



COLORADO
WATER CONGRESS
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Demystifying Colorado
Water for Legislators –

“201” Level
Municipal Water
Efficiency, Growth
and Affordability

April 12, 2023



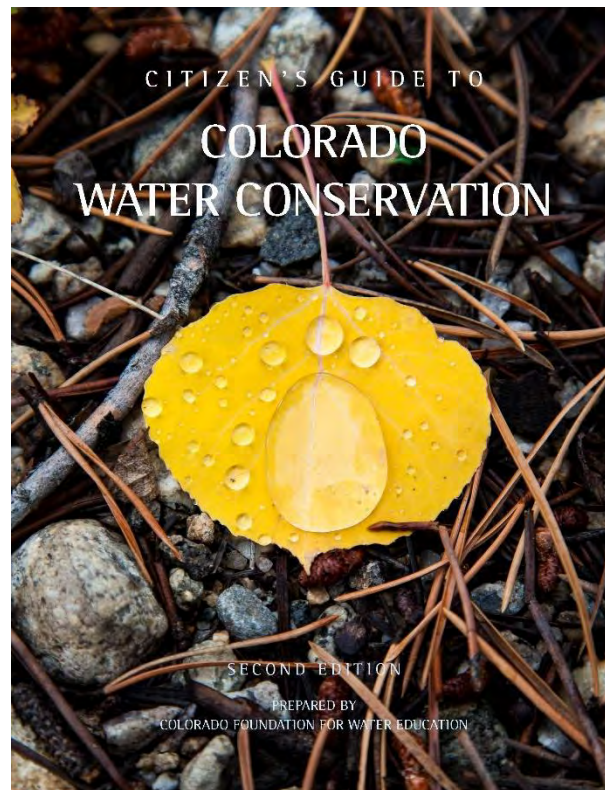
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COLORADO WATER CONGRESS
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Related Resources (available at wateredco.org)



FACT SHEET
Colorado's Conservation Policies

Natural constraints limit Colorado's water supplies. A limited and varying amount of water is available each year that quantity could become even more stretched in the future. According to the 2019 Technical Update to the Colorado Water Plan, municipal and industrial water uses account for about 10% of overall statewide water demand. While many communities across the state have been successful in driving down individual per-capita water use, population growth is projected to drive an increase in overall statewide municipal water demand by 35% by 2050. To continue stretching scarce supplies, policy makers, water providers and residents are adjusting the way they use and consume water through advanced conservation goals, practices, policies and regulations.

Do Colorado's conservation policies go far enough?

In the 2019 report *State Level Water Efficiency and Conservation Uses in the Colorado River Basin* from the Alliance for Water Efficiency, Colorado earned a B grade for its efficiency and conservation laws. The report also ranked Colorado 16th of all 50 states and all of the 2020 Colorado River Basin states, meaning that its conservation and efficiency laws are more stringent than in some parts of the country, but not every part.

Recent Colorado conservation policies

H20-1099 requires local government water plans that contain a water supply element to include water conservation policies.

H20-1090 says that, "restrictive constraints can't exist on property owners from using an escape or drought-tolerant plants in common element properties for which the owner is responsible for landscaping. Previously this applied just to common interest communities, such as homeowners' associations."

H20-1251 updates water and energy efficiency standards for certain products, including low-flow showerheads that meet new standards apply to new products sold in Colorado.

H20-1066 "will...incentive...to visiting weekly again in Colorado, allowing the action of precipitation off of residential rooftops through tree canopies with a combined capacity of one gallon or less."

2019 Colorado Water Plan set the goal of achieving 400,000 acre feet of new water conservation savings statewide each year.

H20-1044 authorized the Colorado Department of Public Health and Environment to develop regulations to ensure the safe use of greywater and allowed local governments to use those regulations to encourage water use in their regions.

H20-1051 required water providers to set an annual conservation water demand goal to report water use and conservation data to be used for statewide water planning. That data is available through the Colorado Water Conservation Boards Water Efficiency Data Portal.

While Colorado's policies were highly rated for financial assistance, water conservation plan requirements, plumbing fittings and appliance standards, and building codes, the report found that Colorado could "have stronger water standards through their requirements, water conservation connected to water supplier permits, technical assistance, and marketing and billing."

Alliance for Water Efficiency Report Card

STATE	PLUMBING	LAWS	MARKETING
Arizona	A	B	B
California	A	A	A
Colorado	B	B	B
Florida	B	C	B
Illinois	C	B	B
Michigan	C	B	B
Minnesota	C	B	B
Washington	A	B	A

FACT SHEET
Local Water Conservation Tools

Colorado water utilities and other providers work to ensure there's sufficient clean water to meet the needs of their communities without interruption. That includes during drought, low-water years, or times of water quality disturbance when certain water sources are unusable. Because of the state's growing population, efficient water use and conservation efforts allow water providers to further stretch their limited water supplies. Some have implemented permanent water-reducing policies and programs while others push harder for water conservation during drought. Strategies range from low use and zoning policies to conservation-encouraging water rates and rebates to educational programming.

Municipal water is used for many different purposes: drinking, sanitation, landscape irrigation, as well as for fire protection and to supply public facilities and businesses. In Colorado homes, while landscape irrigation historically accounted for more than half of annual domestic water use, overall household water use has moved toward a division of 60% indoor use and 40% outdoor. Even so, residential indoor water demand has increased throughout much of the state recently, largely due to advancements in technology like water-saving fixtures and appliances, according to the 2019 Technical Update to the Colorado Water Plan.

Colorado Municipal Water Use, 2015

Some water utilities update the Colorado Water Plan and 40% outdoor. Even so, residential indoor water demand has increased throughout much of the state recently, largely due to advancements in technology like water-saving fixtures and appliances, according to the 2019 Technical Update to the Colorado Water Plan.

Water providers and municipalities encourage conservation

Best practices can incentivize and result in water conservation and efficiency. Although many must be implemented by homeowners and business owners, water providers and governments often use a mix of these tools to promote conservation.

FINANCIAL ASSISTANCE AND INCENTIVES
Financial incentives to foster conservation can include rebates for efficient plumbing fixtures, appliances and appliances, faucets, toilets and replacement water-saving plants and trees. They can also include rebates for water-saving devices such as smart meters or smart irrigation systems, where charges escalate as more water is used. Some rebates target businesses, such as those for water providers and customers can better understand and improve their water usage. Water use efficiency mapping is used to identify a municipality's cost-efficient customers and target them with rebates, education and other incentives.

EDUCATION AND TECHNICAL ASSISTANCE
Public education efforts raise awareness and foster water-saving behaviors. These include in-schoolroom programs, water fountains, marketing campaigns, technical water use efficiency mapping, at-home irrigation audits, in-home water audits, and even the use of smart meters. Smart meters, irrigation audits and water use efficiency mapping all collect on-the-ground water use data that water providers and customers can better understand and improve their water usage. Water use efficiency mapping is used to identify a municipality's cost-efficient customers and target them with rebates, education and other incentives.

OUTDOOR WATERING RULES
Water providers and municipalities are used to discuss watering practices, and the watering more frequently than needed, the rest of the day, or with over-watering non-landscape zones. Implementation of watering rules can be enforced by fines, as a means of promoting drought, if not on a permanent basis. A study by the Alliance for Water Efficiency found that voluntary conservation goals "generate significant water savings, but mandatory restrictions reduce a full compliance by 18%-30% and cut monthly bills by as much as 42%."

THE COLORADO WATER PLAN

A Bridge to Collaborative Action

Kevin Reidy
Senior Water Efficiency Specialist
Water Supply Planning



COLORADO
Colorado Water
Conservation Board

Department of Natural Resources

THE BOARD, THE MISSION, THE PLAN.

- The Colorado Water Conservation Board (CWCB) provides policy direction on water.
- There are many agencies and groups we work with on policy and projects – we do not build projects. We support them through funding.
- The Colorado Water Plan was published in 2015, updated in 2023, and is a living document to highlight key challenges.

MISSION:

“To conserve, develop, protect and manage Colorado’s water for present and future generations.”

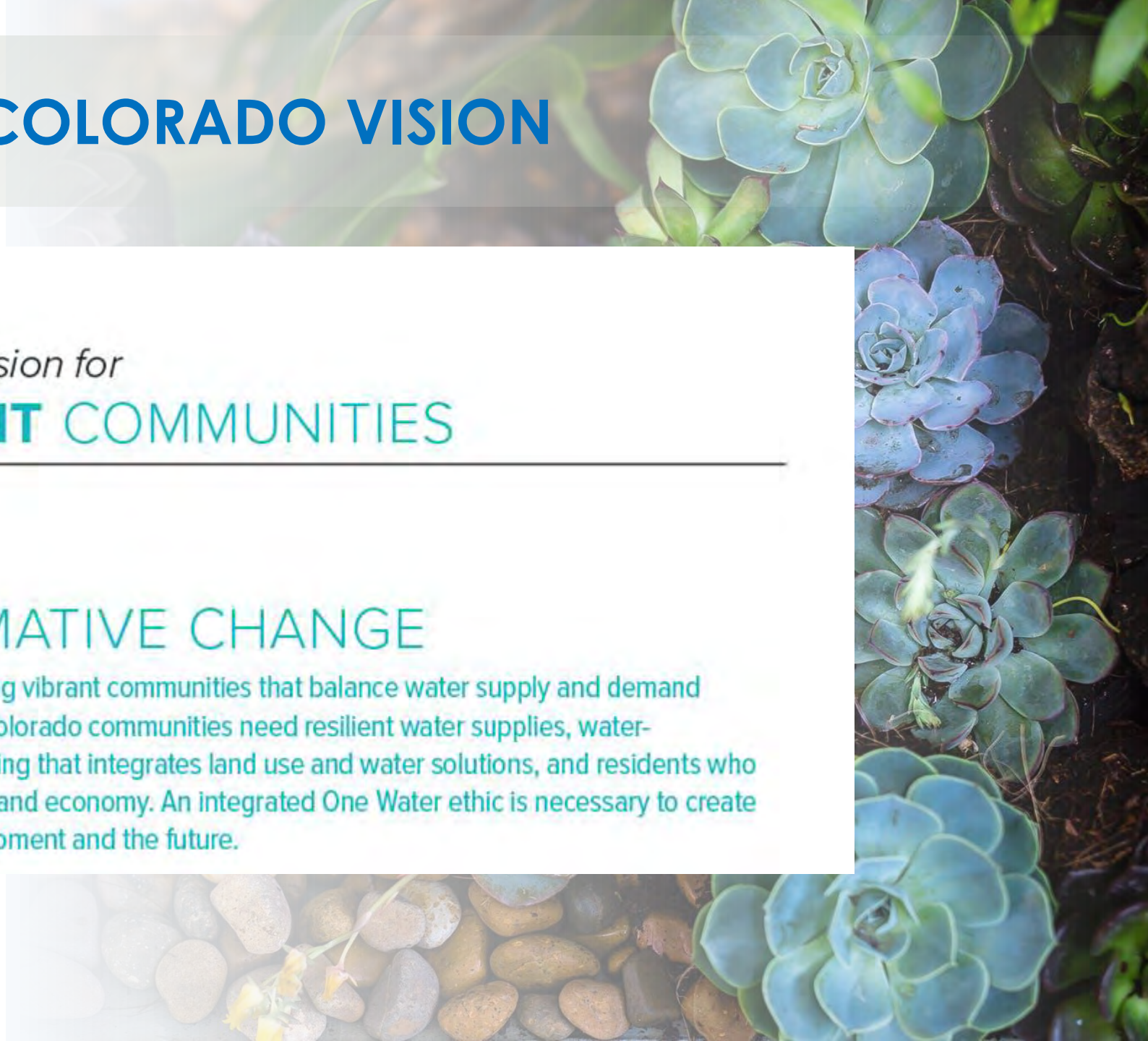
WATER PLAN SETS A COLORADO VISION



Colorado vision for
VIBRANT COMMUNITIES

CREATE TRANSFORMATIVE CHANGE

Holistic water management is essential for creating vibrant communities that balance water supply and demand needs to create a sustainable urban landscape. Colorado communities need resilient water supplies, water-conscious and attractive urban landscapes, planning that integrates land use and water solutions, and residents who understand the importance of water to their lives and economy. An integrated One Water ethic is necessary to create the transformative change needed to meet the moment and the future.



AGENCY ACTIONS-WATER EFFICIENCY & LAND USE



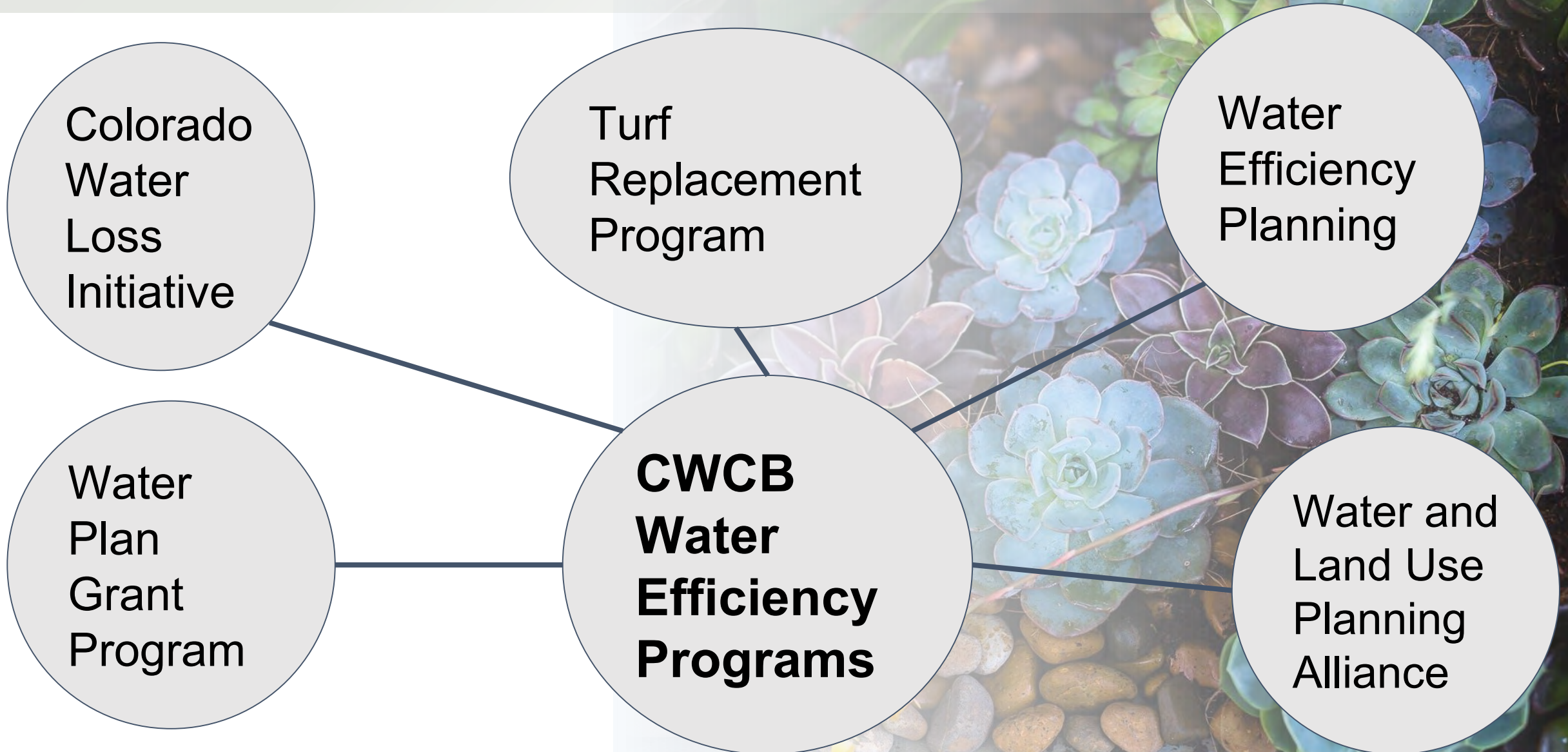
1.1 Define, benchmark and institutionalize water-resilient communities

1.3 Drive enhanced water loss tracking to help address future water needs

1.6 Promote One Water strategies for integrated water and land use planning

1.7 Identify turf replacement options that support transformative landscape change

AGENCY PROJECTS-WATER EFFICIENCY & LAND USE



BUILDING BLOCKS FOR A WATER-SECURE COLORADO

- We need local communities, individuals and organizations to implement.
- We can help with grants, loans, tools, studies and other support.
- We have technical experts and 4 new regional coordinators



CONSERV
ATION



LAND
USE



STOR
AGE



EDUCA
TION



SUP
PLY



AGRICUL
TURE



WATERS
HED

THE COLORADO WATER PLAN

Inspiring Collaborative Action

Questions?
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COLORADO

Colorado Water
Conservation Board

Department of Natural Resources

Photo Credit: Denver Post, housing project near Johnstown

2023 Colorado Legislative Water Workshops

Water & Housing in Colorado

April 12, 2023



Topics to Cover

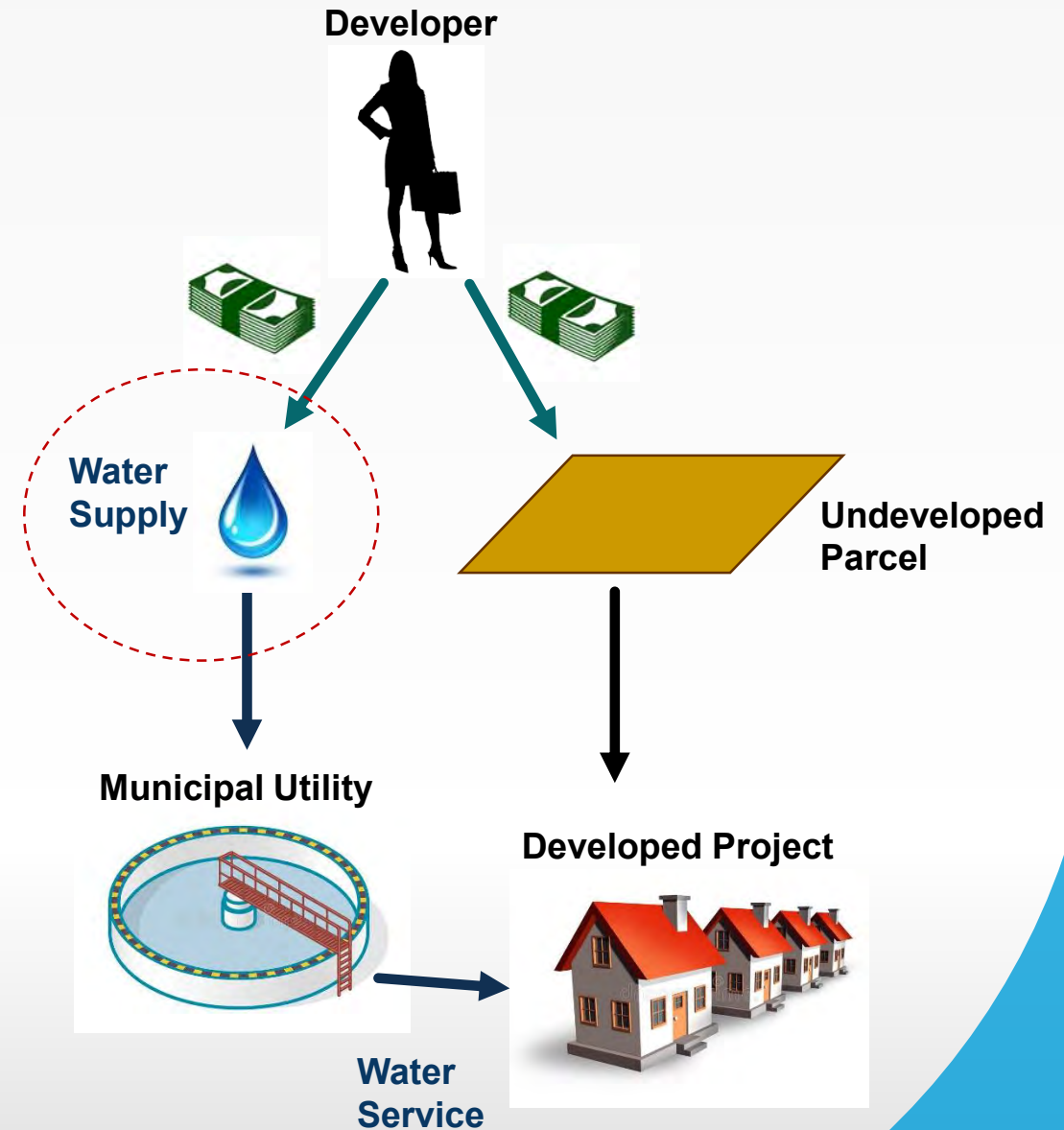
- 1. Water Requirements to Build New Homes**
- 2. Water Factors Influencing New Home Costs**
- 3. Variability in Water Factors**



Water Requirements to Build New Homes

Water Dedications

- **Water service is secured for all new homes.** A land development project needs to receive water service from a municipal water utility. Potable water service is typically a required element of municipal or county code to receive a certificate of occupancy.
- **New water supply is required for water service.** In order to provide a permanent commitment to serve a new water demand, municipal water providers require that additional water supplies be dedicated (or paid for) by the new demand. This is consistent with “growth pays its own way” philosophy of most water utilities.
- **New homes pay for water supply upfront.** Water supplies for new growth are satisfied before the homes are occupied. Water rights or cash equivalent are dedicated to municipal water provider in exchange for permanent water service - it’s a one-time transaction that takes place at time home development.
- **Local water markets are tied to water dedications.** In most areas, local water transaction activities are driven by need to satisfy water dedication requirements. Market prices for water rights often reflect the value of new home sales and the costs of alternative options for securing municipal water service.
- Monthly water bills DO NOT reflect the market value of water rights and the additional costs associated with serving new homes.



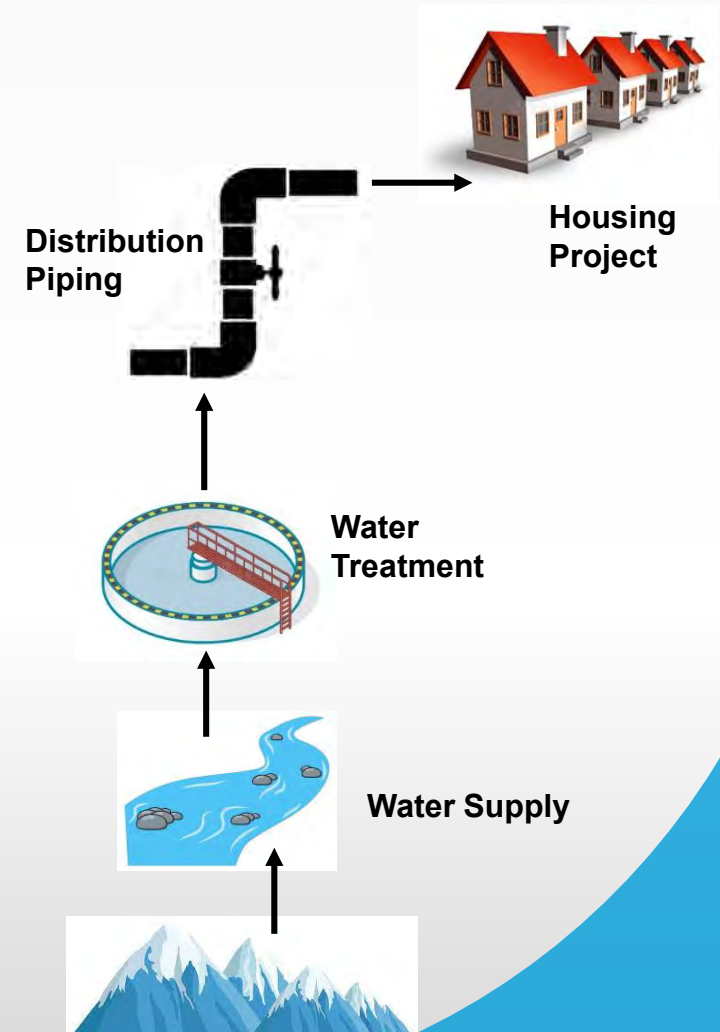
Common Water Dedication Options

1. **Purchase irrigated farmland** → dedicate water rights → sell dryland parcel
2. **Purchase irrigated farmland** → dedicate water rights → develop parcel into homes
3. **Purchase water rights** → dedicate water rights
4. **Pay Cash in Lieu (CIL) fee** → water utility acquires new supply (rights, projects)
5. **Pay CIL fee** → water utility reimbursed for value of existing supply



Various Factors Influencing Developer's Water Cost

- 1. Water Dedication Volume:** The volume of water required to be dedicated for each new home that will receive water service. Typically varies by housing type and satisfied through water right dedication or payment of CIL fees. Reflects the expected average annual volume of water use by the proposed development, plus some form of safety factor to ensure dry-year reliability.
- 2. Water Dedication Policies:** The options available for securing potable water service and the procedures required to be followed. Includes timing of water dedication & payments, flexibility in quantifying dedication volume, and options available for water dedication
- 3. Local Market Prices for Water Rights:** The market price for specific water rights that can be dedicated to secure municipal water service. Influenced by many factors including level of competition, precedence of transactions, and quality of supply.
- 4. Cash in Lieu Fees:** The required cash payment in lieu of dedicating water rights in order to secure municipal water service. Often reflects the expected cost of acquiring known water assets by municipal utility.
- 5. Plant Investment Fees:** The required cash payment for connecting into an existing municipal water utility. Intended to pay for the pro-rata share of use of existing capital facilities such as water treatment and distribution pipelines.
- 6. Water Supply Development Options & Costs:** The options available for a municipal utility to expand and increase available water supply and associated costs. Options typically include acquiring water rights, acquiring contracts in water projects, building new projects, drilling new wells, and connecting into an existing system. More options typically lead to lower or more stable CIL fees.
- 7. Risk Tolerance:** Generally refers to the level of risk reduction embedded into the water policies of a municipal utility. Includes factors such as modeled droughts, safety factors on water supply, assumed yield of dedicated water supplies, anticipated future use of new homes, and timeline of future supply planning.

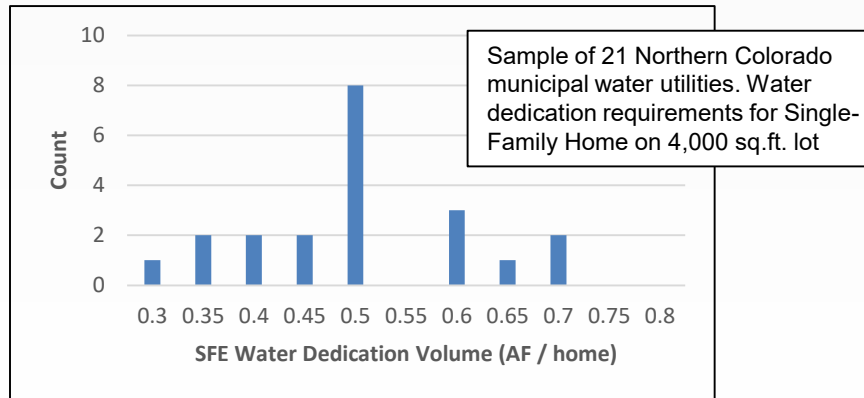


Water Factors Influencing New Home Costs

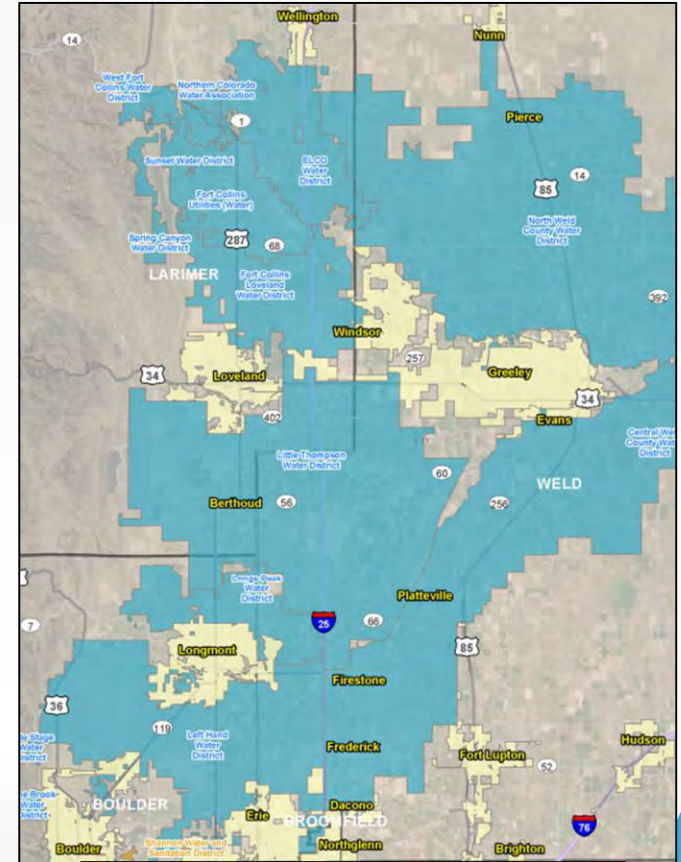
Variability in Water Factors

1. **Water Dedication Volume** →
2. **Water Dedication Policies**
3. **Local Market Prices for Water Rights**
4. **Cash in Lieu Fees**
5. **Plant Investment Fees**
6. **Water Supply Development Options & Costs**
7. **Risk Tolerance**

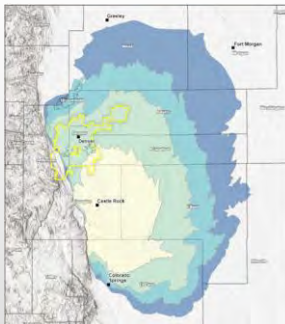
Factors Influencing Dedication Volume
 Size of Development
 Type of Development / Housing Product
 Landscape Irrigation (Non-Potable) Plans
 Municipal Water Utility Policies
 Municipal Water Utility Risk Profile



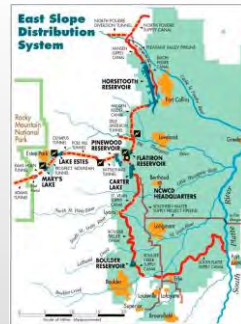
Sample Map of Municipal Utilities in NoCo



Over 27 municipal water providers in Northern Colorado. Over 80 municipal water providers across the Front Range, each with an independent set of water dedication policies.



Denver Basin Groundwater



CBT System Reliance



Supply Diversity

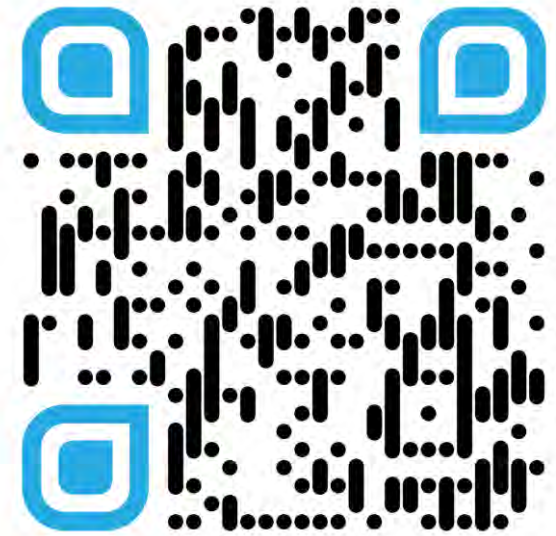


Thank You

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Water Market Insider

Water Efficiency and Reuse in Castle Rock

April 12, 2023



Water Conservation Goals

Conservation is considered a water supply for Castle Rock.
The less we use today, the less we have to pay for in the future.

- Save money for existing / future residents
- Ensure a sustainable long term supply
- Reduce per capita demand to 100 gallons per capita per day or less
- Decrease peak demands during irrigation season
- Implement ColoradoScapes Plan
- Reduce high water using non-functional turf by 30%
- Minimize turf used in new development

Year	Total Demand (AF)	Estimated Volume Outdoor Use (AF)	% Outdoor Use
2017	8,282	3,479	42%
2018	8,842	3,891	44%
2019	8,711	3,746	43%
2020	9,979	4,590	46%
2021	9,795	4,114	42%

Water Conservation Tools

Conservation is considered a water supply

The less we use today, the less we have to pay for in the future.

Rates and Fees

- Water Budget Rate Structure

Infrastructure

- Water loss tracking
- Advanced metering infrastructure

Education

- Water Wiser
- Elementary school visits
- Water plant tours
- Water Ambassador (SMWSA)
- Irrigation assessments
- CRconserve.com
- ColoradoScape campaigns

Rebates

- ColoradoScape renovation
- Smart controller retrofit
- Rotary nozzle retrofit
- Ultra-efficient toilets

Regulation

- Landscape regulations
- Landscaper registration/training
- Water Use Management plan
- Watering schedules
- Water monitors
- Drought Management Plan

Development Incentives

Landscape Renovations

ColoradoScape Renovation

- \$1.50 per square foot rebate
- 400 to 1,500 square feet for residential projects
- 1,500 to 15,000 square feet for non-residential projects
- \$200,000 budget
- First come first served

Ballfield Conversions

- Partnership with Parks
- Completed 2 projects to date
- Investments to date

ColoradoScape is a natural landscape, comprised of low to very-low water-use-plant material, which blends in with the native Castle Rock landscape. This landscaping utilizes a combination of hardscape and plant materials, providing a variety of colors, textures, sizes, shapes, and seasonal interest.



ColoradoScape Renovation (Meadows)

Minimize New Turf

2022 ColoradoScape Ordinance

- Development permitted after 1/1/2023
- No turf grass in residential front yards
- <500 square feet of turf grass in residential back yards
- ColoradoScape instead
- Incentivize builders to install front and back yards
- No non-functional turf grass in non-residential projects



High Efficiency Toilets

Current Rebates for Toilets

- 0.8 gallon per flush toilets to replace old toilets
- \$150 per toilet
- Up to \$600 per customer
- Old toilets recycled

Potential Ordinance

- Require high efficiency 0.8 gallon per flush toilets going forward

The "Throne Zone"



Current Reuse in Castle Rock

- Non-Potable Reuse
- Gray Water
- Indirect Potable Reuse



First Gray Water Systems hit Castle Rock in 2021/2022

Reuse as a Supply

Legally Reuseable to Extinction (60-90%)

- Nontributary nonrenewable groundwater
- Imported renewable water

Legally One Time Use (10-40%)

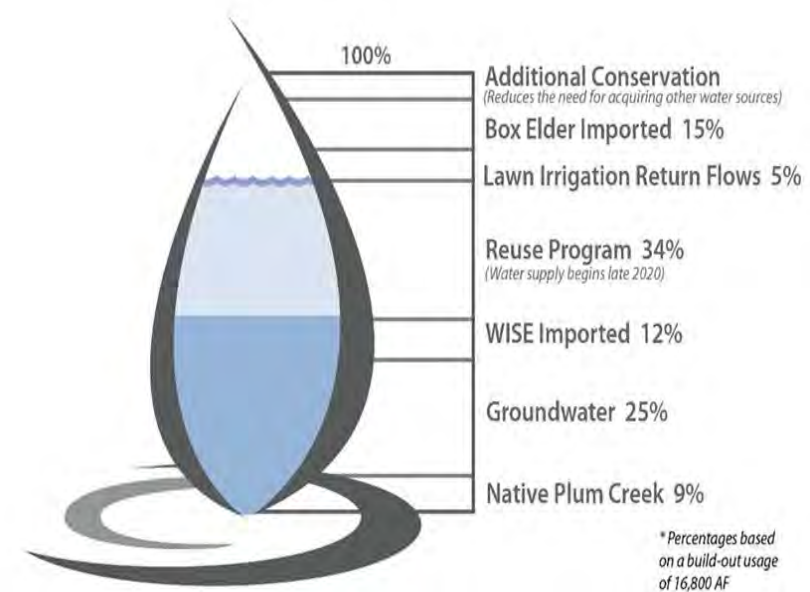
- Plum Creek Water Rights
- Chatfield Reservoir (South Platte)

Physically Reusable

- Indoor use
- Some lawn irrigation return flows

Physically Not Reusable


- Most outdoor irrigation



Potable Reuse System



Planning for Reuse

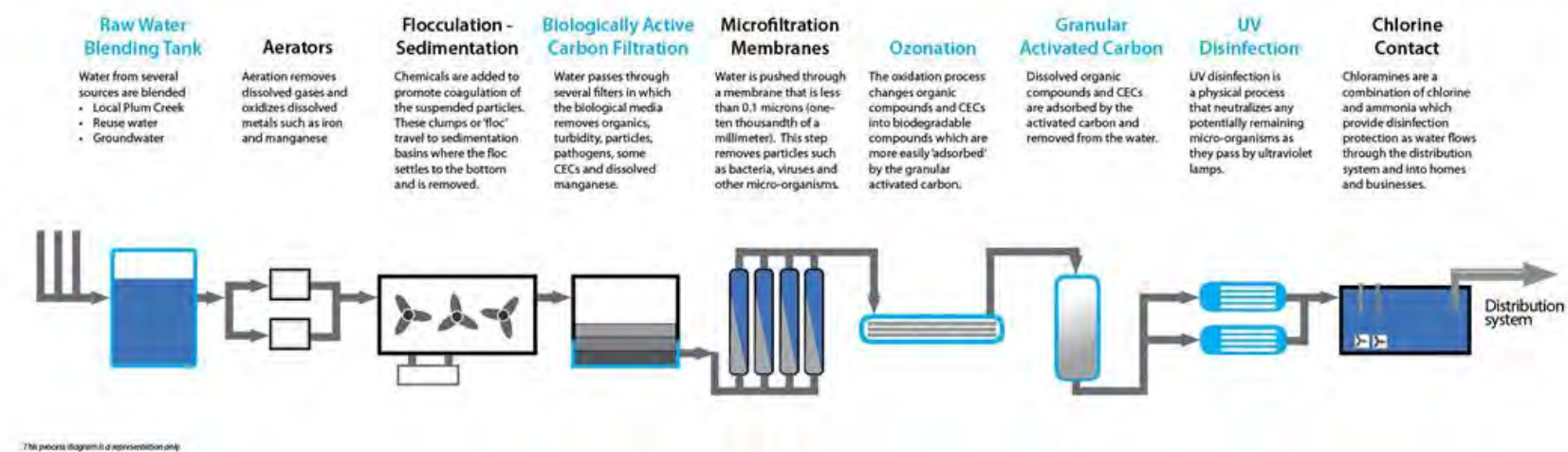
Plum Creek Water Purification Facility *with Advanced Treatment*



Plum Creek Water Purification Facility is being expanded to include Advanced Treatment processes, which are denoted in blue. While treatment already meets local, state and federal regulations for safe drinking water regardless of sources, the Advanced Treatment processes provide added redundancies, focus on removal of contaminants of emerging concern (CECs), and address new standards being established by reuse systems throughout Colorado and the U.S.

Traditional and reuse treatment systems include physical, chemical and biological processes for a comprehensive treatment for purity in drinking water. These processes are designed to remove Giardia, Cryptosporidium, viruses, suspended solids, bacteria, algae, fungi and CECs such as pharmaceuticals and personal care products.



Indirect Potable Reuse (IPR)

Performance to Date

- ~1,000 acre feet since February 2021
- Averaged ~15% of total supply in 2022

Next Steps

- Expansion of system
- Pump back from Chatfield

Challenges

- Salt
- PFAS



Granular Activated Carbon Filters at Plum Creek Water Purification Facility

Direct Potable Reuse (DPR)

Passing of Regulations

- Stakeholder Process
- Excellent Work by State
- Multi Year Process

Summary of New Regulations

- Potential Benefits for Castle Rock
- Salt Challenge
- Additional Challenges for Castle Rock

Next Steps for Castle Rock

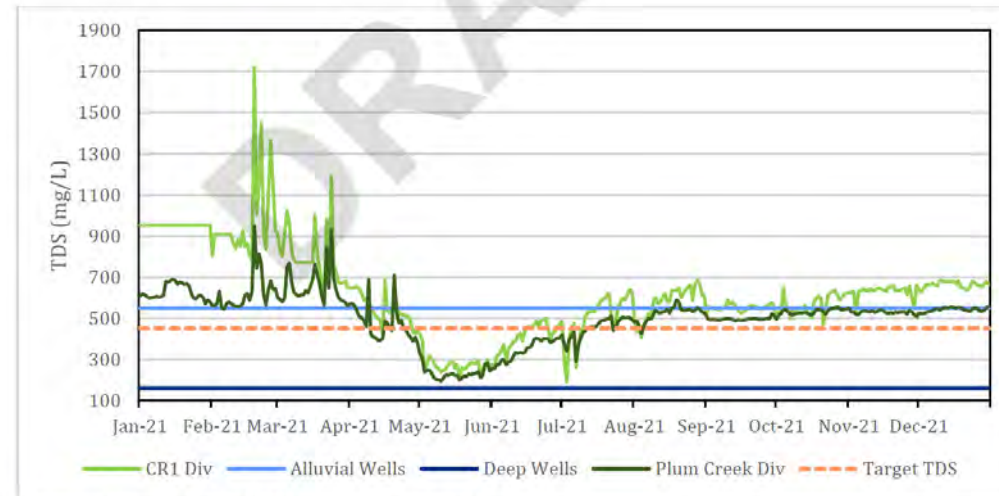


Figure 4 Source Water TDS Concentrations at PCWPF

Thanks

Director of Castle Rock Water
Mark Marlowe, PE
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720-733-6001



Ultraviolet Radiation at Plum Creek Water Purification Facility



Defining Water Use for Growth & Setting the Standard for Sustainability in the West

April 12, 2023

Dominion Water & Sanitation District Background

- Formed in 2004
- Located in Northwest Douglas County
- Wholesale water and wastewater provider
- Encompasses 33,000 acres
- Founded to serve Sterling Ranch and surrounding communities on failing wells



About Sterling Ranch



3,400

**Total
Acres**

**1,500+
Occupied
Homes**



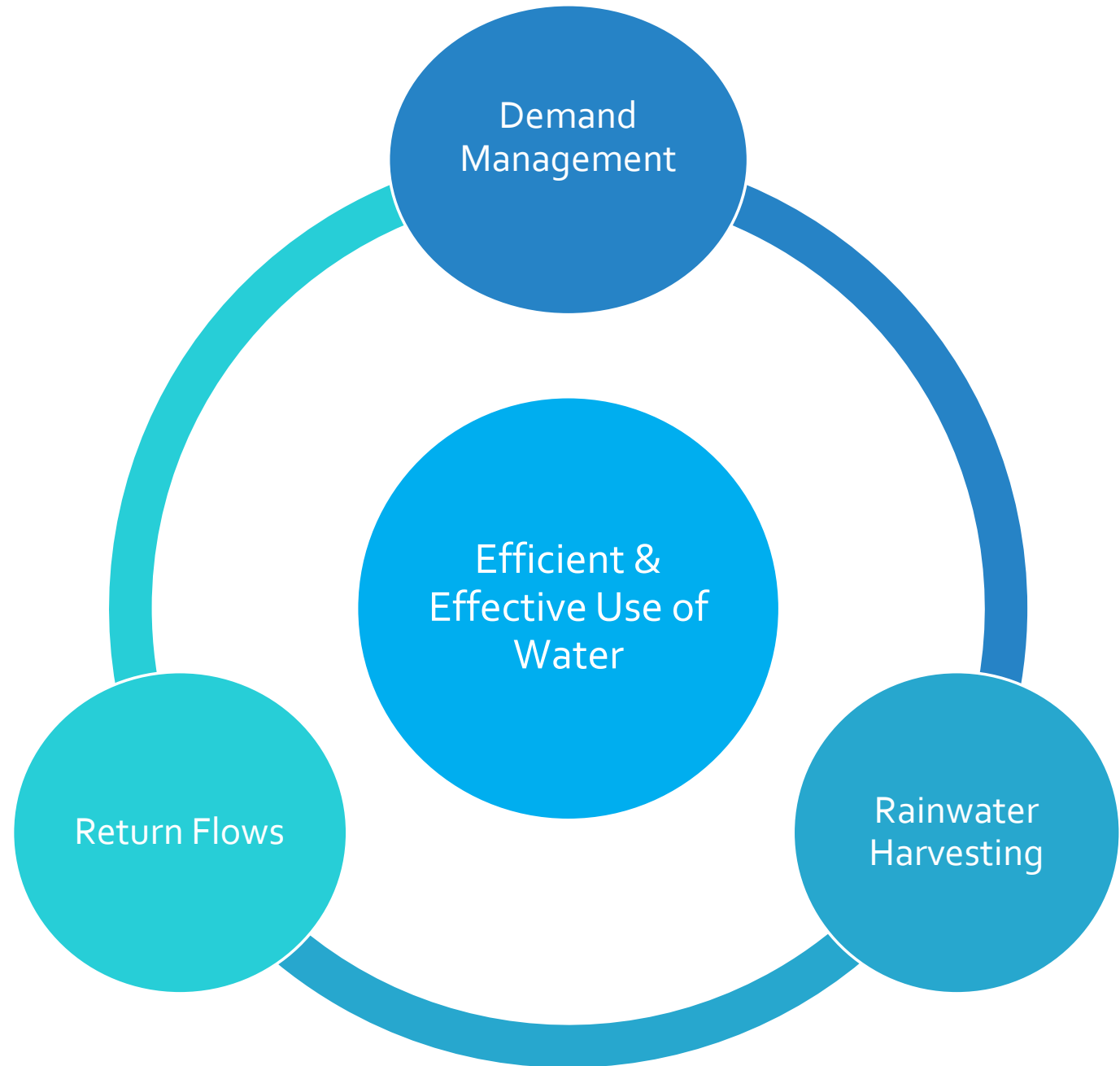
1,300

**Acres Parks &
Open Space**

12,000+

**Planned
Homes**

*Developing a
Full Closed
Loop System*



Measurable and Sustainable Water Use

Douglas County
Standard 0.75
AF/SFE

- 244,500 gallons per year

2013 Water Appeal
Reduced Demand
Standard 0.40
AF/SFE

- 130,400 gallons per year

2021 Actual Usage
on Average 0.20
AF/SFE

- 65,200 gallons per year

This water savings means that Dominion and its retail customer Sterling Ranch has achieved some of the lowest per-home water consumption in Colorado, and sets the standard for the state and region, reaching or exceeding the water demand management goals in the Colorado Water Plan.

Sterling Ranch is Setting the Standard for Water Sustainability

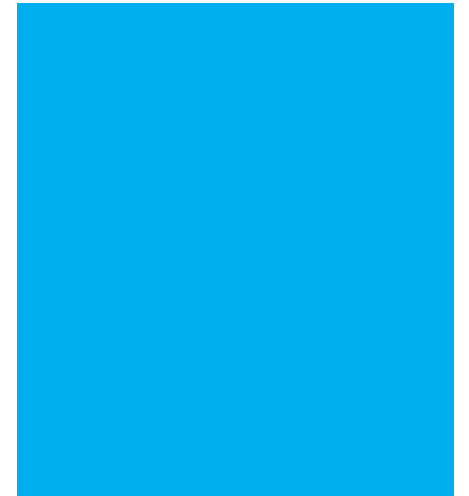
Innovative, intentional land planning

Smart irrigation control systems

Dual water metering

Drought tolerant plant selections and landscape guidelines – in partnership with Botanic Gardens

Water demand management vs. outdated philosophy of “water conservation”



Water Demand Management



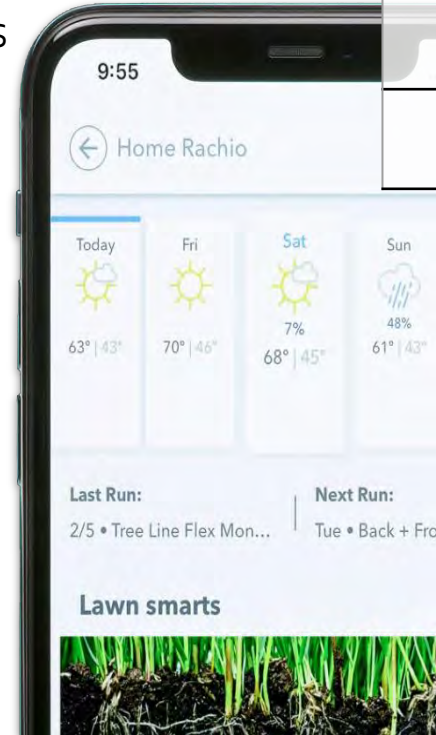
RESIDENT COMMITMENT AND PRIDE



TIERED WATER RATES INDOOR VS OUTDOOR



HOMEOWNERS GET NEAR REAL TIME CONSUMPTION DATA



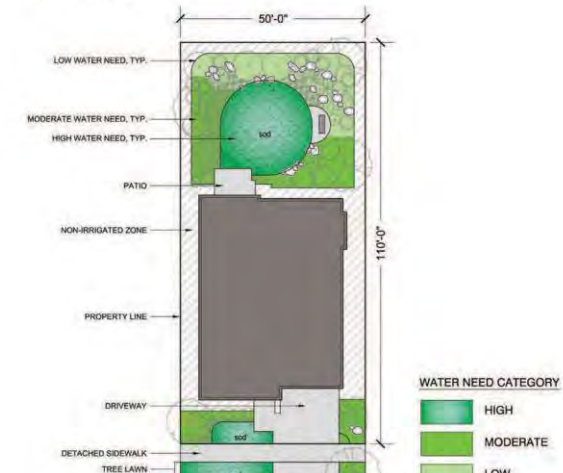
LOT SIZE SQ. FT. (without ROW)		WATER BUDGET (gallons / year)
0	3,000	10,000
3,001	4,000	12,500
4,001	5,000	15,000
5,001	6,000	27,000
6,001	7,000	32,000

LANDSCAPING STANDARDS :

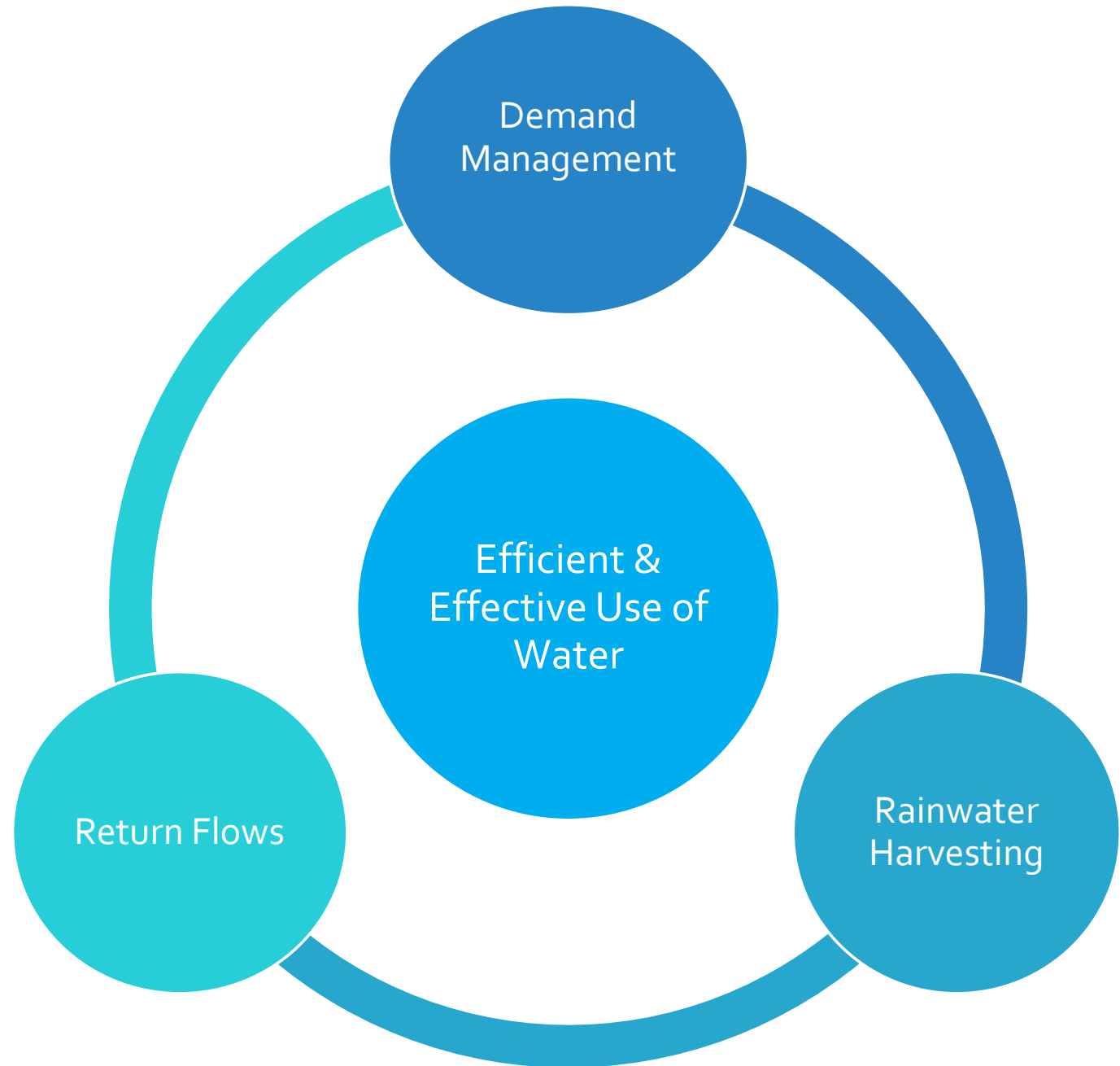
6.7 Example Landscape Plans

The following example landscape plans are representative of landscape designs that meet the landscape water budget of each associated lot size. The landscape water demand for each lot will be calculated based on the selected irrigated water use zones (high, moderate, and low). The Pre-approved Plant List for Sterling Ranch, included as Appendix 9.9 organizes acceptable tree, shrub, grass and perennial species by their relative irrigated water use zone and shall be used to classify selected plants into the appropriate zone. Refer to Appendix 9.9.

Figure 1
50 x 110 Lot Example Plan



*Developing a
Full Closed
Loop System*



Rainwater Harvesting Pilot Program



HB09-1129

Creates rainwater harvesting pilot projects - outdoor non-potable use

Up to 10 projects, maximum 3 per river division

Allows for precipitation to be harvested under an approved SWSP or Augmentation Plan



HB15-1016

Incentivizes pilot projects by introducing accounting Factors

Factors are an accounting tool to estimate allowable harvest in a pilot project development without extensive monitoring period



SB23-178

Clarification to Sunset Date of July 1, 2026 added as an amendment

Provides for the statutory right to adjudicate the augmentation plan for rainwater harvesting as long as the water court application is filed prior to the sunset date

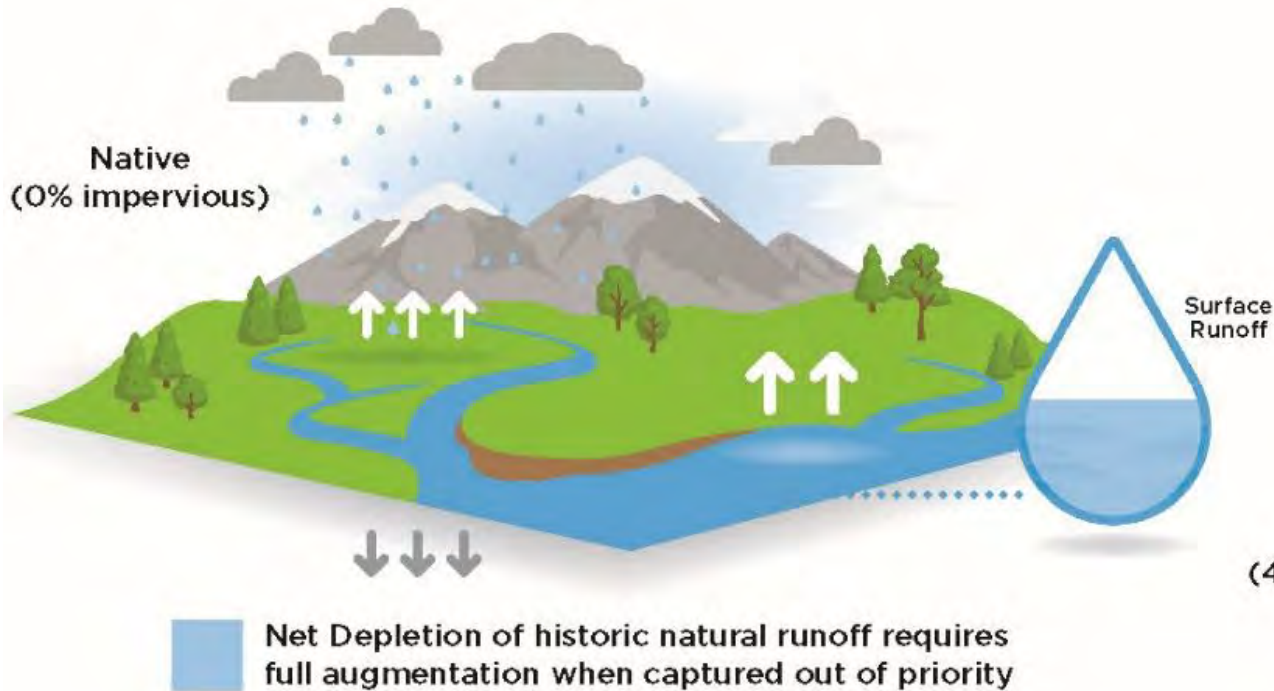
Sterling Ranch Rainwater Harvesting Pilot Project

The only active Pilot in the State
Over a decade of natural conditions
data collected
Developed Regional Factors
Accounting completed to support
Substitute Water Supply Plan (SWSP)
and Augmentation Plan process
Pilot Project has received multiple
CWP grants in support of the program

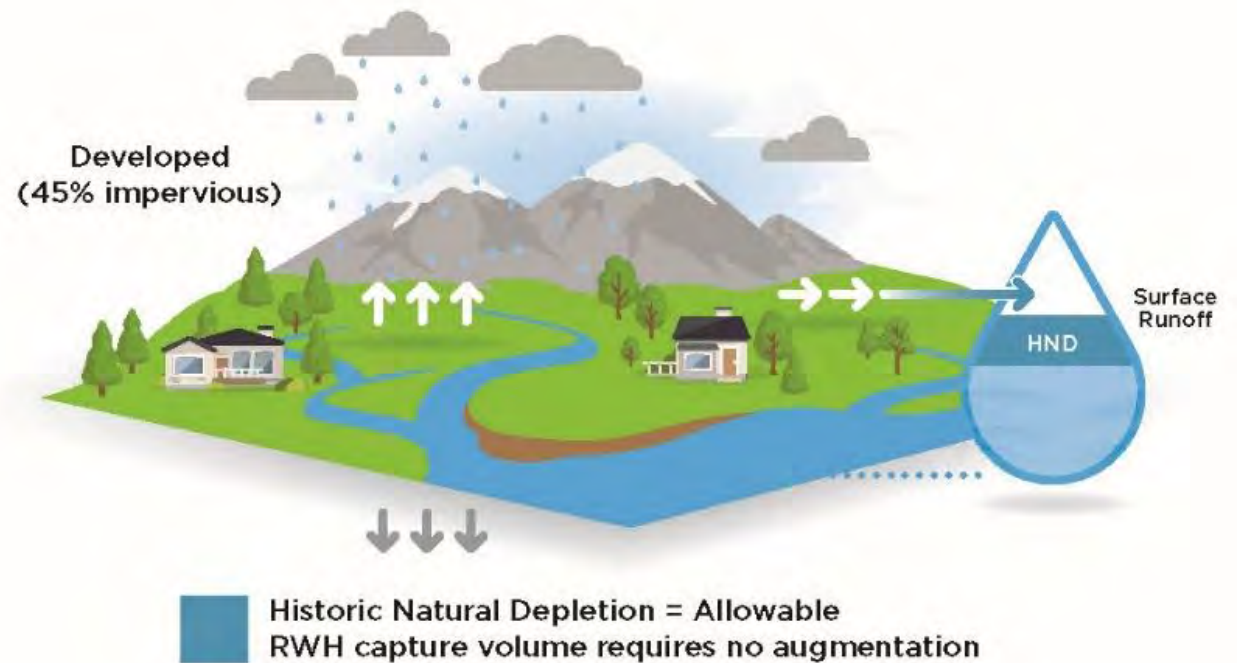


How Does Rainwater Harvesting Work?

Before Rainwater Harvesting



After Rainwater Harvesting



Rainwater will be captured in Sterling Ranch and used to create regional parks

Help meet local irrigation demands.

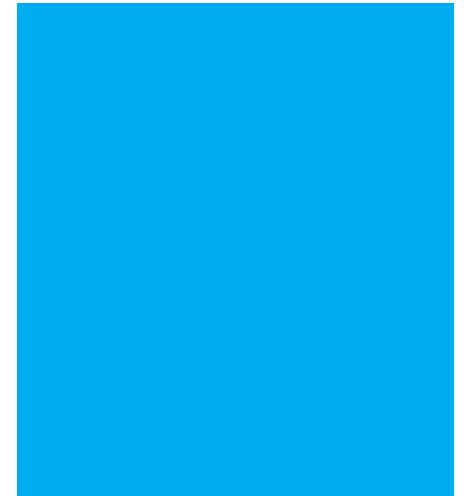
Support responsible development of parks, open space, and functional turf areas

Promote and exemplify water conservation practices within the community.

Increase the availability of renewable water supplies to help meet outdoor uses

Reduce the reliance on non-renewable groundwater resources.

Reduce local infrastructure and system development costs when implemented as a part of the development.



Next Steps for Rainwater Harvesting Implementation

Summer
2023

File Water Court Application for Augmentation Plan for Rainwater Harvesting

2024

Some additional legislative changes may be needed to integrate rainwater and stormwater infrastructure

2023-2025

Advance design and initiate construction of regional rainwater harvesting at Providence Park

Questions?

Andrea Cole
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Thank you for coming!
All materials will be posted at the site
below:

www.wateredco.org/2023-legislative-water-workshops/
www.cowatercongress.org