴ All water rights owners, regardless of the relative priority of their rights, have a vested interest in the continuation of stream conditions as they existed at the time of their respective appropriations.⁴⁵ A proposed

change in the decreed use of a water right will not be permitted to the extent it would diminish the amount of water historically available to other water rights.⁴⁶

There are a number of ways a proposed change decree can reduce the amount of water historically available to other water rights. The most direct way other appropriators can be injured is if the proposed change would expand the historical use of the right, in terms of the total amount of water either diverted or consumed.⁴⁷ Accordingly, any ISF acquisition must be structured to ensure absolute parity in the total amount of water diverted and consumptively used before and after the change of use of the subject water rights.

Other appropriators may also be injured if the proposed change would expand the historical use of the water right in terms of the timing of diversions and consumptive use.⁴⁸ For example, water rights historically used for irrigation during the summer growing season could not be used by CWCB to maintain instream flows during the winter. Rather, the CWCB's ISF use of a water right will likely need to be restricted to times when the water right was both historically in priority and in operation.⁴⁹

Another type of injury can occur if the proposed change involves a water right that was historically diverted through a mutually owned ditch system.⁵⁰ In such a case, the transfer of the water right to another point of diversion or place of use may decrease the ditch's overall carrying capacity. To prevent such an injury, a small portion of the water right may need to remain in the ditch, in order to allow other appropriators on the ditch to continue to receive their full share of water.⁵¹

Similarly, a proposed change in the use of an existing water right will not be permitted if it would alter the historical pattern of return flows that other appropriators depend upon to satisfy their own decrees.⁵² The right of water users to the continuation of the stream conditions as they existed at the time of their respective appropriations includes the established pattern of return flows attributed to other water rights.⁵³ These return flows essentially constitute tributary water that has been released from the original appropriator's domain and is thereafter available for use by other appropriators.

In some cases, return flows associated with a water right make water available to appropriators who would otherwise not have access to the water absent the original diversion, yet such return flows must nevertheless be maintained.⁵⁴ For example, if return flows accrue to a different stream from the original water source, and other appropriators depend on those flows to satisfy their own water rights, then the historical pattern of return flows cannot be altered through a change decree proceeding.⁵⁵ Likewise if return flows are delayed, the altered timing of the runoff may make water available to other appropriators who otherwise would not have access to the water.⁵⁶

This rule is well demonstrated by the water collection system of the Snowmass Water and Sanitation District ("SWSD"). SWSD's water supply primarily comes from East Snowmass and Snowmass creeks, through a series of pipelines and pumps that convey water over the small divide separating the Snowmass Creek and Brush Creek drainages.⁵⁷ After municipal use within SWSD's service area, the resulting return flows augment natural stream levels in lower Brush Creek and the Roaring Fork River between the river's confluences with Brush Creek and Snowmass Creek (see Figure 5, following page).⁵⁸ To the extent that other appropriators depend on these return flows in order to satisfy their own decreed water rights, SWSD could be prevented from legally changing its diversions from East Snowmass and Snowmass creeks. Thus, any attempt by SWSD to transfer a portion of its water rights for ISF use in the Snowmass Creek drainage would likely have to be fashioned in a manner that does not alter the return flows to lower Brush Creek and the upper Roaring Fork River upon which other appropriators have historically relied on to satisfy their own water rights (i.e., at the



Figure 5. East Snowmass and Snowmass creeks are the primary sources of water for the Snowmass Water & Sanitation District's water collection system, due to the impaired water quality and limited physical supplies in the Brush Creek drainage. Return flows from the district's transbasin diversions are discharged and released into lower Brush Creek, where they eventually rejoin the source waters at the confluence of Snowmass Creek and the Roaring Fork River. (USGS, adapted from W.W. Wheeler, 2006)

time of their respective appropriation of water).

In addition to transbasin municipal diversions, other water users commonly depend on the return flow patterns associated with irrigation water use, particularly from large, mutually owned ditch systems that transport water considerable distances. Large ditch systems that irrigate upland areas are relatively common in the Roaring Fork Watershed and frequently generate return flows that other appropriators rely upon.⁵⁹

In summary, although conservation efforts can be implemented in such a manner as to allow a portion of the underlying water rights to be contracted to the CWCB's Instream Flow Program, the requisite change decree must be tailored to ensure that the water historically available to other appropriators will not be reduced. The water court will have to be satisfied that the proposed ISF acquisition will not expand the historical use of the water right in question, neither in terms of the timing nor the overall amount of water diverted and consumed. Any carriage loss to a mutually owned ditch system will also need to be prevented. Likewise, a water right cannot be legally changed in a manner that will deprive other appropriators of the historical pattern of return flows they require to satisfy their own rights. These issues are highly fact-specific determinations that must be considered on a case-by-case basis, which is one reason for the complexity and length of many change decree proceedings.

Although the no-injury rule represents a substantial limitation on changing the decreed use of a water right, the issue can often be resolved by including specific terms and conditions in the change decree that will prevent injury to other water users.⁶⁰ Accordingly, conservation efforts intended to benefit local streamflows may be constrained but are not likely to be entirely precluded by the no-injury rule.

3.3 Claims of Abandonment – Largely Precluded by Recent State Legislation

A change decree proceeding is also an appropriate venue for other water interests to raise claims of abandonment of the water right proposed for change.⁶¹ A water right or a portion of a right can be lost to abandonment if the owner forms the "intent ... to discontinue permanently the use of all or part of the water available" under the right.⁶² Active water conservation efforts, particularly those intended to benefit local streamflows, necessarily raise the question whether the owner has elected to permanently forego use of the conserved water. However, the General Assembly has recently amended the statutory definition of abandonment several times in order to minimize the potential risk associated with water conservation efforts and ISF acquisitions.

Enacted by the General Assembly in 2005, Senate Bill 05-133 protects the owners of water rights from claims of abandonment for the nonuse of a water right due to several common types of water conservation efforts (*see inset*).⁶³ In particular, no intent to abandon a water right will arise from nonuse due to participation in a water conservation program either approved by a state agency, water conservation district or water conservancy district, or established by



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C.R.S. § 37-92-103(2): "... no intent to discontinue permanent use shall be found for purposes of determining abandonment of a water right for the duration that:

- (b) The nonuse of a water right is a result of participation in:
 - (I) A water conservation program approved by a state agency, a water conservation district, or a water conservancy district;
 - (II) A water conservation program established through formal written action or ordinance by a municipality or its municipal water supplier;
 - (III) An approved land following program as provided by law in order to conserve water; or
 - (IV) A water banking program as provided by law.

a municipality or its municipal water supplier through formal written action or ordinance.⁶⁴ Likewise, participation in “an approved land fallowing program as provided by law in order to conserve water” will not give rise to a presumption of abandonment.⁶⁵

State-level approval of a water conservation program occurs through the CWCB’s Office of Water Conservation and Drought Planning, pursuant to the Water Conservation Act of 1991.⁶⁶ Only water providers that deliver 2,000 acre-feet of water or more annually on a retail basis are subject to the Act’s requirements to develop, adopt, and implement a water conservation plan that encourages efficiency by the provider’s customers.⁶⁷ However, following a 2007 law (Senate Bill 07-008), any state or local governmental entity, regardless of their total water demand, may now also seek CWCB-approval of water conservation plans pursuant to the act, thereby benefiting from the legal protections against abandonment provided by Senate Bill 05-133.⁶⁸ The law also made these entities eligible for state funding for the development and implementation of water conservation plans pursuant to the Water Conservation Act of 1991.⁶⁹

With regard to water conservation programs approved by a water conservation or water conservancy district, neither the Colorado River Water Conservation District nor the two water conservancy districts within the Roaring Fork Watershed (Basalt and West Divide) currently operate any kind of program to approve individual water conservation plans. None of these entities are specifically authorized by statute to operate such a water conservation certification program, although such authority can likely be inferred from their respective enabling acts.⁷⁰

As for “an approved land fallowing program as provided by law in order to conserve water,” there are a number of legal means for a water court or the State Engineer’s Office to approve the temporary fallowing of agricultural lands when water supplies are limited. For example, farmers can make short-term loans (limited to 180 days in any calendar year) to other agricultural water users with only the division engineer’s approval.⁷¹ On a more permanent basis, water courts are authorized to award change decrees implementing “rotational crop management contracts,” which allow the owners of the water rights to rotate fallowed lands on a year-to-year basis.⁷² If implemented for the purpose of making water available to other uses, including for ISF use by the CWCB, the water rights involved in these types of fallowing programs would also be protected from abandonment pursuant to Senate Bill 05-133.

In addition to conservation efforts, the General Assembly has also created protections against claims of abandonment arising from ISF acquisitions. Under 2007 and 2008 laws (House Bills 07-1012 and 08-1280), no intent to abandon a water right will be inferred for any period of nonuse arising from the CWCB’s use of the right for ISF purposes.⁷³

Yet even without the specific statutory protections afforded by Senate Bill 05-133 and House Bills 07-1012 and 08-1280, an appropriator engaging in water conservation efforts can still avoid claims of abandonment simply by having a formal plan in place for an alternative beneficial use for their water rights prior to making any conservation reductions. Not only would such a plan obviate the intent required for abandonment, but it would also prevent any prolonged period of nonuse that might give rise to a presumption of abandonment.⁷⁴ Therefore, active water conservation efforts intended to benefit local streamflows may be insulated from claims of abandonment either by taking advantage of the legal protections afforded by Senate Bill 05-133 and House Bills 07-1012 and 08-1280, or by simply ensuring the continuous beneficial use of the water rights in question.

4. Lingering Legal & Practical Concerns

4.1 Diminishment Concerns – Reduction in the Historical Beneficial Use Credited to a Water Right

Though the General Assembly alleviated the risk of abandonment associated with several common types of water conservation programs, current state law does not adequately protect an appropriator from the possibility that conservation efforts could result in a reduction of the amount of historical beneficial use attributed to their water right for change decree purposes.

Any nonuse of a water right will be tolled and can potentially be factored into the amount of historical beneficial use credited to the right during a change decree proceeding.⁷⁵ The General Assembly has provided statutory protections against the diminishment when an appropriator transfers his or her water rights to the CWCB for ISF purposes; however, currently no such safeguards exist for water conservation efforts when conducted alone or prior to a decree implementing an ISF acquisition.

As long as a water right is in full continuous use, whether for its original purpose or for another decreed use, there is no concern about diminishment. But if an appropriator, through conservation efforts, reduces their current use of a water right to below historical levels and subsequently attempts to transfer the unused portion of the water right to another beneficial use, the water court may account for the reduced use when calculating the historical beneficial use credited to the right. The actual impact on the historical beneficial use would depend upon the length of a record of beneficial use prior to water conservation efforts, the amount of the reduction achieved through such efforts, and the length of time of reduced use prior to applying for a change decree. The shorter the record of historical beneficial use prior to conservation efforts, the larger the reduction, and the longer the period of reduced use would all magnify the potential threat of diminishment.

As the CWCB's use of a water right for ISF purposes is a nonconsumptive use of water, a longstanding concern was that an ISF acquisition might reduce the historical consumptive use credited to a water right.⁷⁶ However, in House Bill 08-1280, the General Assembly required that a change decree implementing an ISF acquisition be fashioned so as to ensure that the historical consumptive use credited to the right will not be lowered during the term of the ISF acquisition, except to the extent such a reduction is the result of the actual amount of water naturally available under the rights.⁷⁷ Additionally, the law requires the CWCB to properly measure and maintain records of the amount of water it uses pursuant to an ISF acquisition, which would presumably prevent any reduction in the historical diversions attributed to a water right.⁷⁸ Accordingly, there is no threat of diminishment of a water right once the decreed and actual use has been changed to ISF use.

But an appropriator who intends to benefit local streamflows through water conservation efforts is not likely to know if, when, and to what extent those efforts will produce a measurable decrease in the current or foregoing use of a water right in comparison to historical levels. If such is the case, the appropriator will not be able to apply for a change decree prior to engaging in water conservation efforts, thereby benefiting from the protections against diminishment provided by House Bill 08-1280. Therefore, the possibility of diminishment is a legitimate concern for water users who engage in conservation efforts prior to a decree to put the conserved water to an alternative beneficial use, such as ISF purposes. To minimize this risk, water conservation efforts intended to benefit local streamflows should be designed to prevent a prolonged period of reduced use prior to obtaining a change decree for ISF use of the corresponding water rights. Water users intending to engage in this

kind of water conservation campaign should also first seek the opinion of a qualified engineer as to how the amount of historical beneficial use attributed to their water rights may be affected.

4.2 Allegations of Waste – Implicated by Water Conservation Efforts

The basic objective of water conservation potentially implicates the issue of waste because conservation efforts that successfully reduce an appropriator’s water use to below historical levels raise the question of whether the appropriator was possibly “wasting” water to begin with. In any change decree proceeding an appropriator will only be credited for the actual beneficial use historically accomplished under the subject right.⁷⁹ Any historical use that a water court deems non-beneficial will be excluded from the calculation of historical beneficial use.⁸⁰

Colorado law does not specifically define wasteful water use, but rather requires that the term be gauged according to the standard of “beneficial use” – i.e., any diversion of water “not necessary for application to a beneficial use” is considered wasteful.⁸¹ Beneficial use is defined by law as “that amount of water that is reasonable and appropriate under reasonably efficient practices to accomplish without waste the purpose for which the appropriation is lawfully made.”⁸²

Under judicial precedent, the standard of “reasonably efficient practices” applies to all aspects of an appropriation, including the diversion of the water from the tributary stream or groundwater source, conveyance to the place of use, and application to beneficial use.⁸³ Whether an appropriator’s practices meet the standard of reasonable efficiency is gauged according to prevailing local customs and practices.⁸⁴ From the existing case law, it is evident that courts will also take into account economic factors and the financial feasibility of efficiency improvements in considering whether a particular means of diversion, conveyance and use qualifies as reasonably efficient.⁸⁵ Accordingly, what is reasonably efficient in one context may be wasteful in another. For example, although pipelines are generally considered a reasonable means of conveying municipal water, uncovered, earthen canals are still acceptable for irrigation purposes, despite the seepage, evaporation, and non-beneficial consumptive use they permit (*see* Figure 6).

The State Engineer’s Office has the responsibility to stop any water diversions that it deems unnecessary for application to beneficial use.⁸⁶ For example, the water commissioner for the Roaring Fork Watershed has at times curtailed the Town of Carbondale’s diversions through its irrigation ditch system, based upon the amount of tailwater flowing unused back into the Crystal River.⁸⁷ Although such a determination is not presumptive for purposes of a change decree case, a water court may give weight to the findings of the State Engineer’s Office when considering claims of wasteful water use.

In many instances, particularly in the context of municipal and industrial water use, the General Assembly has set the standard for reasonable efficiency, with the state plumbing code and specific statutory standards.⁸⁸ To the



Figure 6. Uncovered earthen canals, like the Salvation Ditch near Aspen, are still considered a reasonably efficient means of conveyance for irrigation water, despite the seepage, evaporation, and phreatophytic growth they permit. (Sharon Clarke)

extent that water conservation measures surpass the established statutory standards, there should be no grounds for arguing that the original use was somehow wasteful.

Yet outside of such statutory standards, little precedent exists to help distinguish between beneficial and wasteful water use. The possibility therefore remains that some reductions in historical use achieved through water conservation efforts may not be legally transferable to other beneficial uses on the grounds of waste. While appropriators should necessarily curtail any wasteful water use that occurs under their water rights, such reductions will need to be distinguished from reductions of otherwise reasonable water use that can potentially be transferred to other beneficial uses, including to the CWCB for ISF purposes.

4.3 Water Utility Concerns – Service Obligations, “Demand Hardening” & “Revenue Erosion”

For municipal water providers, water conservation initiatives that are intended to benefit local streamflows may raise several types of concerns over their ability to provide reliable water service to existing and future customers. First and foremost, water conservation savings may be required to meet increased demands associated with future population growth, and therefore may not be eligible for contracting to the CWCB for ISF purposes. Change decree proceedings are also risky endeavors that can potentially result in reduction in the amount of water decreed to a water right, or in the case of abandonment, the entire right itself.⁸⁹ A municipal water provider’s service obligations to its current and future customers may therefore prevent them from being able to contract with the CWCB for ISF use of municipal water rights, even if a portion of those rights are not currently needed due to active conservation efforts.

In addition to planning for future water demands, municipal water providers are also preparing for a potentially drier future. Given the threat of severe recurrent droughts, water providers must retain the ability to quickly reduce demand when water supplies are limited.⁹⁰ For example, during the 2002 drought, when the runoff in Colorado was only a quarter of the historical average, short-term drought restrictions were vital in allowing water providers to stretch existing supplies further.⁹¹ Some municipal water providers, therefore, view water conservation as potentially risky in that it may “reduce the water savings potential for short-term demand management strategies during water shortages” – a concern commonly known as “demand hardening.”⁹²

Finally, some water providers may be deterred from conservation efforts due to the potential effect on their financial stability. Not only do water conservation programs cost money to implement, but by lowering customer water use, they also reduce one of the main revenue sources for most water providers.⁹³ This concern – commonly referred to as “revenue erosion” – is particularly acute for smaller water providers who are generally more dependent on water service charges than other sources of revenue, such as tap fees for new construction.⁹⁴

To a large extent municipal water providers can mitigate these concerns, if they are serious about using water conservation as a means to benefit local streamflows. First, any water conservation initiative must begin with an adequate long-term water supply plan, which allows a water provider to accurately project future water demands and thus to know what conserved water is potentially available to transfer to the CWCB’s Instream Flow Program. In addition, a contract with the CWCB for ISF use of senior municipal water rights can be structured to allow the rights to revert to the former use, if and when the water provider requires them.⁹⁵

Since the issue of demand hardening is necessarily associated with water shortages, a well thought-out drought mitigation plan can limit this risk.⁹⁶ A drought mitigation plan should account for both current and

future water needs, as indicated by a long-term water supply plan, which will allow a municipal water provider to estimate, with confidence, what conserved water might be available for ISF use.

Finally, with respect to the concern of revenue erosion, water providers can quantify the actual risk by fully accounting for the economic advantages of water conservation, including lower operational costs (particularly in terms of energy use), stabilized peak demands, and avoiding or deferring infrastructural improvements.⁹⁷ Many of these savings can be demonstrated in a comprehensive long-term water supply plan. By recognizing these savings, a municipal water provider can distinguish between water conservation measures that will truly impair their financial security and those that will ultimately be to the provider's financial benefit. As for the actual costs of water conservation efforts, state and federal funding can significantly lower the burden of such activities on the provider's operating budget.⁹⁸

While service obligations, demand hardening, and revenue erosion are legitimate concerns associated with water conservation efforts, the risk can be minimized through comprehensive long-term supply and drought planning. Such planning efforts will allow a water provider to engage in water conservation efforts to benefit local streamflows, without jeopardizing the provider's fiscal and operational ability to meet current and future water demands.

See Appendix I for answers to other frequently asked questions concerning municipal water conservation efforts.

5. General Applicability to the Roaring Fork Watershed

5.1 Conservation Efforts Targeting Historical Consumptive Use

As municipal water use represents a relatively small portion of the total amount of water consumed in the Roaring Fork Watershed (about six percent, excluding transmountain diversions), conservation efforts targeting consumptive water use should largely focus on existing irrigation practices.⁹⁹ A 2003 estimate by the State Engineer's Office indicated that agriculture was annually responsible for approximately 26,500 acre-feet of consumptive water use in the Roaring Fork Watershed, representing about 85 percent of total annual water consumption (again, excluding transmountain diversions).¹⁰⁰

In the Roaring Fork Valley, irrigation water use has changed somewhat with the development of former agricultural lands. In some cases, water rights previously used for irrigation purposes have been converted to municipal use, including landscape irrigation.¹⁰¹ Senior agricultural rights are also often used for augmentation purposes, in order to allow new, junior water rights to continue to divert during times of a call on the stream.¹⁰² In some home developments in the valley, irrigation is being maintained on open space lands and for small-scale ranching operations (e.g., hay production for horse and livestock feed).¹⁰³

There are certain environmental advantages to current water use practices in the Roaring Fork Valley. For example, irrigation water use generates delayed groundwater return flows that can serve to boost local streamflows in the late summer and fall, when they are usually at their lowest.¹⁰⁴ When agricultural water rights are used for augmentation purposes, the water that was historically consumed is often left to flow out of the watershed untouched, in order to satisfy senior water rights on the Colorado River near Grand Junction.¹⁰⁵ Nevertheless, opportunities exist for local agricultural water users to reduce their consumptive water use through conservation measures, such as rotational fallowing, conversion to low water-demand crops, or deficit irrigation, in order to make the resulting HCU credits available for ISF use.

The first step for local water interests is to identify irrigators who are potentially willing to engage in this kind of water conservation program. The feasibility of such a program will then need to be examined on a case-by-case basis, specifically considering the existing environmental benefits associated with the irrigation practice in question, the historical use of the rights involved, the historical pattern of return flows, the potential environmental benefits to the stream, and the potential injury to other appropriators if the associated HCU credits are transferred to ISF use. One or more test cases may be needed to demonstrate the practical feasibility of quantifying the reduced consumptive use associated with specific conservation efforts and transferring the associated water rights to the Instream Flow Program. In instance, Woody Creek and its tributaries may be suitable for such a pilot project given the common low streamflows that result from the combined agricultural diversions (see Figure 7).

Although municipal water use constitutes a small percentage of consumptive water use in the Roaring Fork Watershed, the potential for generating HCU credits through municipal water conservation efforts should not be ignored. In particular, reducing the consumptive use associated with landscape irrigation could produce an appreciable benefit to local streamflows, in addition to raising awareness and allowing more citizens to become actively involved in the program.

The Roaring Fork Watershed would also be an ideal place to demonstrate the feasibility of deficit irrigation as a strategy for reducing consumptive use. A program to institute weather-based irrigation control systems for municipal landscaping or partial irrigation practices for perennial hay crops could be implemented on a scale large enough to produce a measurable reduction in consumptive use, yet small enough to make quantification of HCU credits practically feasible. Such a program would have the added benefit of preserving open space associated with existing agricultural operations and municipal landscaping valuable to homeowners.

5.2 Conservation Efforts Targeting Historical Diversions

The ability to transfer the historical diversions associated with a water right to the CWCB's Instream Flow Program is necessarily limited to the stream reach between the original point of diversion and point of return flows, which, for most water rights, is a relatively short distance. Nevertheless, this concept is still relevant to water conservation efforts in the Roaring Fork Watershed, given the existence of several large municipal and agricultural water diversions in the valley that remove water from long and environmentally significant stream segments.

For example, the Town of Carbondale's diversions from Nettle Creek, tributary to the Crystal River, are conveyed approximately eleven miles by pipeline for municipal use, with most of the resulting return flows accruing to the Roaring Fork River (see Figure 8, following page).¹⁰⁶ Except for the portion of return flows from



Figure 7. Diversions from Woody Creek and its tributaries are used to irrigate pasture on the adjacent upland benches (top photo), resulting in the lower section of Woody Creek frequently being dried up for months at a time (bottom photo). (Top photo: Aspen/Glenwood MLS; bottom photo: Sharon Clarke)

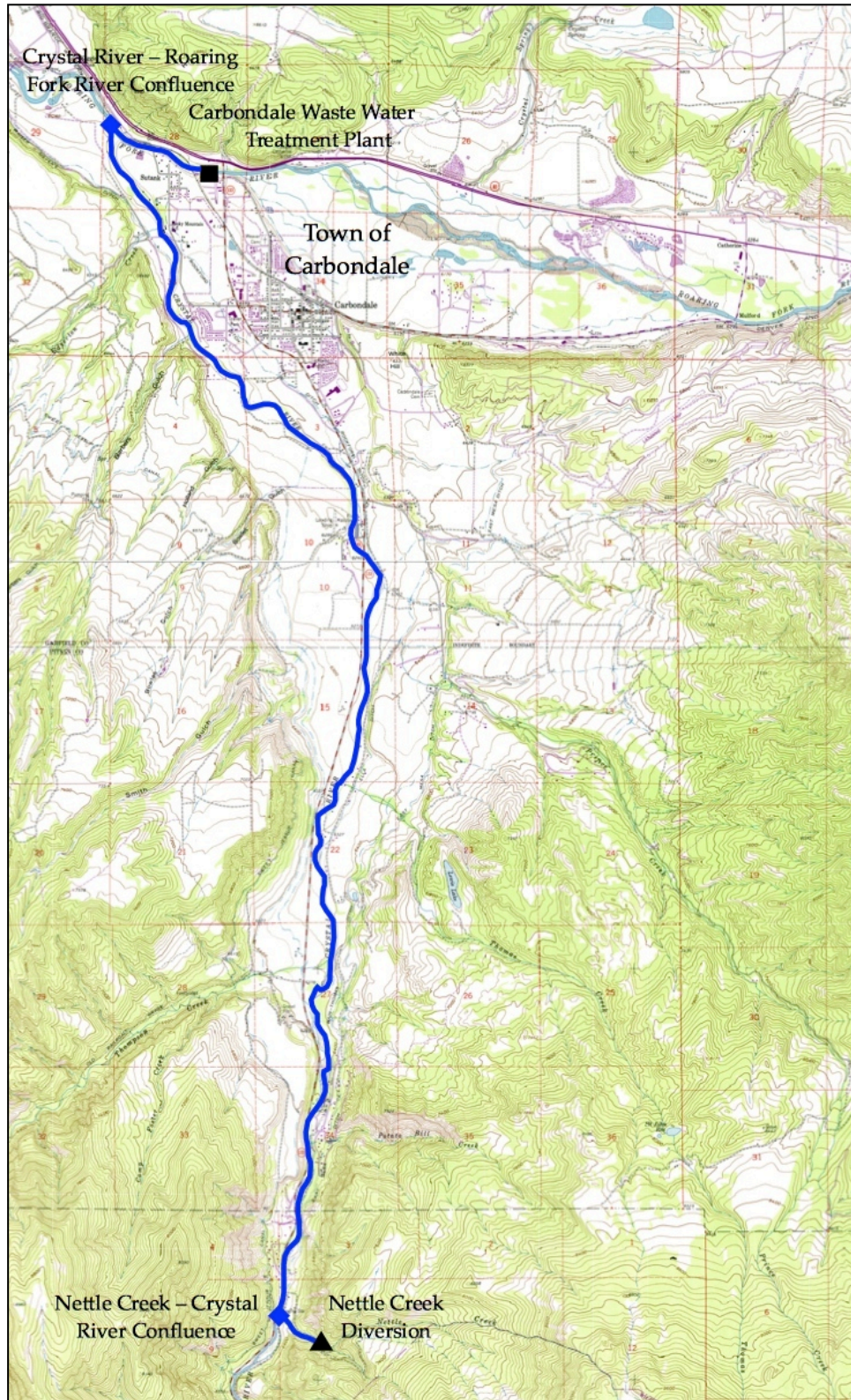


Figure 8. The Town of Carbondale's Water System and Pipeline diverts water from Nettle Creek, a tributary to the Crystal River, for municipal and industrial use in the town's service area. Treated wastewater is discharged into the Roaring Fork River, above the confluence with the Crystal River, and return flows from irrigation drain to the Roaring Fork and lower Crystal River. The blue line represents the stream reaches for which the Carbondale's diversions and customers' subsequent indoor water use are depletive. (USGS)

landscape irrigation that drain into the tail end of the Crystal River, the town's municipal diversions are entirely depletive to Nettle Creek and the lower Crystal River. Similarly, the City of Aspen's municipal withdrawals from Castle and Maroon creeks and the City of Glenwood Spring's diversions from Grizzly and No Name creeks are almost entirely depletive to those creeks.¹⁰⁷

There is also a considerable distance between the points of diversion and return flows for several major irrigation systems in the valley. The Salvation Ditch, for example, diverts water from the Roaring Fork River upstream of Aspen, from where it is conveyed approximately eleven miles for agricultural use near Woody Creek.¹⁰⁸ Return flows to the Roaring Fork River likely occur along the entire length of the ditch, due to groundwater ditch seepage; however, most of the return flows attributed to the Salvation Ditch occur in the vicinity of Woody Creek.

Given that many irrigation systems in the Roaring Fork Watershed employ flood irrigation (see Figure 9), which has a relatively low rate of consumptive use (around 30 percent), conservation efforts attempting to reduce current or foregoing diversions over historical levels may in some cases produce a greater benefit to local streams than attempts to reduce consumptive use. The feasibility and potential streamflow benefits of an ISF acquisition based on a reduction in current or foregoing diversions will be highly case specific. Nevertheless, in attempting to remedy identified streamflow shortages, local water interests should keep this option in mind.



Figure 9. Flood irrigation systems, like this ditch near Marble, consume roughly 30 percent of the water diverted, with the remaining water returning to the local tributary system via groundwater return flows and surface wastewater flows. (Gary Hubbell, United Country Colo. Brokers)

6. Alternative Approaches

Various approaches to connecting water conservation efforts with local streamflow benefits are currently being explored Colorado. Two initiatives considered potentially applicable to the Roaring Fork Watershed are the University of Arizona's "Conserve-to-Enhance" ("C2E") concept and the Western Resource Advocates' Rushing Rivers Program. In addition, the City of Aspen's 1998 intergovernmental agreement with the CWCB demonstrates another approach to benefiting local streamflows through water conservation efforts. These concepts have certain advantages and drawbacks in comparison to permanent or long-term ISF acquisitions. In all likelihood, any watershed-wide campaign to benefit local streamflows through conservation efforts will require a combination of the various strategies.

6.1 University of Arizona's Conserve-to-Enhance Concept

The "Conserve-to-Enhance" ("C2E") concept, developed by the University of Arizona's Water Resources Research Center, entails using the money a municipal water customer saves due to conservation efforts for projects to protect and enhance local streamflows.¹⁰⁹ There are a number of approaches to operating such a program. For example, the water provider can be directly responsible for calculating and including customer rate savings in their monthly water bills, collecting the portion of these savings customers willingly pay, and

allocating the funds to specific projects.¹¹⁰ Or the program can be largely administered by an organization partnering with the utility and responsible for developing a system to calculate customer rate savings to provide a means for customers to donate what they saved on their bills, and to manage the donated money.¹¹¹

Quantifying the actual amount of money a customer has saved due to individual conservation efforts is one challenge to the C2E concept. An approach that avoids this issue is to create a “check-off” program in which customers can simply choose to pay a small predetermined or scaled fee, as part of their monthly water bill, for stream protection and enhancement efforts.¹¹² In Arizona, proponents of the concept considered the possibility of using a website to allow utility customers to estimate their conservation savings themselves and make a donation online.¹¹³

Another challenge to the C2E strategy is municipal water providers’ concerns about potential lost revenue. Although this concern exists with any water conservation program, with the C2E concept these losses are intended to serve as the basis for the realized stream benefits and are thus much more apparent.

One drawback to the C2E concept is that water conservation efforts, by themselves, may not actually have any benefit to local streams. Although the concept is designed to encourage municipal water customers to reduce their water use, because the resulting reductions are not applied to another beneficial use, any undiverted water is subject to being removed by other appropriators downstream from the water provider’s point of diversion. Similarly, the reduction in municipal water diversions may diminish the amount of water that could be credited to the utility’s water rights for change decree purposes.

An advantage of the C2E concept is that, outside of the quantification issue, it is relatively simple to administer. Also, given the small overall impact of municipal diversions in general, the funds generated by the program may have more of an appreciable benefit to local streams than a conservation program designed around returning conserved municipal water to local streams. In addition, funds raised by such a program can potentially be used for stream reaches that are not necessarily affected by the municipal water provider’s diversions, but are high profile or of special public interest.

Northwest Colorado Council of Governments, Roaring Fork Conservancy, and the University of Arizona have been discussing the potential feasibility of the C2E concept with several municipal water providers in the Roaring Fork Watershed.¹¹⁴ One project they have discussed, using the funds from the program, is improving the gage system in local rivers and streams in order to allow better administration of CWCB’s ISF water rights.¹¹⁵

6.2 Western Resource Advocates’ Rushing Rivers Program

Western Resource Advocates’ Rushing Rivers Program is an initiative to identify municipal water providers on the Western Slope for which water conservation efforts, by themselves and without any ISF acquisition, can appreciably benefit local streamflows.¹¹⁶ The program’s aim is to encourage individual water conservation efforts in order to reduce municipal water diversions.¹¹⁷ The undiverted water is intended to remain in the stream below the municipal provider’s point of diversion without being formally transferred to the CWCB’s Instream Flow Program.¹¹⁸

Although in the right setting the Rushing Rivers concept could benefit local streamflows, this result requires several specific conditions. Most importantly, water that goes undiverted as a result of the program must remain in the stream below the municipal provider’s point of diversion for some appreciable distance.¹¹⁹ If other appropriators will simply divert the bypassed water, the program’s objective is undermined. Likewise,

given the relatively low rate of consumption associated with municipal water use, if the distance between the point of diversion and point of return flows and wastewater discharges is short, the benefited stream reach will be correspondingly small.¹²⁰ Finally, the program is necessarily limited to those municipal water providers whose diversions have a significant impact on local streamflows.¹²¹ These conditions necessarily limit the applicability of the Rushing Rivers concept.

The significant advantage of the Rushing Rivers Program is that it does not require any change decree proceeding – conservation efforts alone would provide measurable stream benefits. Avoiding a change decree proceeding obviates the need to quantify precisely the reduction in historical beneficial use or to be concerned about potential injury to other water users.

Conversely, by reducing a municipal provider’s water use, without any corresponding transfer of the unused water rights to another beneficial use, the Rushing Rivers Program raises the concern that the amount of historical beneficial use associated with a utility’s water rights will gradually be diminished. Nevertheless, in the right context, this program could be the most practicable option for a municipal water provider looking to benefit local streamflows through water conservation efforts.



Figure 10. Through an intergovernmental agreement with the CWCB, Aspen has agreed to exercise its water rights in Castle Creek, including those for municipal diversions at the Midland Flume (above), in order to ensure that the CWCB’s 1976 minimum ISF water right (for 12 c.f.s.) is satisfied. (Brent Gardner-Smith, Aspen Journalism)

6.3 Operational Agreements

When the CWCB uses a senior water right for ISF purposes, the Board is, in effect, exercising the water right’s senior priority in order to call out water rights that would otherwise be entitled to divert. However, instream flows can still be benefited without the CWCB directly making actual use of a senior water right, simply by how the water right is operated.

For example, the City of Aspen’s 1998 intergovernmental agreement with the CWCB concerning Castle Creek does not permit the CWCB to exercise the city’s water rights and thus did not require a legal change decree.¹²² Rather the agreement provides that Aspen will bypass water otherwise available to it under its various water rights, in order to ensure that the CWCB’s existing ISF water right on Castle Creek is met (see Figure 10).¹²³ To make up for the bypassed diversions, the city can draw water from several groundwater wells in Roaring Fork alluvial aquifer, which has a delayed and less direct effect on local streamflows.¹²⁴

The main limitation to this arrangement is that the CWCB does not directly benefit from the city’s senior water rights. Aspen will not make a call on its water rights in order to provide water to the CWCB. The CWCB’s 1980 ISF water right on Castle Creek must be in priority, but going unmet, for the agreement to be in operation.¹²⁵ Furthermore, if there were appropriators below the city’s diversions with water rights senior to the CWCB’s ISF water right, Aspen could not prevent them from diverting the bypassed water.

This kind of operational agreement also raises diminishment concerns. If Aspen ever sought to legally change the use of the rights, it likely would not be able to include the bypassed water as part of the historical beneficial use credited to its water rights.

However given that Aspen operates the main diversions on lower Castle Creek, the city can effectively determine whether or not the minimum ISF is met. Aspen is also unlikely to ever need to formally change the water rights involved, and thus these rights will not be subject to any historical beneficial use analysis that could result in diminishment of the rights' decreed amounts. Not every municipal water provider will be in a similar situation. While the Aspen-CWCB intergovernmental agreement is based on the city's ability to draw upon alternative sources of water, conceivably active water conservation efforts could serve as the basis for this kind of arrangement.

7. Conclusion & Recommendations

Although there are several potential approaches to employing water conservation as a means to benefit local streamflows, only the CWCB can appropriate or acquire water rights for the purpose of maintaining flows in a specific stream reach, without a diversion, in order to preserve and improve the natural environment. The CWCB can acquire senior water rights, or interests in water rights, for ISF purposes through various contractual arrangements, which may require formally changing or adding to the decreed type and place of use in water court. Although the CWCB has never accepted an ISF acquisition that was premised on the original user's active water conservation efforts, as long as the proposed change is executed in accordance with the restrictions imposed in any change decree, such efforts could conceivably be used to make senior water rights available for contracting to the CWCB's Instream Flow Program. Therefore by reducing the current or foregoing beneficial use of an absolute water right, either in relation to historical consumptive use or historical diversions, conservation measures could potentially serve as the basis for an ISF acquisition

There are three principal limitations to this concept, which are imposed on any change decree. First, the historical use for which credit is sought must have been lawful and beneficial. To obtain a change decree for a water right, the applicant must be capable of adequately documenting the lawful, beneficial use of the water right in question. Second, a proposed change will not be permitted if it would injure other water rights. The applicant must be able to demonstrate that the proposed change can be executed without injury to other water users. Finally, a change decree proceeding is also an appropriate venue for opponents to raise claims that the owner had previously abandoned all or a portion of the water rights in question; however, recent legislation has largely precluded such claims in the context of conservation efforts and ISF acquisitions.

There are two important lingering legal concerns with respect water conservation efforts of any kind. First, there is the possibility that if a water user implements conservation efforts that gradually reduce their water demands and then attempts to legally transfer the unused portion of their water rights to another beneficial use (such as ISF purposes), the period of reduced use prior to applying for a change decree may ultimately be factored into the historical beneficial use attributed to the water right proposed for change. Thus conservation efforts could diminish the amount of water that is potentially available to transfer to another beneficial use in a change decree proceeding. To avoid this result, conservation efforts should be designed to prevent a prolonged period of reduced use prior to filing a change decree for an alternative use of the right in question.

Another legal concern is the potential for opponents to a proposed change decree to argue that water conservation "savings" represent water that was previously "wasted." A water court will necessarily exclude any prior use it deems wasteful from the calculation of historical beneficial use. Whether an appropriator's

practices meet the required legal standard for beneficial use (i.e., “reasonable efficiency”) is a question of fact gauged according to prevailing local customs and practices. While appropriators should necessarily curtail any wasteful water use that occurs under their water rights, such reductions must be distinguished from reductions of otherwise reasonable water use that can potentially be transferred to other beneficial uses, including to the CWCB for ISF purposes.



Figure 11. The Crystal River is one of the streams that experiences seasonal streamflow shortages, which potentially could be benefited by local conservation efforts (Greg Watts)

While the concept of employing conservation efforts as a means to make water rights available for the CWCB’s Instream Flow Program is novel, such initiatives could be a valuable means of ensuring adequate streamflows in the Roaring Fork Watershed (see Figure 11). In particular, opportunities exist for local agricultural water users to reduce their current beneficial consumptive use through selective irrigation and crop management (e.g., rotational fallowing, deficit irrigation practices, planting of drought-resistant grass varieties), so that the resulting historical consumptive use credits can be contracted to the CWCB for ISF use. And the existence in the valley of several large municipal and agricultural water diversions that remove water from long and environmentally significant stream segments suggests that conservation measures targeting historical diversions could also make water available for ISF use.

Based on these conclusions, Roaring Fork Conservancy and its partners should consider the following recommendations for legal, policy, fundraising and other activities as the foundation for a comprehensive water conservation campaign in the Roaring Fork Watershed:

1. If the threat of low streamflows in 2012 requires, launch a public campaign to solicit agricultural water users who are willing to temporarily cease irrigation and loan their water rights to the CWCB’s Instream Flow Program, in order to prevent local streams with existing minimum ISF rights from running dry. Support legal and engineering analysis required for the State Engineer’s approval of such temporary loans. Similarly support permanent or long-term ISF acquisitions, if and when willing water users come forward.
2. Investigate the feasibility of local water conservation efforts based on rotational fallowing, selective crop management, and deficit irrigation practices that make historical consumptive use credits available for contracting to the CWCB for ISF purposes. Pursue financial support for such a program from the CWCB’s Alternative Agricultural Transfer Methods Grant Program, and solicit technical support from Colorado State University. Support engineering analysis to quantify the resulting reduction in relation to historical beneficial use and legal work to transfer the conserved water to the CWCB Instream Flow Program.
3. Investigate the feasibility of a pilot water conservation project for a local municipal water provider based on the widespread adoption of weather-based landscape irrigation controllers. Pursue financial assistance for such a project from the Bureau of Reclamation’s WaterSMART Water and Energy Efficiency Grant program, if and when funding becomes available. Assist in preparing the legal and engineering analysis required to support a change decree for ISF use based upon this concept.

4. Investigate the engineering feasibility of a local water user strategically reducing their current or foregoing diversions through conservation measures, and in coordination with the CWCB, using the remaining water for ISF purposes between the original point of diversion and point of return flows. Assist in preparing the legal and engineering analysis required to support a change decree for ISF use based upon this concept.
5. Meet with state representatives from the valley to discuss the use of conservation measures as a means to make water available for ISF use. Explore potential legislative avenues for addressing the lingering legal concerns surrounding the use of water conservation as a means to make water available for ISF purposes (*see* section 4).
6. Encourage and assist local municipal water providers to develop comprehensive water supply, drought mitigation, and water conservations plans pursuant to state law, in order that they may benefit from the recent legal protections against claims of abandonment provided by the General Assembly (Senate Bill 05-133).
7. Encourage the Colorado River Water Conservation District and the local water conservancy districts (Basalt and West Divide) to develop water conservation certification programs, so that private water users can take advantage of the legal protections against claims of abandonment afforded by Senate Bill 05-133.
8. Develop a “Conserve-to-Enhance” type of program (*see* section 6.1) for one or more municipal water providers in the watershed, and encourage its funds to be allocated initially to improving local streamflow gauges, with specific stream channel restoration and enhancement projects as a secondary use of available funds.
9. Consider establishing a watershed-wide public educational campaign on landscape irrigation efficiency, working through Colorado State University Extension network. Advocate for the CSU Extension offices in Eagle, Garfield, and Gunnison counties to coordinate and administer such a program, and encourage Pitkin County to reestablish an Extension office with a water conservation program focusing on landscape irrigation and small acreage management. Promote the existing CSU Extension programs of Master Gardeners and Native Plant Masters as a means to disseminate information on low-water demand landscaping and irrigation efficiency.
10. Continue to promote a watershed-wide scope to local water conservation efforts. Connect water conservation efforts in the valley to statewide water management planning efforts, specifically the Interbasin Compact process created under the Colorado Water for the 21st Century Act (2005). Consider potential funding for local water conservation efforts from the Colorado’s Water Supply Reserve Account and the Bureau of Reclamation’s WaterSMART Cooperative Watershed Management Program (second or third phases in FY 2013), if and when funding becomes available.

Glossary

Abandonment	For an absolute water right, termination of the right in whole or in part as a result of the owner's intent to discontinue permanently the use of all or part of the water available under the right. Section 37-92-103(2), C.R.S.
Beneficial Use	The use of that amount of water that is reasonable and appropriate under reasonably efficient practices to accomplish without waste the purpose for which the appropriation is lawfully made. Section 37-92-103(4), C.R.S.
Change Decree	Legal decree issued in a Colorado water court permitting certain types of changes in the decreed use of a water right, including a change in the point of diversion or type, place, or time of beneficial use of a water right. Section 37-92-103(5), C.R.S.
Consumptive Use	Act of permanently removing water from a stream system through the beneficial use of the water. <i>R.J.A., Inc. v. Water Users Ass'n of Dist. No. 6</i> , 690 P.2d 823 (Colo. 1984).
Deficit Irrigation	Irrigation practices that apply less than the full amount of water that can potentially be used by the crop over the growing season, such as limited or partial season irrigation. Colorado Water Conservation Board, "Alternative Agricultural Water Transfer Methods Grant Program Summary" (2011).
Diversion	Removal of water from its natural course or location, or control of water in its natural course or location, by means of a control structure, ditch, canal, flume, reservoir, bypass, pipeline, conduit, or other structure or device. Section 37-92-103(7), C.R.S.
Historical Beneficial Use	The amount of water credited to an absolute water right for change decree purposes, representing the actual beneficial use historically accomplished under the right. Historical beneficial use is comprised of historical diversions and historical consumptive use. <i>Williams v. Midway Ranches Property Owners Ass'n, Inc.</i> , 938 P.2d 515, 521 (Colo. 1997).
Instream Flow Program	Program administered by the Colorado Water Conservation Board to use water rights for the beneficial purpose of maintaining flows between specific points in a stream channel, without a diversion, in order to preserve and improve the natural environment. Section 37-92-102(3), C.R.S.
No-Injury Rule	In a change decree proceeding, legal protection afforded to other water rights owners, regardless of the relative priority of their rights, of a vested interest in the continuation of stream conditions as they existed at the time of their respective appropriations. Section 37-92-305(3)(a) and (4)(a), C.R.S.

Return Flows	Water returning to the local stream system after beneficial use through subsurface groundwater flows. <i>City of Boulder v. Boulder & Left Hand Ditch Co.</i> , 192 Colo. 219 (Colo. 1976).
Waste	Any diversion of water not necessary for application to a beneficial use. Sections 37-92-103(4) and 37-92-502(2)(a), C.R.S.
Wastewater Flows	Water that remains on the surface and within the control of the original appropriator after its initial application or use. <i>City of Boulder v. Boulder & Left Hand Ditch Co.</i> , 192 Colo. 219 (Colo. 1976).

Citations

¹ Ruedi Water & Power Auth., “Roaring Fork Watershed Plan,” 8 (Apr. 12, 2012) (available at <http://www.roaringfork.org/watershedplan>).

² *Id.* at 17 (Regional Water Management Goal).

³ *Id.* at 13 (Recommended Action SW B1f.).

⁴ See Colo. Rev. Stat. §§ 37-92-102(3), -103(4) (LexisNexis 2011) (stating that “In the adjudication of water rights pursuant to this article and other applicable law, no other person or entity shall be granted a decree adjudicating a right to water or interests in water for instream flows in a stream channel between specific points, or for natural surface water levels or volumes for natural lakes, for any purpose whatsoever.”). See also *Colo. Water Conserv. Bd. v. Central City*, 125 P.3d 424, 438 (Colo. 2005).

But note that Colorado water law arguably allows water to be used for aesthetic, fishery and wildlife purposes, so long as the appropriation is affected by some kind of “diversion” whereby the water is controlled within the natural stream channel by means of a structure or device. Colo. Rev. Stat. § 37-92-103(4) and (7) (LexisNexis 2011). See also *Bd. of County Comm’rs v. Upper Gunnison River Water Conservancy Dist.*, 838 P.2d 840 (Colo. 1992).

⁵ *Id.* (providing that the CWCB “is hereby vested with the exclusive authority, on behalf of the people of the state of Colorado, to appropriate in a manner consistent with sections 5 and 6 of article XVI of the state constitution, such waters of natural streams and lakes as the board determines may be required for minimum stream flows or for natural surface water levels or volumes for natural lakes to preserve the natural environment to a reasonable degree.”).

⁶ See *id.* and Colo. Rev. Stat. § 37-92-102(3)(c.5) (LexisNexis 2011) (stating that “the [CWCB] may not acquire conditional water rights or change conditional water rights to instream flow uses.”). See also Colo. Rev. Stat. § 37-82-105(2) (LexisNexis 2011) (providing for short-term loans of water rights to the CWCB).

⁷ Regarding permanent and long-term ISF acquisitions, see Colo. Rev. Stat. § 37-92-102(3) (LexisNexis 2011). Regarding temporary loans, see Colo. Rev. Stat. § 37-82-105(2) (LexisNexis 2011).

⁸ Colo. Rev. Stat. § 37-83-105 (LexisNexis 2011). Note that the contracted water right cannot be adjudicated to or diverted at a groundwater well located more than one-hundred feet from the bank of the nearest flowing stream. *Id.* at (2)(b)(IV).

⁹ *Id.* at (2)(a) and (2)(a)(IV).

¹⁰ *Id.*

¹¹ *Id.* at (2)(a) (stating that “A water right owner may loan water to the Colorado water conservation board for use as instream flows pursuant to a decreed instream flow water right held by the board...” (emphasis added)).

¹² Colo. Rev. Stat. § 37-92-102(3) (LexisNexis 2011).

¹³ *Id.* (providing that “The [CWCB] shall file a change of water right application or other application with the water court to obtain a decreed right to use water for instream flow purposes under a contract or agreement for a lease or loan of water, water rights, or interests in water...”). For an explanation of situations where a change decree is not required, see section 6.3 of this report.

¹⁴ *Id.* (emphasis added). See also Colo. Sen. Bill 02-156, 63rd Gen. Assembly, 2nd Reg. Sess. (May 21, 2002).

¹⁵ 2 Colo. C. Reg. 408-2(6f)(1) (LexisNexis 2011) (providing that in deciding whether or not to accept an ISF acquisition, the Board will consider the extent to which the acquisition could either help meet an existing ISF right in below average water years, or in improving the natural environment to a reasonable degree).

¹⁶ Regarding flushing and flooding flows, see Ruedi Water & Power Auth., “Roaring Fork Watershed Plan Phase I: State of the Roaring Fork Watershed Report, App. 3.4.2, p. 8 (2008) (available at <http://www.roaringfork.org/sitepages/pid272.php>).

¹⁷ 2 Colo. C. Reg. 408-2(6e)(5) and (6f)(1) (LexisNexis 2011).

¹⁸ Colo. Rev. Stat. § 37-92-102(3) (LexisNexis 2011) (requiring that “Prior to the initiation of any such appropriation or acquisition, the [CWCB] shall request recommendations from the division of wildlife and the division of parks and outdoor recreation.”). *Also see* 2 Colo. C. Reg. 408-2(6f)(2) (LexisNexis 2011).

¹⁹ Colo. Rev. Stat. § 37-92-102(3) (LexisNexis 2011) (requiring that “As a condition of approval of a proposed contract or agreement for a lease or loan of water, water rights, or interests in water pursuant to this subsection (3), the [CWCB] shall obtain confirmation from the division engineer that the proposal is administrable and is capable of meeting all applicable statutory requirements.”).

²⁰ *Id.* (providing that the CWCB’s authority to appropriate and acquire water rights for ISF purposes shall not be construed “to deprive the people of the state of Colorado of the beneficial use of those waters available by law and interstate compact.”). *Also see* 2 Colo. C. Reg. 408-2(6e)(7)-(8) (LexisNexis 2011).

²¹ *See e.g.*, Dist. Court, Water Div. 5, Case No. 80CW18, *Concerning the application for water rights of Colorado Water Conservation Board in Hunter Creek in Pitkin County*, “Findings of Fact, Conclusion of Law, Judgment, and Decree of Water Court” (May 23, 1990); Dist. Court, Water Div. 5, Case No. 80CW61, *Concerning the application for water rights of the City of Aspen and the Colorado Water Conservation Board in the Roaring Fork River or its tributaries in Pitkin County*, “Findings of Fact, Conclusions of Law, Judgment and Decree” (Aug. 2, 1985); Dist. Court, Water Div. 5, Case No. 80CW62, *Concerning the application for water rights of the City of Aspen and the Colorado Water Conservation Board in the Roaring Fork River or its tributaries in Pitkin County*, “Findings of Fact, Conclusions of Law, Judgment and Decree” (Dec. 6, 1985); Colo. Water Conserv. Bd. and Lazy-O Cattle Co., “Quit Claim Deed” (May 21, 1987).

²² Colo. Rev. Stat. § 37-92-102(3) (LexisNexis 2011) (providing that “The [CWCB] shall file a change of water right application or other application with the water court to obtain a decreed right to use water for instream flow purposes under a contract or agreement for a lease or loan of water, water rights, or interests in water...”). For an explanation of situations where a change decree is not required, *see* section 6.3 of this report.

²³ *Williams v. Midway Ranches Property Owners Ass’n, Inc.*, 938 P.2d 515, 521 (Colo. 1997) (holding that “Over an extended period of time, a pattern of historic diversions and use under the decreed right at its place of use will mature and become the measure of the water right for change purposes...”). *See also Orr v. Arapahoe Water & Sanitation District*, 753 P.2d 1217, 1224 (Colo. 1988) (providing that a “senior appropriator is not entitled to enlarge the historical use of a water right by changing the point of diversion and then diverting from the new location the full amount of water decreed to the original point of diversion, even though the historical use at the original point of diversion might have been less than the decreed rate of diversion.”). *And see Santa Fe Trail Ranches Property v. Simpson*, 990 P.2d 46, 53 (Colo. 1999) (holding that the amount of water available in a change decree proceeding is based on historical beneficial use because “A water right comes into existence only through application of the water to the appropriator’s beneficial use; that beneficial use then becomes the basis, measure, and limit of the appropriation.”). *Also generally see Farmers Res. & Irr. Co. v. City of Golden*, 44 P.3d 241, 246 (Colo. 2002).

But see Flasche v. Westcolo Co., 112 Colo. 387, 396-397 (Colo. 1944) (allowing an appropriator to transfer the full decreed amount of his right when the alternate point of diversion was sought as substitution for a ditch that was washed out and applicant sought to irrigate the same lands as under the original decree). *And see Twin Lakes Reservoir & Canal Co. v. City of Aspen*, 193 Colo. 478, 484-485 (Colo. 1977) (allowing transmountain conditional water rights to be transferred in amount equal to their “originally contemplated draft”).

²⁴ *See e.g., Santa Fe Trail Ranches*, 990 P.2d at 58 (stating that “In a change of use and augmentation case, the applicant must demonstrate that the timing of diversions and the quantity of consumption for the changed use will not exceed those of the perfected appropriation...”).

²⁵ Colo. Rev. Stat. § 37-92-302(2)(a) (LexisNexis 2011) (requiring that in the application for a change a water right include, among other information, “records or summaries of records of actual diversions of each right the applicant intends to rely on to the extent such records exist...”). Regarding the preclusive effect of a prior historical beneficial use analysis, see *Midway Ranches*, 938 P.2d at 522, 525-526 (stating that “When a determination of historic usage has not previously been made, the water right must be quantified to effectuate a change or augmentation-plan case.”).

Regarding the representative period of years, see e.g., *In re Water Rights of Cent. Colo. Water Conserv. Dist.*, 147 P.3d 9, 14 (Colo. 2006) (stating that “For change purposes, the lawful historic use of an absolute decree is measured over a representative period of time for the appropriation made.”). For an example of a historical use analysis, see *U.S. v. May*, 756 P.2d 362 (Colo. 1988). See also *Pueblo W. Metro. Dist. v. S.E. Colo. Water Conserv. Dist.*, 717 P.2d 955, 960-961 (Colo. 1986) (upholding a 13-year period as appropriate for purposes of calculating historical beneficial use, despite the fact that there were only diversion records for two of the years); and *A & M, LLC v. S.E. Colo. Water Conserv. Dist.*, 120 P.3d 710, 720 (Colo. 2005) (stating that in a change decree proceeding, “the appropriator ... appears [before the water court in a change application] for the purpose of demonstrating the actual historical beneficial use of an absolute water right.”).

²⁶ Dist. Court, Water Div. 5, Case No. 05CW264, *Concerning the application for water rights of the Colorado Water Conservation Board in Summit County*, “Decree of the Water Court” (Apr. 14, 2011); Dist. Court, Water Div. 1, Case No. 90CW193, *Concerning the application for water rights of the Colorado Water Conservation Board on behalf of the State of Colorado and water rights of the City of Boulder in Boulder County*, “Findings of Fact, Conclusions of Law and Decree” (Dec. 20, 1993); Dist. Court, Water Div. 5, Case No. 80CW18, *Concerning the application for water rights of Colorado Water Conservation Board in Hunter Creek in Pitkin County*, “Findings of Fact, Conclusion of Law, Judgment, and Decree of Water Court” (May 23, 1990); Dist. Court, Water Div. 5, Case No. 80CW62, *Concerning the application for water rights of the City of Aspen and the Colorado Water Conservation Board in the Roaring Fork River or its tributaries in Pitkin County*, “Findings of Fact, Conclusions of Law, Judgment and Decree” (Dec. 6, 1985); Dist. Court, Water Div. 5, Case No. 80CW61, *Concerning the application for water rights of the City of Aspen and the Colorado Water Conservation Board in the Roaring Fork River or its tributaries in Pitkin County*, “Findings of Fact, Conclusions of Law, Judgment and Decree” (Aug. 2, 1985); Dist. Court, Water Div. 1, Case No. 79CW308, *In the matter of the application of the State of Colorado for water rights in Boulder Creek, a tributary of the South Platte River*, Ruling of the Referee, Findings of Fact, Conclusions of Law, and Decree Approving Change of Water Right, (Mar. 31, 1981).

²⁷ *Id.*

²⁸ See *Midway Ranches*, 938 P.2d at 521.

²⁹ See e.g., Colo. Found. for Water Ed., “Citizen’s Guide to Colorado Water Law,” 3rd ed., p. 9 (2009) (defining consumptive use as “water use that permanently withdraws water from its source; water that is no longer available because it has evaporated, been transpired by plants, incorporated into products or crops, consumed by people or livestock, or otherwise removed from the immediate water environment.”).

³⁰ See e.g., *Green v. Chaffee Ditch Co.*, 150 Colo. 91, 101 (Colo. 1962) (affirming change decree for 90 acre feet of water “necessarily consumed by plant life to produce a maximum crop” on the given tract, plus an additional five acre feet “lost by evaporation and seepage while the water is in transit from the headgate ... to the farm.”).

³¹ *Santa Fe Trail Ranches*, 990 P.2d at 58 (stating that “In a change of use..., the applicant must demonstrate ... that return flows of native waters from the decreed use at its place of use – upon which junior appropriators and prospective new appropriators often depend for their supply – will not be diminished.”).

³² Colo. H. Bill 08-1280, 66th Gen. Assembly, 2d Reg. Sess. (Apr. 21, 2008). See Colo. Rev. Stat. §§ 37-92-102(3), -305(3)(b) (LexisNexis 2011) (providing that “Decrees for changes of water rights that implement a contract or agreement for a lease, loan, or donation of water, water rights, or interests in water to the Colorado water conservation board for instream flow use under section 37-92-102 (3) (b) shall provide that the board or the lessor, lender, or donor of the water may bring about beneficial use of the historical consumptive use of the changed water right downstream of the instream flow reach as fully consumable reusable water, subject to such terms and conditions as the water court deems necessary to prevent injury to vested water rights or decreed conditional water rights.”).

³³ For example, based on recent estimates of statewide water demands, in 2008 municipal and industrial water demand required 974,500 a.f. in direct diversions, only a small percentage of which is presumably consumed. Comparatively, in the same year, irrigation consumed approximately 4,791,000 acre-feet of water. Colo. Water Conserv. Bd., “Statewide Water Supply Initiative 2010,” tabs. 4-3 and 4-12 (Jan. 2011).

³⁴ Regarding the rate of consumptive use associated with various irrigation systems, see Colo. Ag. Water Alliance, “Meeting Colorado’s Future Water Supply Needs: Opportunities and Challenges Associated with Potential Agricultural Water Conservation Measures,” tabl. 4-1 (Feb. 11, 2008). Regarding the rate of consumptive use associated with indoor water use, see e.g., Colo. Div. of Water Resources, “CRDSS Task Memorandum 1.15-17 – Water Rights Planning Model: Analysis of Irrigation and Municipal Return Flows,” 5. Also see e.g., *Upper Eagle Reg. Water Auth. v. Simpson*, 167 P.3d 729, 734 (Colo. 2007), and Dist. Court, Water Div. 5, Case No. 88CW421, *Concerning the application for water rights of the Town of Carbondale, in Garfield and Pitkin Counties*, Findings of Fact, Conclusions of Law, and Judgment and Decree of the Water Judge, ¶ 11 (Jun. 2, 1994) (assuming a 5 percent rate of consumptive use for indoor water use).

³⁵ Generally see Colo. Water Conserv. Bd., “Alternative Agricultural Water Transfer Methods Grant Program Summary” (May 2011).

³⁶ See U.S. Env. Protection Agency, “Weather-based Landscape Irrigation Controllers,” (Jan. 2011) (available at http://www.epa.gov/WaterSense/docs/ws-fact-controller_Jan2011_508.pdf); U.S. Bur. of Reclamation, “Weather and Soil Moisture Based Landscape Irrigation Scheduling Devices,” 2nd ed. (Aug. 2007) (available at www.usbr.gov/waterconservation/docs/SmartController.pdf).

³⁷ See Neil Hansen et al., “Water-conserving cropping systems: Lower South Platte Irrigation Research and Demonstration Project,” *Colo. Water*, 9 (Aug. 2010).

³⁸ Note that although in some cases the Colorado Supreme Court has equated the term “historical use” with “historic consumptive use” (e.g., *State Engineer v. Bradley*, 53 P.3d 1165, 1169, n. 9 (Colo. 2002)), the Court has also stated that historical beneficial use is only “typically quantified in acre-feet of water consumed.” *Midway Ranches*, 938 P.2d at 521 (emphasis added).

Also note that the Supreme Court has repeatedly described the amount of water available in a change decree proceeding without any mention of consumptive use. See e.g., *Weibert v. Rothe Bros., Inc.*, 618 P.2d 1367, 1371 (Colo. 1980) (“‘Historical use’ as a limitation on the right to change a point of diversion has been considered to be an application of the principle that junior appropriators have vested rights in the continuation of stream conditions as they existed at the time of their respective appropriations.”); *Orr*, 753 P.2d at 1223 (stating that “the right to change a point of diversion is limited in quantity by historical use at the original decreed point of diversion,” and holding that a change of water right must limit the amount of water being changed to the “same amount historically diverted through . . . the original decreed points of diversion.”); and *S.E. Colo. Water Conserv. Dist. v. Rich*, 625 P.2d 977, 980 (Colo. 1981) (stating that “The right to change a point of diversion is limited in quantity by historical use.”).

Admittedly, *Burlington Ditch, Res. & Land Co. v. Metro Wastewater Rec. Dist.*, appears to the contrary, as the Court expressly stated that “Historical consumptive use under the adjudicated water right . . . is the quantitative measure of the water right.” 256 P.3d 645, 662 (Colo. 2011). However, the Court’s pronouncement in *Burlington Ditch* can be understood in the context of the surrounding legal analysis.

The statement in *Burlington Ditch* that historical consumptive use is the “quantitative measure of a water right” was based on *Midway Ranches*, 938 P.2d at 522, and *In re Water Rights of Central Colorado Water Conservancy Dist.*, 147 P.3d at 14. Yet neither of these cases used the term “consumptive” or “consumptive use” when characterizing the amount of water that was available for change decree purposes. E.g., see *Midway Ranches*, 938 P.2d at 522 (“[T]he right to make a change to a tributary water right, such as a change in point of diversion or place or type of use, is limited in time and quantity to *historic use*.”) (emphasis added) and *In re Water Rights of Central Colorado Water Conservancy Dist.*, 147 P.3d at 14 (stating that “Thus ‘the right to change a . . . type, place or time of use, is limited by the appropriation’s *historic use*.’” (citing *Santa Fe Trail Ranches*, 990 P.2d at 54) (emphasis added)).

Moreover, the Court’s statement in *Burlington Ditch* preceded the point that “The flow rate specified in a decree for a point of diversion is not equivalent to the measure of the water right.” 256 P.3d at 662. Therefore *Burlington Ditch* can be understood to be referring to the “amount of consumable water available for transfer,” as the Court described a similar transfer in *Santa Fe Trail Ranches*. 990 P.2d at 59. This interpretation is supported by the preceding statement in *Burlington Ditch* that “[t]he amount of water available for use under the changed right employing the original priority date . . . is subject to a calculation of historical beneficial consumptive use lawfully made under the decreed prior appropriation” (emphasis added; internal citation omitted), which indicates the Court’s recognition that limitation to historical consumptive use is but one of several conditions imposed on change decree limitations. 256 P.3d at 662.

³⁹ See e.g., Dist. Court, Water Div. 1, Case No. 81CW355, *Concerning the application of the City of Longmont in Boulder County*, “Findings of Fact,” ¶¶ 15, 19, and 32 (May 20, 1983).

⁴⁰ See Dist. Court, Water Div. 5, Case No. 05CW264, *Concerning the application for water rights of the Colorado Water Conservation Board in Summit County*, “Decree of the Water Court” (Apr. 14, 2011); Dist. Court, Water Div. 1, Case No. 90CW193, *Concerning the application for water rights of the Colorado Water Conservation Board on behalf of the State of Colorado and water rights of the City of Boulder in Boulder County*, “Findings of Fact, Conclusions of Law and Decree” (Dec. 20, 1993); Dist. Court, Water Div. 5, Case No. 80CW18, *Concerning the application for water rights of Colorado Water Conservation Board in Hunter Creek in Pitkin County*, “Findings of Fact, Conclusion of Law, Judgment, and Decree of Water Court” (May 23, 1990); Dist. Court, Water Div. 5, Case No. 80CW62, *Concerning the application for water rights of the City of Aspen and the Colorado Water Conservation Board in the Roaring Fork River or its tributaries in Pitkin County*, “Findings of Fact, Conclusions of Law, Judgment and Decree” (Dec. 6, 1985); Dist. Court, Water Div. 5, Case No. 80CW61, *Concerning the application for water rights of the City of Aspen and the Colorado Water Conservation Board in the Roaring Fork River or its tributaries in Pitkin County*, “Findings of Fact, Conclusions of Law, Judgment and Decree” (Aug. 2, 1985); Dist. Court, Water Div. 1, Case No. 79CW308, *In the matter of the application of the State of Colorado for water rights in Boulder Creek, a tributary of the South Platte River*, Ruling of the Referee, Findings of Fact, Conclusions of Law, and Decree Approving Change of Water Right, (Mar. 31, 1981).

Regarding Supreme Court precedent on this issue, the Court has often characterized historical beneficial use as a measure of “historic diversions and use.” *Midway Ranches*, 938 P.2d at 521. *And see Santa Fe Trail Ranches*, 990 P.2d at 58 (“In a change of use and augmentation case, the applicant must demonstrate that the timing of diversions and the quantity of consumption for the changed use will not exceed those of the perfected appropriation...”). *And see Danielson v. Kerbs Ag., Inc.*, 646 P.2d 363, 373 (Colo. 1982) (“The historical use of a particular water right is not measured solely by the amount of water withdrawn and applied to beneficial use, but also by the amount of return flow.”).

⁴¹ Regarding applying for a change decree, see Colo. Rev. Stat. §§ 37-92-302(1), -304, and -305(3)(a) (LexisNexis 2011). Regarding statements of opposition, see Colo. Rev. Stat. § 37-92-302(1)(b) (LexisNexis 2011).

⁴² *Santa Fe Trail Ranches*, 990 P.2d at 57 (holding that in the course of demonstrating historical use, a change decree applicant may not substitute diversions that occurred for an undecreed place and use of water made at an undecreed point of diversion). *Pueblo W. Metro. Dist.*, 717 P.2d at 959 (excluding out-of-priority diversions made at an undecreed point of diversion). Note that an appropriator may “lease, loan, or exchange water” without a legal decree as permitted by state law, with the resulting use still included in the record of historical consumptive use for the right. See *Santa Fee Trail Ranches*, 990 P. 2d at 59. Regarding one type of short-term loan that does not require a formal change decree, but only the division engineer’s approval, see Colo. Rev. Stat. § 37-83-105 (LexisNexis 2011). *And see ISG, LLC v. Arkansas Valley Ditch Ass’n.*, 120 P. 3d 724, 733-734 (Colo. 2005) (holding that “the methodology for calculating historic consumptive use of the water rights over a representative period of time for a permanent change will not count or discount the years of authorized temporary use.”).

⁴³ *S.E. Colo. Water Conserv. Dist. v. Rich*, 625 P.2d 977, 981 (Colo. 1981) (accepting the premise that historical consumptive use analysis excludes illegal, out-of-priority depletions, but finding that the water use in question, though out-of-priority, was not illegal as the division engineer had consciously elected not to halt the diversions).

⁴⁴ Colo. Rev. Stat. § 37-92-305(3)(a) (LexisNexis 2011). See also *New Cache La Poudre Irrig. Co. v. Water Supply & Storage Co.*, 49 Colo. 1, 3 (Colo. 1910).

⁴⁵ *Weibert*, 618 P.2d at 1371. Also see *Enlarged Southside Irrigation Ditch Co. v. John’s Flood Ditch Co.*, 116 Colo. 580, 586 (Colo. 1947) (“The well-recognized right to change either the point of diversion of the water right or its place of use is always subject to the limitation that such change shall not injure the rights of subsequent appropriators.”).

⁴⁶ *City & Co. of Broomfield v. Farmers Res. & Irr. Co.*, 235 P.3d 296, 299 (Colo. 2010). See also *S.E. Colo. Water Conserv. Dist. v. Rich*, 625 P.2d at 979 (stating that “[t]he burden of showing absence of injurious effect is upon the applicant.”); *Weibert*, 618 P.2d at 1372 (“Where expansion of use is the injury asserted, establishment of historical use is the burden of the applicant.”). See Colo. Rev. Stat. §§ 37-92-302(1)(a), -305(3)(a) (LexisNexis 2011).

⁴⁷ *Santa Fe Trail Ranches*, 990 P.2d at 58. See also *Orr*, 753 P.2d at 1224 (holding that “a senior appropriator is not entitled to enlarge the historical use of a water right by changing the point of diversion and then diverting from the new location the full amount of water decreed to the original point of diversion, even though the historical use at the original point of diversion might have been less than the decreed rate of diversion.”).

⁴⁸ *New Cache La Poudre Irrigating Co.*, 49 Colo. at 7 (holding that “an order permitting a change in the point of diversion to be made does not, and cannot, in any way enlarge the right of its recipient by conferring upon him power to divert a greater quantity of water from the stream than he theretofore took, or to use it for a greater length of time than he was previously entitled to.”). See also *Steffens v. Rinebarger*, 756 P.2d 1002, 1007 (Colo. 1988) (holding that a “change of water right decree [must] contain an explicit limitation confining the use of the water right to the amount and time of diversions originally authorized under . . . [the] decree.”). Also see *Rominiecki v. McIntyre Livestock Corp.*, 633 P.2d 1064, 1067 (Colo. 1981) (holding that an appropriator “has no right as against a junior appropriator to divert more water than can be used beneficially, or to extend the time of diversion to irrigate lands other than those for which the appropriation was made.”).

⁴⁹ See e.g., Case No. 05CW254, “Decree of the Water Court” at ¶ 9(b).

⁵⁰ See e.g., Case No. 80CW62, “Findings of Fact, Conclusions of Law, Judgment and Decree” at ¶ 14(a).

⁵¹ *Id.*

⁵² *Santa Fe Trail Ranches*, 990 P.2d at 58 (stating that “In a change of use . . . , the applicant must demonstrate . . . that return flows of native waters from the decreed use at its place of use – upon which junior appropriators and prospective new appropriators often depend for their supply – will not be diminished.”).

⁵³ *City of Boulder v. Boulder & Left Hand Ditch Co.*, 192 Colo. 219, 222 (Colo. 1976) (recognizing that “It has been fundamental law in this state that junior appropriators have rights in return flow to the extent that they may not be injured by a change in the place of use of the irrigation water which provides that return flow.”).

⁵⁴ *City of Thornton v. Bijou Irrigation Co.*, 926 P.2d 1, 79-81 (Colo. 1996). See also *S.E. Colo. Water Conserv. Dist. v. Fort Lyon Canal Co.*, 720 P.2d 133, 146-147 (Colo. 1986); *City of Boulder*, 192 Colo. at 222.

⁵⁵ *City of Thornton*, 926 P.2d at 80-81.

⁵⁶ *Id.*

⁵⁷ Generally, see W.W. Wheeler Associates, “Snowmass Water and Sanitation District – Dry Year Yield Analysis for Snowmass Creek Water Supplies and Evaluation of Raw Water Storage Requirements” (Oct. 20, 2006).

⁵⁸ *Id.*

⁵⁹ For example, the Salvation Ditch diverts water from the upper Roaring Fork River for irrigation on McClain Flats, near Woody Creek, providing return flows into both the Roaring Fork River and Woody Creek. See Ruedi Water & Power Auth., *supra* n. 16 at § 4.1, p. 15.

⁶⁰ See Colo. Rev. Stat. § 37-92-305(4)(a) (LexisNexis 2011).

⁶¹ See *Midway Ranches Property*, 938 P.2d at 526 (holding that “The whole or the part of the water right which is the subject of a change or augmentation proceeding could not be used for any purpose if abandonment had occurred.”); and *Santa Fe Trail Ranches*, 990 P.2d at 57 (noting that “Inquiry into total or partial abandonment is also germane to a change of water right proceeding.”).

⁶² Colo. Rev. Stat. § 37-92-103(2) (LexisNexis 2011). The requisite intent need not be directly proven but may be inferred from the circumstances. *S.E. Colo. Water Conserv. Dist. v. Twin Lakes Assoc., Inc.*, 770 P.2d 1231, 1237 (Colo. 1989). Continued and unexplained nonuse of a water right for an unreasonable period of time creates a rebuttable presumption of abandonment. *City & Co. of Denver v. Snake River Water Dist.*, 788 P.2d 772, 776-777 (Colo. 1990). The amount of time considered to be “unreasonable” depends on the facts at hand, but for purpose of a division engineer’s decennial abandonment list, a ten-year period of nonuse creates a rebuttable presumption of abandonment. See Colo. Rev. Stat. §§ 37-92-401(1)(a), (1)(c), and (6), and -402(11) (LexisNexis 2011).

⁶³ Colo. Sen. Bill 02-156, 63rd Gen. Assembly, 2d Reg. Sess. (May 21, 2002). See Colo. Rev. Stat. § 37-92-103(2)(b)(I)-(III) (LexisNexis 2011).

⁶⁴ *Id.* at (2)(b)(I) and (II).

⁶⁵ *Id.* at (2)(b)(III).

⁶⁶ Colo. Rev. Stat. §§ 37-60-124 and -126(2)(a) (LexisNexis 2011).

⁶⁷ *Id.* at -126(2)(a). Covered entities that fail to develop and implement an approved plan are not eligible for receiving grant or loan funds from either the CWCB or the Colorado Water Resources & Power Development Authority. *Id.* at (2)(c) and (9) (a). Note though that local public entities can be exempted from the law if a majority of qualified electors reject the law and its provisions. Colo. Rev. Stat. § 37-60-127 (LexisNexis 2011).

⁶⁸ Col. Sen. Bill 07-008, 66th Gen. Assembly, 1st Reg. Sess. (Jun. 1, 2007). *See* Colo. Rev. Stat. § 37-60-126(2)(a) and (5) (LexisNexis 2011).

⁶⁹ *Id.* at (12)(a)-(b).

⁷⁰ Regarding the potential authority of the Colorado River Water Conservation District to operate a water conservation program, *see* Colo. Rev. Stat. § 37-46-107(1)(c) (LexisNexis 2011). Regarding the potential authority of water conservancy districts to operate such a program, *see* Colo. Rev. Stat. § 37-45-118(1)(b)(I)(C) (LexisNexis 2011) (authorizing water conservancy districts the authority “to do and perform any and all things necessary or convenient to the full exercise of the powers granted...”).

⁷¹ Colo. Rev. Stat. § 37-83-105(1) (LexisNexis 2011).

⁷² Colo. Rev. Stat. §§ 37-92-103(10.6), -305(3)(a) and (4)(a)-(b) (LexisNexis 2011).

⁷³ Colo. H. Bill 07-1012, 66th Gen. Assembly, 1st Reg. Sess. (Mar. 14, 2007) (providing protections against abandonment for temporary ISF loans). Colo. H. Bill 08-1280, 66th Gen. Assembly, 2d Reg. Sess. (Apr. 21, 2008) (providing protections against abandonment for long-term ISF leases and loans). *See* Colo. Rev. Stat. § 37-92-103(2)(b)(V)-(VI) (LexisNexis 2011).

⁷⁴ Regarding the presumption of abandonment, *see supra* n. 62.

⁷⁵ Colo. Rev. Stat. §§ 37-92-103(2) (providing that “Any period of nonuse of any portion of a water right shall be tolled...”), and -305(9)(a) (providing that “No claim for a water right may be recognized or a decree therefor granted except to the extent that the waters have been diverted, stored, or otherwise captured, possessed, and controlled and have been applied to a beneficial use...”) (LexisNexis 2011).

⁷⁶ *See* Lee, Chad J., and Sara M. Dunn, “Preserving Historical Consumptive Use During Water Leases for Instream Use,” *Colo. Lawyer*, vol. 40, no. 6, p. 49 (Jun. 2011).

⁷⁷ Colo. H. Bill 08-1280, 66th Gen. Assembly, 2d Reg. Sess. (Apr. 21, 2008). *See* Colo. Rev. Stat. § 37-92-102(3) (LexisNexis 2011) (providing that “The resulting water court decree shall quantify the historical consumptive use of the leased or loaned water right and determine the method by which the historical consumptive use should be quantified and credited during the term of the agreement for the lease or loan of the water right. Said method shall recognize the actual amount of consumptive use available under the leased or loaned water right and shall not result in a reduction of the historical consumptive use of that water right during the term of the lease or loan, except to the extent such reduction is based upon the actual amount of water available under said rights. All water rights under such decrees shall be administered in priority...”).

⁷⁸ *Id.* (requiring that “All contracts or agreements entered into by the board for leases or loans of water, water rights, or interests in water pursuant to this subsection (3) shall require the board to maintain records of how much water the board uses under the contract or agreement each year it is in effect and to install any measuring devices deemed necessary by the division engineer to administer the contract or agreement and to measure and record how much water flows out of the reach after use by the board under the contract or agreement, unless a measuring device already exists on the stream that meets the division engineer's requirements...”).

⁷⁹ *See e.g., Rominiecki*, 633 P.2d at 1067 (Colo. 1981) (holding that water rights “are limited to an amount sufficient for the purpose for which the appropriation was made, even though such limitation may be less than the decreed rate of diversion.”); *Enlarged Southside Irr. Ditch Co.*, 116 Colo. at 585 (holding that the owner of a priority for irrigation has no right “to waste water, to increase the amount or extend the time of his diversion so as to put it to double use by irrigation of other lands; nor to land, rent or sell to others the excess water.”); *Farmers Highline Canal & Reservoir Co. v. City of Golden*, 129 Colo. 575, 585 (Colo. 1954) (discounting excess irrigation above and beyond the water requirements of the track of land decreed for the original use of the water right to be changed, and stating “only that portion may be changed which previously had been necessary for proper irrigation.”); *Archuleta v. Gomez*, 200 P.3d 333, 343 (Colo. 2009) (noting that the “principle of beneficial use recognizes that any given acreage of cropland needs and is limited to a productive amount of water.”).

⁸⁰ *Id.*

⁸¹ See Colo. Rev. Stat. § 37-92-502(2)(a) (LexisNexis 2011) (requiring division engineers to issue orders against “waste,” defined as the diversion of water that “is not necessary for application to a beneficial use...”). But see Colo. Rev. Stat §§ 37-92-103, 37-92-502(2)(a), 37-84-107, 37-84-108 (LexisNexis 2011) (prohibiting “waste” but providing no specific definition).

⁸² Colo. Rev. Stat. § 37-92-103(4) (LexisNexis 2011).

⁸³ *Ready Mixed Concrete Co. v. Farmers Res. & Irr. Co.*, 115 P.3d 638, 645 (n. 4) (Colo. 2005).

⁸⁴ *Id.* Regarding the relevancy of prevailing local custom and practice, see *Middlekamp v. Bessemer Irr. Ditch Co.*, 46 Colo. 102, 113-114 (Colo. 1909) (holding that a canal company could be forced to line its canal to prevent seepage that was damaging an adjoining property, as such a requirement was not “tenable under conditions existing in Colorado.”); *Alamosa-La Jara Water Users Protection Ass’n v. Gould*, 674 P.2d 914, 935 (Colo. 1983) (holding that whether senior surface diversions amount to a reasonably efficient means of diversion must be considered “with proper regard for all significant factors, including environmental and economic concerns”); *A-B Cattle Co. v. U.S.*, 196 Colo. 539, 556-557 (Colo. 1978) (Justice Erickson, in dissent, maintaining that “In determining whether a diversion system is reasonably efficient, an issue exists as to whether the earthen ditches are well-constructed and maintained and conform to the conditions and customs of the locality where the water diversion occurs and is applied to beneficial use.”) (citing *Middlekamp*, 46 Colo. at 114-115) (emphasis added). Also see Colo. Found. for Water Ed., *supra* n. 29 at (stating that “Colorado water law requires reasonably efficient measures for diversion, conveyance and use. For example, Colorado law favors pipelines as a reasonable means to convey municipal water.... For agricultural uses, unlined irrigation canals and reservoirs – despite the seepage and evaporation they cause – are also considered reasonably efficient.”).

⁸⁵ *City of Colo. Springs v. Bender*, 148 Colo. 458, 465 (Colo. 1961) (holding that a senior appropriator would not be forced “to improve their extraction facilities beyond their economic reach.”); *Alamosa-La Jara Water Users Protection Ass’n v. Gould*, 674 P.2d 914, 935 (Colo. 1983) (holding that whether senior surface diversions amount to a reasonably efficient means of diversion must be considered “with proper regard for all significant factors, including environmental and economic concerns.”).

⁸⁶ Colo. Rev. Stat. § 37-92-502(2)(a) (LexisNexis 2011).

⁸⁷ Mark O’Meara, Utilities Dir., Town of Carbondale, personal communication with Sharon Clarke, Land & Water Conservation Specialist, Roaring Fork Conservancy (Aug. 31, 2011).

⁸⁸ For example, the General Assembly has prescribed specific water use standards for the construction and renovation of residential structures and facilities for human use within office, commercial, and industrial buildings, including hotels. Colo. Rev. Stat. § 9-1.3-102(3)-(4) (LexisNexis 2011). Likewise state law requires any construction and renovation by state agencies or local governments that includes the installation of plumbing fixtures to “utilize the best available approved devices for the purposes of conserving water.” Colo. Rev. Stat. § 9-1.3-105 (LexisNexis 2011). *See also* Colo. Rev. Stat. § 37-96-103(7) (LexisNexis 2011).

On a more comprehensive level, the General Assembly has also authorized the Colorado Examining Board of Plumbers to establish a Colorado Plumbing Code, which under a 2010 law (House Bill 10-1204) must now also address “conservation,” including “[w]ater-efficient devices and fixtures.” Colo. Rev. Stat. stands. 12-58-104.5 and 12-58-102(4) (LexisNexis 2011). Colo. H. Bill 10-1204, 67th Gen. Assembly, 2nd Reg. Sess. (Apr. 5, 2010). *See* Colo. Rev. Stat. stand. 12-58-102(4.5) (LexisNexis 2011). Under the law, “conservation” is defined as “efficiency measures that meet national guidelines and standards and are tested and approved by a nationally recognized testing laboratory.” *Id.* *See* Colo. Rev. Stat. stand. 12-58-102(4.5)(a) (LexisNexis 2011).

The comprehensive scope of state plumbing standards also indicates issues that the General Assembly has elected to leave to be addressed through free market forces. For example, the General Assembly requires all construction and renovation to conform to minimum requirements of the Colorado Plumbing Code, yet the term “plumbing,” as defined by statute, specifically excludes the repair, maintenance, and replacement of dishwashers, sinks, faucets, drains, showers, tubs and toilets. Colo. Rev. Stat. stand. 12-58-102(5)(a)(II) (LexisNexis 2011). In considering whether the water usage by municipal water customers was in fact wasteful, a water court would have to consider those aspects of customer water use for which a water provider lacks any specific authority to regulate.

With respect to outdoor water use for landscape irrigation, under the State Projects Water Conservation in Landscaping Act (1989), the General Assembly has established specific standards for water conservation in the landscaping built in conjunction with any new public project or facility built with state funds. Colo. Rev. Stat. § 37-96-101 to -103 (LexisNexis 2011). (Regarding the specific standards, *see id.* at -103(2), but note that even these standards are discretionary, and local governments need only “consider” the identified conservation goals. *Id.*) In light of this legislation, the General Assembly’s decision not to set conservation standards for private landscaping demonstrates a willingness to let requirements be developed at the local level, and to some degree, a complicit acceptance of conventional statewide M&I landscape irrigation practices. It is unlikely a water court would hold a water provider to water conservation standards that the General Assembly has elected not to require for private landscape irrigation.

Some state laws also mandate efficiency standards with respect to agricultural water diversions. For example, owners of irrigating and mill ditches are required to “carefully maintain and keep the embankments [of the ditch] in good repair. Colo. Rev. Stat. § 37-84-107 (LexisNexis 2011). Similarly, “a multiplicity of outlets” for irrigation ditches “shall at all times be avoided ... so far as practicable...” Colo. Rev. Stat. § 37-84-119 (LexisNexis 2011).

⁸⁹ *Pueblo W. Metro. Dist.*, 717 P.2d at 959 (internal citation omitted). *See also Ready Mixed Concrete Co.*, 115 P.3d at 646 (holding that “... a change of water right application reopens the prior decree for determination of the true measure of the appropriative water right’s consumptive use draw on the river system.”).

⁹⁰ Colo. Water Conserv. Bd., *Statewide Water Supply Initiative 2010*, App. L, “SWSI 2010 Municipal and Industrial Water Conservation Strategies,” 21-22 (Jan. 2011) (available at http://cwcb.state.co.us/water-management/water-supply-planning/Documents/SWSI2010/Appendix%20L_SWSI%202010%20Municipal%20and%20Industrial%20Water%20Conservation%20Strategies.pdf).

⁹¹ Reagan Waskom, ed., *Colo. Water*, 1 (Aug. 2010).

⁹² Colo. Water Conserv. Bd., *supra* n. 90 at 21.

⁹³ *Generally see* Water Research Found., “North America Residential Water Usage Trends Since 1992” (2010) (available at <http://waterrf.org/search/detail.aspx?Type=2&PID=4031&OID=4031>). *Also see* W. Resource Advoc., *Rushing Rivers Program: Feasibility Analysis of Application within the Colorado River Basin of Western Colorado*, § 1.2 (Jul. 2011).

⁹⁴ *Id.* (W. Resource Advoc.).

⁹⁵ See e.g., Dist. Court, Water Div. 5, Case No. 80CW61, “Findings of Fact, Conclusions of Law, Judgment and Decree,” ¶ 1 (recognizing the CWCB’s permissive license to use the Hunter Creek Flume and Pipeline water right, with the City of Aspen retaining ownership and the option to use the right).

⁹⁶ Colo. Water Conserv. Bd., *supra* n. 90 at 21.

⁹⁷ E.g., see Stacy Tellinghuisen, “Water Conservation = Energy Conservation,” W. Resource Advoc. (Jun. 30, 2009).

⁹⁸ Regarding State funding for implementation of water conservation plans, see Colo. Water Conserv. Bd., “Grant Guidelines for Water conservation implementation and public education and outreach projects” (2008) (available at <http://cwcb.state.co.us/LoansGrants/water-efficiency-grants/Documents/GrantGuidelines4ImplPubEdProjects.pdf>). Regarding Federal funding for water conservation programs, see e.g., Bur. of Reclamation, “WaterSMART Water and Energy Efficiency Grant Funding Opportunity Now Available” (Nov. 17, 2011) (available at <http://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=38383>).

⁹⁹ Ruedi Water & Power Auth., *supra* n. 16 at § 3.1.3 and Fig. 3.1.7, p. 13.

¹⁰⁰ *Id.*

¹⁰¹ See e.g., Dist. Court, Water Div. 5, Case No. 88CW421, *Concerning the application for water rights of the Town of Carbondale, in Garfield and Pitkin Counties*, “Findings of Fact, Conclusions of Law, and Judgment and Decree of the Water Judge” (Jun. 2, 1994).

¹⁰² See e.g., Dist. Court, Water Div. 5, Case No. 93CW319, *Concerning the application for alternate points of diversion and plan for augmentation of the Basalt Water Conservancy District in Garfield, Pitkin and Eagle Counties, Colorado*, “Final Judgment and Decree” (Jul. 30, 1998) (decreeing the use of the Robinson Ditch, a former agricultural water right on the Roaring Fork River, for augmentation purposes).

¹⁰³ See e.g., Dist. Court, Water Div. 5, Case No. 05CW50, *Concerning the application for water rights for Red Butte Ranch Homeowners Association and RBR12, LLC in Pitkin County*, “Findings of Fact, Conclusions of Law and Judgment and Decree of Water Court” (Dec. 4, 2007). Also see Water Court, Div. No. 5, Case No. 98CW291, *In the application for water rights for Woody Creek Ventures, LLC, in Pitkin County*, “Ruling of the Referee” (Jun. 24, 2002).

¹⁰⁴ See e.g., City of Aspen, “Water Conservation Element – Water Management Plan,” 6 (Nov. 1996) (noting that “The net difference between the amount [of water] applied from irrigation and evapotranspiration generally comes back to area streams as return flows. Because of a delay factor in the water returning through alluvial groundwater to the stream and because peak diversions generally occur in July when surface flows are readily available, these return flows significantly contribute to maintaining base flow in the late summer when availability is critical.”)

¹⁰⁵ See Chrissy Sloan, “The effect of the Shoshone and Cameo calls on the Roaring Fork Watershed,” Roaring Fork Conservancy, 5-10 (Dec. 2004) (available at www.roaringfork.org/images/other/shoshone.pdf).

¹⁰⁶ Dist. Court, Garfield Co., Civil Action No. 2283, *In the matter of the application of the Town of Carbondale*, “Findings and Decree” (Nov. 6, 1922).

¹⁰⁷ See Ruedi Water & Power Auth., *supra* n. 16 at App. 3.1.3.

¹⁰⁸ *Id.* at § 4.1.3, p. 15.

¹⁰⁹ Generally see Megdal, S.B. and J.B. Nadeau, “Projects to enhance Arizona’s environment: Piloting a voluntary mechanism for securing water for environmental enhancement projects, Phase III report,” Water Resources Research Ctr., Univ. of Ariz. (Jan. 2010).

¹¹⁰ *Id.* at 4-5.

¹¹¹ *Id.*

¹¹² *Id.*

¹¹³ *Id.* at 5.

¹¹⁴ Sharon Clarke, Land & Water Conservation Specialist, Roaring Fork Conservancy, email to author (Nov. 20, 2011).

¹¹⁵ *Id.*

¹¹⁶ Generally see W. Resource Advoc., *supra* n. 93.

¹¹⁷ *Id.* at §§ 1.1 and 2.1.

¹¹⁸ *Id.* at § 1.2.

¹¹⁹ *Id.* at tabl. 3-1.

¹²⁰ *Id.*

¹²¹ *Id.*

¹²² Colo. Water Consev. Bd. and City of Aspen, “Intergovernmental Agreement” (Mar. 10, 1998) (available at <http://cwcbweblink.state.co.us/weblink/0/doc/129454/Page1.aspx?searchid=ad799f99-c0e5-49b4-a66c-f37e2b55c3f7>).

¹²³ *Id.* at ¶¶ 6, 8, and 10.

¹²⁴ Ruedi Water & Power Auth., *supra* n. 16 at §§ 4.1.2, p. 9 and 4.1.3, p. 17.

¹²⁵ Colo. Water Consev. Bd. and City of Aspen, *supra* n. 122 at ¶¶ 8 and 10.

Appendix I

Frequently Asked Questions for Municipal Water Conservation

- 1. If my customers use less water as a result of a concerted effort to conservation water, does my utility jeopardize its water rights as a result of “abandonment”?**

No, a municipal water supplier’s water rights will not be in danger of abandonment if the utility has a qualified water conservation plan in place. Under legislation enacted in 2005 (Senate Bill 133), water right owners are protected from abandonment for any nonuse of their water rights resulting from conservation efforts undertaken in accordance with a water conservation program either approved by a state agency, a water conservation, or conservancy district, or established through formal written action or ordinance by a municipality or municipal water supplier.

- 2. If my customers reduce their water use through conservation efforts can local streamflows be benefited?**

Yes. To the extent a water user reduces their diversions, the bypassed water will remain in the stream until its diverted by the next downstream appropriator with water rights that are in priority. But conservation efforts may also allow a utility to contract their water rights (or a portion thereof) to the Colorado Water Conservation Board for the purpose of maintaining instream flows in a specific stream reach in order to preserve and improve the natural environment. The CWCB can acquire senior water rights for instream flow purposes, which may require formally changing or adding to the decreed type and place of use in water court.

- 3. Can my utility transfers water rights to the CWCB’s Instream Flow Program and still retain ownership and potential use of the rights, should the need arise?**

The CWCB can acquire water rights through various contractual arrangements, including a trust agreement or permissive use license. The CWCB has agreed to a number of ISF acquisitions that allow municipal utilities to retain ownership and the ability to reclaim the subject water rights for municipal use should the need arise, such as during a drought.

- 4. If my utility wants to contract conserved water to the CWCB for ISF purposes, how much water can potentially be transferred in water court?**

The amount of water available to transfer in a change decree proceeding for absolute water rights is not the amount originally decreed to the water right, but rather measured according to the actual

beneficial use historically accomplished under the right. Unless the issue of historical beneficial use was recently adjudicated in a similar case, the applicant for a change decree must produce a record of historical beneficial diversions and consumptive use of the water right to be changed, from which a water court will recognize specific values based upon a representative period of years. There are two ways to measure the historical use of a water right for change decree purposes: historical consumptive use and historical diversions.

In seeking a change decree for ISF use of an absolute water rights, the CWCB often claims credit for both the historical diversions and historical consumptive use attributed to the right. A reduction in current or foregoing diversions over historical rates can be used for ISF purposes in the stream reach between the originally decreed point of diversion and the historical point of return flows, and a similar reduction in consumptive use can be used for ISF purposes downstream from the historical point of return flows. Therefore, conservation efforts that reduce the current or foregoing use of a water right in relation to either historical consumptive use or historical diversions could potentially serve as the basis for an ISF acquisition by the CWCB.

5. What steps does my utility need to take before transferring a water right to the CWCB's Instream Flow Program?

A municipal utility should start with establishing a water conservation program, either one approved by the CWCB or formally established by formal written action or ordinance. A water conservation plan approved or established accordingly protects a utility's water rights from claims of abandonment (under Senate Bill 133, as described above).

A municipal water provider will also require a long-term integrated water supply plan in order to determine the extent to which its rights are available for contracting to the CWCB's Instream Flow Program, based on projected future water demands.

Finally, prior to any action on the ground, a water provider intending to engage in this kind of water conservation campaign should also seek the opinion of a qualified engineer as to how the amount of historical beneficial use attributed to their water rights may be affected. In general, water conservation efforts intended to benefit the environment should be designed to prevent a prolonged period of reduced use prior to obtaining a change decree for ISF use of the corresponding water rights.

6. If my utility decides to leave a portion of our water rights in stream, but does not want to go to water court to adjudicate a change of use to allow for ISF use, is the water protected from junior appropriators?

No, unless legally transferred to another beneficial use, bypassed water is available for use by other appropriators according to their decreed priorities. The degree and extent of streamflow benefits will depend on the how specifically municipal diversions relate to other downstream diverters. In some cases, there may not be any other significant water rights on the stream for a reasonable distance and bypassed water can have a meaningful benefit to local streamflows. In other cases, the distance between a utility's diversions and the next downstream in-priority diversion may be short. The character and effect of downstream diversions is an important consideration in deciding if your utility wants to attempt to transfer the unused portion of its water rights to the CWCB for ISF purposes.

But so long as a municipal water utility has a qualified water conservation plan in place (as described above, in question 1), it need not worry about conservation efforts giving rise to claims of abandonment. If at some point in the future your utility once again needs to use your entire water right, you will be free to increase its diversion up to the full decreed amount of your water right, subject to the exercise of other senior water rights.

7. Given that the recent legal protections against abandonment, are there any lingering legal concerns associated with municipal water conservation efforts?

Yes, there are two important lingering legal concerns with respect water conservation efforts by any water user in Colorado. First, there is the possibility that if a water user implements conservation efforts that gradually reduce their water demands and then attempts to legally transfer the unused portion of its water rights to another beneficial use (such as ISF purposes), the period of reduced use may be factored into the historical beneficial use attributed to the subject water rights in a change decree proceeding. Thus conservation efforts could ultimately diminish the amount of water that is potentially available to transfer to another beneficial use in a change decree proceeding. To avoid this result, conservation efforts should be designed to prevent a prolonged period of reduced use prior to filing a change decree for an alternative use of the right in question.

Another concern is the potential for opponents to a proposed change decree to raise claims that water conservation "savings" represent water that was previously "wasted." A water court will necessarily exclude any prior use it deems wasteful from the calculation of historical beneficial use. Whether an appropriator's practices meet the required legal standard for beneficial use (i.e., "reasonable efficiency") is a question of fact gauged according to prevailing local customs and practices. While appropriators should necessarily curtail any wasteful water use that occurs under their water rights, such reductions must be distinguished from reductions of otherwise reasonable water use that can potentially be transferred to other beneficial uses, including to the CWCB for ISF purposes.