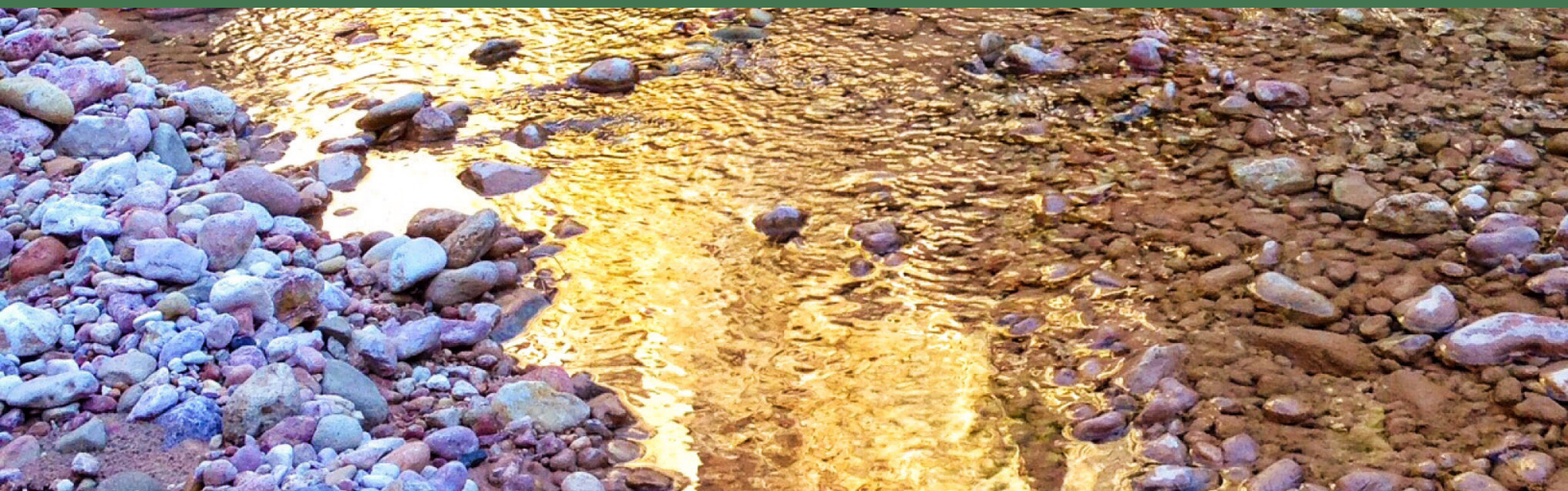
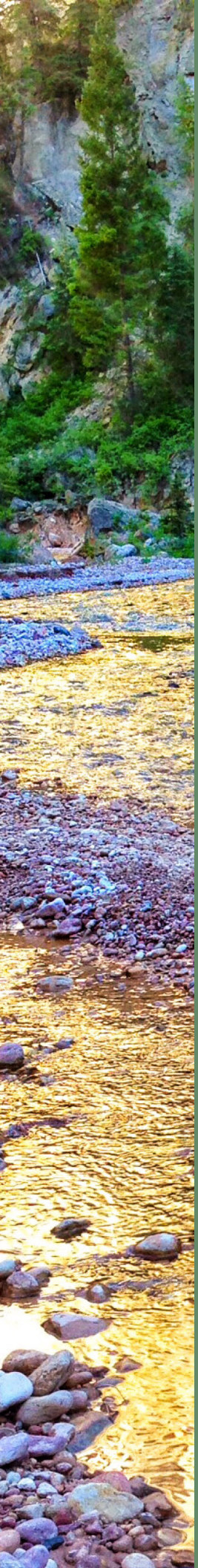
Water Conservation





WATER CONSERVATION

Introduction

The Utah legislature revised a bill in 2019 requiring water agencies with more than 500 service connections to submit a water conservation plan to the Utah Division of Water Resources. The plans are to be updated every five years. This water conservation plan is prepared to meet the Utah Board of Water Resources requirements and to address the goals of the Central Iron County Water Conservancy District (CICWCD). Water conservation is a key element to provide for CICWCD's future water needs. Conservation can delay the need for expensive water projects, preserve the environment, and save taxpayers money.

The District's water consumption was divided into residential connections and bulk connections. In the year 2019, the total residential usage for the District was 149,859,584 gallons and the District used 7,905,000 gallons for 2 wholesale/bulk-water connections. On average, the existing water system delivers 312 gallons per day (gpd) per residential connection and the average per person usage is 86 gpd per person.[1] The District and Key Stakeholders deliver an average 262 gallons per capita per day (gpcd).[2] This amount exceeds the states average in 2015 of 240 gpcd by 22 gpcd. Water consumption in Cedar Valley has reduced by 18% since 1995.

The purpose of this plan is to present a planning document for the District, which will guide its water conservation activities for the future to meet the State's Regional Water Conservation goals of 19% consumption reduction by 2030, 24% reduction by 2040, and 28% reduction by 2065 for the Lower Colorado River North Region.[3] Water conservation will benefit the District, the users, and the environment. The possible benefits include:

- Improved water service and more effective use of available water supply.
- Reduced Operation and Maintenance (O & M) costs, including lowering pumping costs.
- Development of additional water supply capabilities and diminished groundwater overdraft.
- Postponed need for new or expanded water supplies and infrastructure.
- Reduced impact of drought.
- Reduced indoor water use translates into reduced wastewater flow, which results in reduces O & M costs of Wastewater treatment facilities.
- Investigate water re-use options.

It is important to mention here that conservation can suppress water sales and lower water revenues. The revenue loss impacts can be mitigated by periodic rate adjustments if reduction occurs slowly. These adjustments would be handled similarly to operating cost increases and can be integrated into financial planning.

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1 This value is calculated from residential connections only.
2 See Financial Business Plan & Water Needs Assessment - Carollo Engineers, Inc.
3 See Utah's Regional M&I Water Conservation Goals: November 2019

Description of CICWCD Water System

CICWCD's existing water delivery system is functioning and currently delivers quality culinary water to all of its 1,221 connections (1,217 single connections and 4 wholesale/ bulk-water connections; 4,860 people). The existing system functions and serves all connections with pressures in accordance with state requirements.

CICWCD currently owns 2,390 acre-feet of water rights and an additional 30,000 acre-feet for recharge in the Cedar Valley (Basin 73). They own 85 acre-feet in Chekshani (Basin 81) and 320 acre-feet in Beryl/Enterprise (Basin 71). In 2019, the court decreed 15,000 acre-feet in Pine Valley (Basin 14) & 11,275 acre-feet in Wah Wah Valley (Basin 69), totaling 26,275 acre-feet. Reference *Figure 6 CICWCD Water Rights*.

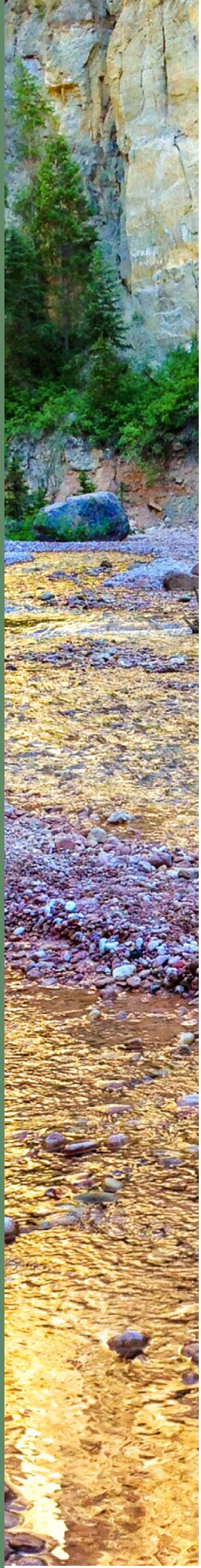
Currently, based on 2019 usage, the District is using almost 459.91 acre-feet of residential water annually (431.76 acre-feet in central system; 20.40 acre-feet for Chekshani Cliffs; and 7.75 acre-feet for Cedar Highlands), with a total of 1,497 Equivalent Residential Connections or ERCs (1,345 ERCs in central system; 64 ERCs in Chekshani Cliffs; 88 ERCs in Cedar Highlands) on the system.

The state water source requirement is that a water system be able to produce enough water for indoor and outdoor use. Currently the District exceeds the state water source requirement by 424 gallons per minute (gpm) for the central system; 94 gpm for Chekshani Cliffs; and 27 gpm for Cedar Highlands. No additional sources need to be developed in order to meet this requirement but as growth continues, and the development of the mine increases, the CICWCD should investigate new sources for the central system.

> Did you know? Iron County's GPCD is 223, which is the 3rd lowest county water usage in the State.

The CICWCD water system has four springs and seven culinary wells to meet the peak day demand requirement. Reference *Existing System Section* which shows each well and spring with its source capacity. Source capacities were given by the current water operator. The total capacity of the springs and wells are 2,235 gpm.

Population within the CICWCD boundary experiences an average of 10.1% growth annually. Implementing the existing 1,207 residential connections with a 10.1% growth rate, by the year 2050 CICWCD will have an estimated 23,598 residential connections. This growth will require the District to increases source capacity for indoor usage to 13,110 gpm and 19,999 gpm for irrigation use totaling 33,109 gpm. [1] Goals and practices to reduce this amount will be discussed in this section.



1 This total amount does not take in any estimates for bulk connections.

Water Conservation Initiatives

Water usage within the CICWCD is primarily outdoors in the spring, summer and fall periods. Water conservation efforts by the CICWCD are therefore primarily focused on reductions in outdoor water usage. There are four different groups of water users (agriculture, public entities, businesses and residential) that use water outdoors and require different efforts to encourage reductions in water usage. CICWCD will focus its water conservation efforts on the last three groups in the order of their outdoor water usage starting with public entities and work down to individual residential users.

The majority of water, approximately 75%, used within CICWCD's service area is used for agriculture. Agricultural water users are not directly controlled by nor obtain their water from CICWCD. They use the majority of surface water within CICWCD in addition to pump water from the same aquifer that supplies water to the other three groups identified above. Current state laws governing agricultural water rights have no incentives to promote water conservation by agriculture. The CICWCD will continue to work with state extension offices to educate and encourage responsible water usage by agricultural users but has no direct control over this water usage. As the role of agriculture within CICWCD diminishes due to land acquisition for non-agricultural use, CICWCD will have more impact and ability to control water usage for these new non-agricultural uses via water prices and usage regulations.

The most effective method of promoting water conservation for individual residential users is a combination of water cost and education on water conservation measures. CICWCD encourages water conservation by using a tiered rate structure that makes water more expensive as more water is used by the consumer. The municipal water systems use this same type of tiered system. Rates must be adjusted as needed to ensure they reflect the actual cost of water delivery and system upkeep. CICWCD should educate the public on best practices for the effective use of our limited water resources. Continual education programs supported by CICWCD are in place to increase awareness of the importance of water conservation and educate the public on best practices for the effective use of our limited water resources. CICWCD urges the community to remove turf, install water efficient appliances, and participate in water conservation programs.

CICWCD has purchased modern irrigation controller for two parks within Cedar City and one in the Iron County School District at Three Peaks Elementary School. Water audits were conducted after the new controller were installed and CICWCD will compare water usage before and after to demonstrate to Cedar City and the Iron County School District how these improvements will pay back their investment in new controllers in a short period of time as well as save water in the future. Usage data for before and after the controllers are implemented is available for comparison from the Utah State University (USU) Iron County Extension. The District has also

encouraged the public entities to certify their key outdoor maintenance personnel under the Qualified Water Efficient Landscaper (QWEL) program. This program trains personnel to effectively design water application programs and monitor their use in outdoor applications.

Businesses require a slightly different approach for water conservation as a tenant, landlord and a landscape company could all be involved in the outdoor water usage at a particular business. The CICWCD intends to formulate programs to reach out to business tenant and landlords to encourage their active participation in the outdoor water use in their business or property. Free water audits can serve as a catalyst for discussions on wasted water, public image, and more efficient outdoor irrigation programs. Recommendation to use landscape maintenance companies that have certified Qualified Water Efficient Landscaper (QWEL) personnel will be made to these users and well as encouragement for local landscape companies to have staff personnel certified under the QWEL Program. Recommendations for upgrading to current state of the art irrigation controllers will be made where appropriate. CICWCD will investigate the feasibility of funding a rebate program to encourage this upgrade to more efficient irrigation controllers.

Water conservation is an ongoing effort and CICWCD will continue the above programs and add new ones as the need arises and new information is made available. Additional areas that can be explored include: encouragement to municipalities to ensure their building codes reflect water conservation ideals, turf maintenance programs that promote water efficiency, promotion of xeriscape landscaping for both new construction and remodeling, secondary water programs and other ideas to reuse water.

Residential Conservation Goals

The District can reduce per capita consumption by promoting and expanding water conservation. Currently there are many homes that do not have landscaping, but as landscaping is added water consumption per capita will increase substantially. As conservation goals and standards are integrated within the District, increase in per capita consumption can be avoided.

The State of Utah has proposed a goal to reduce the per capita water demand of the public systems throughout specific regions. The CICWCD service boundary is within the Lower Colorado River North region. The goals proposed by the state are: 19% reduction by 2030, 24% reduction by 2040, and 28% reduction by 2065.[1] To achieve this CICWCD proposes several conservation goals:

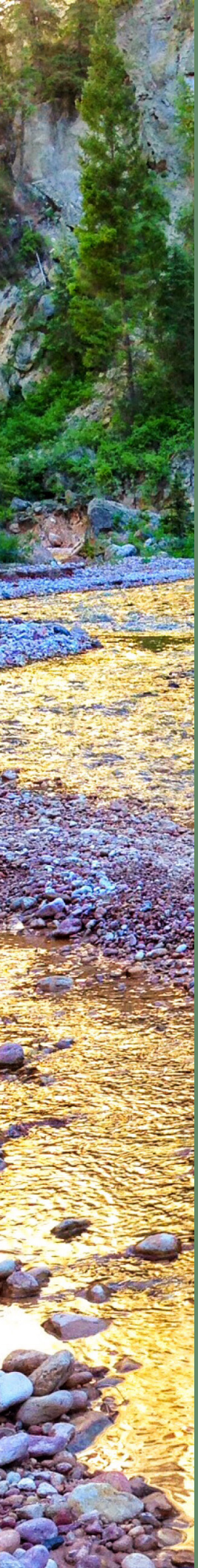
1. Reduce current consumption to 231 gpd per capita by the year 2030—a 19% reduction from the 2015 baseline. Water use in the District will increase as more residents add landscaping to their yard and as more commercial and industrial users connect to the system. CICWCD will have to introduce strict outdoor conservation measures and education to meet the states goals in the future.

2. Maintain a financially viable water system by adopting a conservation-oriented rate structure. A conservation-oriented rate structure will have the largest effect on conservation because as greater water usage becomes more expensive it encourages users to be conscientious of their use.

3. Promote xeriscaping or Localscaping for landscapes, open spaces and yards: Improved irrigation practices and water efficient landscaping can enhance the appearance of the District.

CICWCD has implemented processes to achieve the State's consumption reduction goals. These include but are not limited to water rate structure adjustments, the formation of a conservation advisory board that includes many volunteers from the surrounding communities, and community outreach and training.

1 See Utah's Regional M&I Water Conservation Goals: November 2019



Water Conservation Process

Water Rate Structure

In June of 2018, the CICWCD Board passed a resolution, Resolution No. 2018-6-21-01 Water Right Exchange Rates, to adjust and increase the water rate structure. The new water rate structure will increase revenue as well as promote water conservation for high water users. Prior to the resolution, developers were required to bring in 1 acre-feet of water rights when connecting to the water system. Now, developers have an additional option: to bring in 0.8, 0.7, or 0.6 acre-feet in exchange for an adjusted conservation billing rate. This new conservation rate structure promotes water conservation by restricting the lawn size within the Subdvision's Codes, Covenenants & Restrictions. *Table 13 Conservation Rate Structure* shows the water rate structure that was passed in 2018. The price per 1,000 gallons is the same for each rate; what varies is the number of gallons each level includes.

Table 13 Conservation Rate Structure

			Conservation Rate		
		Standard	0.8 acre-feet	0.7 acre-feet	0.6 acre-feet
	Rate	Gallons Included per Month	Gallons Included per Month	Gallons Included per Month	Gallons Included per Month
Base Rate	$31.00	No Water	No Water	No Water	No Water
Level 1	$0.78/1,000 gallons	0~12,000	0~9,600	0~8,400	0~7,000
Level 2	$0.94/1,000 gallons	12,001-20,000	9,601-16,000	8,401-14,000	7,001-12,000
Level 3	$1.65/1,000 gallons	20,001-30,000	16,001-24,000	14,001-21,000	12,001-18,000
Level 4	$2.78/1,000 gallons	30,001-60,000	24,001-48,000	21,001-42,000	18,001-36,000
Level 5	$3.09/1,000 gallons	60,001-100,000	48,001-80,000	42,001-70,000	36,001-60,000
Level 6	$4.12/1,000 gallons	100,001+	80,001+	70,001+	60,001+
			Conservation Rate Lawn Restrictions (not to exceed)		
			3,500 sq. ft.	2,500 sq. ft.	1,500 sq. ft.

Water Meter Reading and Billing

All individual water connections are metered. CICWCD currently reads meters monthly and bills monthly to customers.

CICWCD Water Conservation Advisory Committee

In 2014, the CICWCD Board created a Water Conservation Advisory Committee. The mission of this board is to promote and educate the public about water conservation initiatives. The advisory board includes members in the community who have interests in conservation, staff of the school district and local municipalities, and local experts on water conservation.

Artificial Recharge Projects

Artificial recharge is the process of spreading or impounding water on the land to increase the infiltration through the soil and percolation to the aquifer. The process Recharge is used to manage excess runoff-water, prevent flooding and downstream erosion, and improve water quality. The District has been involved in many recharge projects including: Quichapa Recharge, Western Rock Recharge, Schmidt Pit Recharge, Airport Recharge, Horse Alley Recharge, and Enoch Graben Recharge. The recharge amounts are metered and live flow data can be found on the District website: cicwcd.org.

Quichapa Recharge Project

The Quichapa Recharge Project is one of the most complex of the recharge facilities in Cedar Valley. In 2017, the District, in conjunction with Cedar City, Iron County, and local property owners, broke ground on this project. The water is first diverted from coal creek into a settling area which feeds into the "lazy river". The "lazy river" was designed so that the dirt and other substances in the water can settle and not be taken downstream. After, it moves through the lazy river, it is pumped to a settling basin where it is able to seep into the ground, or it can be diverted to an agricultural operation and used for irrigation.

Western Rock Recharge

Many of the recharge projects are located in old gravel pits. The old Western Rock gravel pit is one of the largest of the gravel pits in the Cedar Valley. During the high spring runoff of 2019, it is estimated that 6,000 acre-feet was added to the aquifer at Western Rock.

Schmidt Pit Recharge

The Schmidt Pit is also an old gravel pit located near the Western Rock Pit. A diversion structure and monitoring system was installed in 2018 to divert water during winter run off. The Schmidt Pit is the primary recharge location during the winter.

Airport Recharge Facility

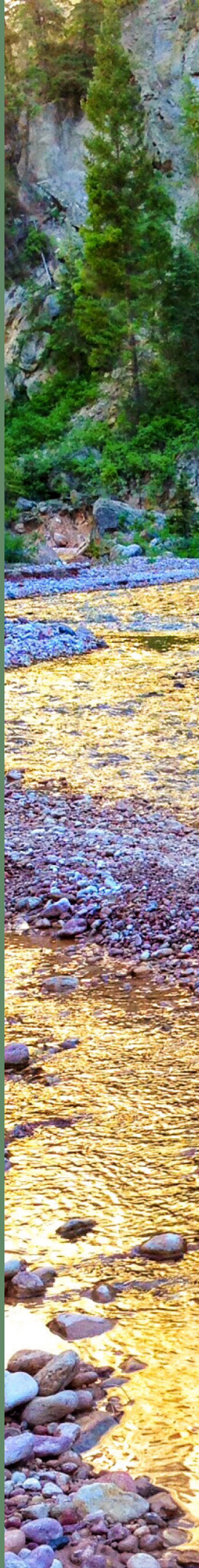
Cedar City is the creator of the Airport Recharge Facility. Throughout the years, thousands of acre-feet of water have been added into the Airport Recharge Facility. The recharge pit covers approximately 5 acres of land within the Cedar City Regional Airport.

Horse Alley Recharge

CICWCD in cooperation with Cedar City utilized an area where fill was taken to make improvements to the airport runway. It is estimated to cover approximately 3 acres of land and up to 6 feet deep. A discharge was constructed to allow excess water to pass through and continue to irrigators and other recharge projects.

Enoch Graben Recharge

The area of recharge is where springs used to flow. The springs have dried up due to ground water pumping of the aquifer. This project was made possible with the help of the Worth Grimshaw Family and Enoch City



Areas of Concentration

1.Explore ideas to encourage water conservation within the agricultural community.

   a. In 2018, the CICWCD received a grant from the Legislature to assist in the retrofitting of Agricultural Producer's Center Pivot System to water efficient LEPA/LESA spray application nozzles. Through this grant, approximately 2,000 acres of farmland was converted to water efficient irrigation systems.

2. Provide awareness to the community that the Utah Division of Water Rights has proposed a draft Groundwater Management Plan that will gradually reduce water rights in the Cedar City Valley to safe yield of 21,000 acre-feet.

3. Help Cedar City and Enoch construct a reuse system for the WasteWater Treatment Plant.

4. Contact large non-agricultural outdoor water users (Cedar City, Enoch City, Southern Utah University, Iron County School District, and churches) to determine what water conservation activities are in place and what improvements can be made.

   a. Review city ordinances on landscape requirements and suggest changes as necessary to promote water conservation.

5. Involve the community by holding annual water events. These will preferably be sponsored events where CICWCD will educate and promote water conservation within the community.

   a. CICWCD holds an annual community Water Festival to promote water conservation and educate the community on the importance of water.

   b. CICWCD has implemented an annual Fourth Grade Water Fair for students in the Iron County School District in coordination with the USU Extension Office.

6. Promote water-wise landscaping methods, such as xeriscaping and Localscapes.

   a. The CICWCD became a Localscapes partner in September 2019 and began holding yearly classes for the community in March 2020.

7. Expand promotion of programs such as Utah's Choice, Water Wise Plants, Slow the Flow, Utah Water Savers and WaterSense. CICWCD should also promote, research, and evaluate successful water conservation programs that have been implemented in other western communities.

   a. Utah Water Savers currently provides rebates in the Cedar Valley area for Smart Irrigation Controllers and WaterSense Toilet replacements.

   b. Work with local nurseries and garden centers to promote the Water Wise Plants program and plants that are adapted for our area and climate zone.

8. Construct an Outdoor Irrigation Usage Audit form to assist users in quantifying the existing system configuration and areas that can be improved for water conservation.

   a. CICWCD currently partners with Utah State University Extension to conduct lawn irrigation system water checks for Iron County residents.

9. Contact the Iron County Home Builders Association to determine their policies and guidance to contractors on water conservation programs in new construction homes and provide training and assistance in formulation of a strong water conservation policy for new construction homes.

    a. Promote the use of the CICWCD Water Right Exchange Rates which restricts lawn sizes.

10. Apply for Department of the Interior Bureau of Reclamation matching Grants under the WaterSmart program:

    a. Water and Energy Efficiency Grants – For projects that save water, improve energy efficiency, address endangered species and other environmental issues, and facilitate transfers to new uses.

    b. Title XVI – Water Reclamation & Reuse Program - Title XVI of P.L. 102-575, as amended (Title XVI), provides authority for Reclamation's water recycling and reuse program, titled "Title XVI." Through the Title XVI program, Reclamation identifies and investigates opportunities to reclaim and reuse wastewaters and naturally impaired ground and surface water in the 17 Western States and Hawaii. Title XVI is budgeted for by Reclamation's regional offices and includes funding for planning studies and the construction of water recycling projects, on a project specific basis, in partnership with local governmental entities.

    c. System Optimization Review Grants – A System Optimization Review is a broad look at system-wide efficiency focused on improving efficiency and operations of a water delivery system, water district, or water basin. The Review results in a plan of action that focuses on improving efficiency and operations on a regional and basin perspective.

    d. Advanced Water Treatment and Pilot and Demonstration Project Grants – For pilot and demonstration projects that address the technical, economic, and environmental viability of treating and using brackish groundwater, seawater, impaired waters, or otherwise creating new water supplies within a specific locale.

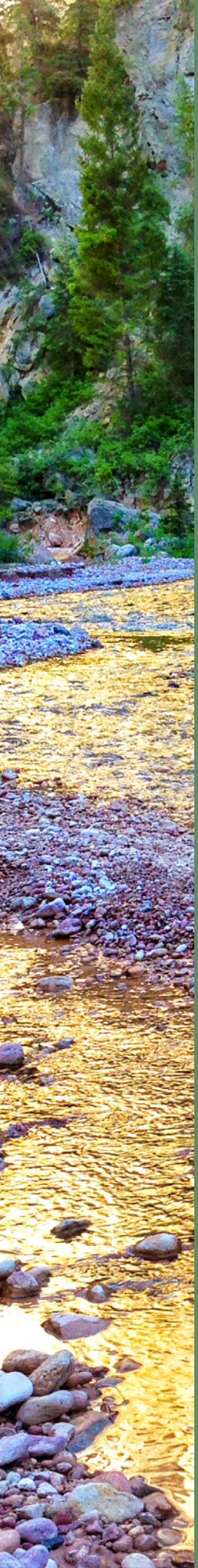
    e. Basin Studies - Basin Studies addresses basin-wide efforts to evaluate and address the impacts of climate change. Funding is available for comprehensive water studies that define options for meeting future water demands in river basins in the western United States where imbalances in water supply and demand exist or are projected.

11. Improve CICWCD web page on Water Conservation.

12. Development of Consumer information and rebate programs to promote outdoor water conservation.

    a. Landscape Irrigation Certification Rebates – rebates to cover part of the certification cost for landscape Irrigation through the Irrigation Association (IA):

        i. Certified Irrigation Contractor - install, maintain, and repair irrigation systems.



ii. Certified Irrigation Designer - establish specifications and design drawings for irrigation projects. IA certifies irrigation designers in six specialties. Landscape/turf specialties include commercial, golf course and residential irrigation; agriculture specialties include sprinkler, surface, and drip-micro irrigation.

iii. Certified Landscape Irrigation Auditor - gather irrigation water-use data and test landscape irrigation systems.

iv. Certified Landscape Water Manager - evaluate, operate, manage, and improve landscape irrigation systems to achieve the highest level of water conservation possible.

v. Qualified Water Efficient Landscaper (QWEL) - The Qualified Water-Efficient Landscaper (QWEL) program provides twenty hours of educational materials designed to provide a better understanding of landscape water management for the landscape industry.

13. Explore ideas for water reuse and recycling such as Rainwater Harvesting.

Linking With Useful Internet Sites

CICWCD created a website that is used for posting monthly District-wide water consumption, recommended lawn-watering rates and times, and other water conservation-related information. The District's website will display links to the following useful sites, which District residents could visit to learn about different strategies for water conservation.

- (http://www.conservewater.utah.gov): Utah Division of Water Resources site.
- (www.watereducation.utah.gov/): Sites for Water Conservation for Kids
- (http://www.awra.org): The American Water Resources District is an excellent source of water-related information and literature.
- (http://www.waterlink.co.uk): British website for scrutinizing every detail of water consumption, and water auditing.
- (http://extension.usu.edu/): There are drought resistant and water conserving plants listed on this website.
- (http://www.epa.gov/watersense): How to Conserve Water and Use It Effectively (EPA).
- (https://localscapes.com/): Utah website introducing Localscapes lawn care.
- (https://slowtheflow.org): How to conserve water.
- (https://utahwatersaver.com): Website for water rebate programs for Utah.
- (https://cwel.usu.edu/irrigation): Center for water-efficient landscaping website.