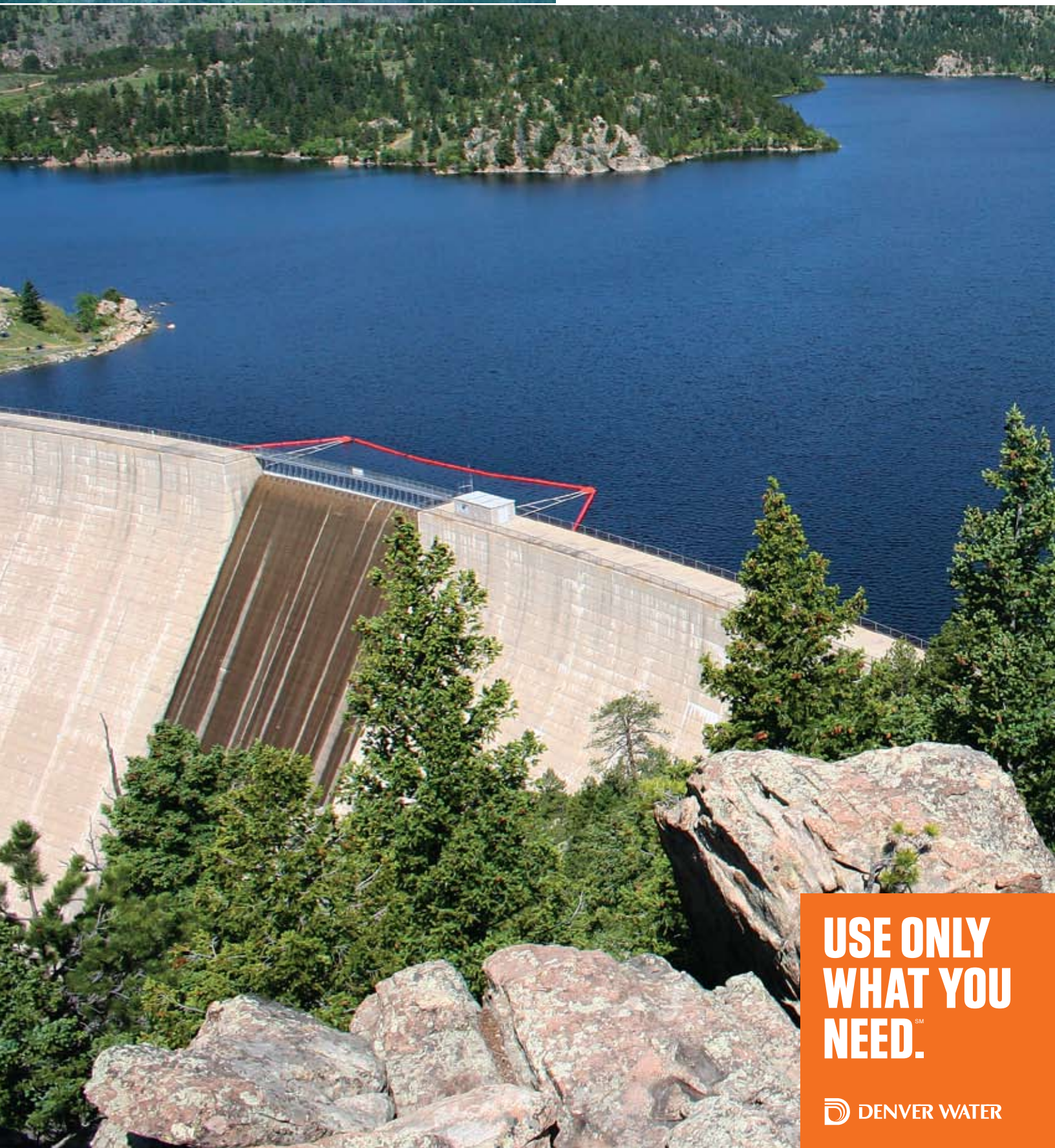
SOLUTIONS

2010

SAVING WATER FOR THE FUTURE



USE ONLY WHAT YOU NEED.℠

DENVER WATER

Contents

As Denver Water's new CEO/Manager, I'm honored to lead an organization with a proven commitment to conservation. Prior to joining Denver Water, I spent the past 20 years representing the state of Colorado and a coalition of major water utilities and districts – including Denver Water – with regard to interstate Colorado River operations and issues. I look forward to helping Denver Water continue meeting supply challenges through conservation, recycled water and new supply options.

Creating a culture of conservation presents the opportunity to implement new and exciting programs. The 2010 issue of *Solutions* outlines the programs and projects that are doing just that, and this issue has expanded the scope to also provide insight into Denver Water's recycled water and new supply efforts.

In the spirit and memory of Chips Barry, Denver Water is as committed as ever to providing a secure water future and encouraging all Coloradans to follow our call to "Use Only What You Need."

Sincerely,
Jim Lochhead
CEO/Manager, Denver Water

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Denver Water loses an icon

When Chips Barry worked for the state of Colorado, he bought his clothes at a thrift shop. When he got the job as Denver Water's manager, he said he'd start buying clothes new – but added that he'd check in on the second-hand shops now and then.

"He was frugal at work too. He thought it was the public's money, and he wanted to be careful about it," said Sara Duncan, Denver Water's retired intergovernmental affairs coordinator who has known Barry since they were teenagers. "But he was frugal in his own life because he knew what was important. And it wasn't money. It was people."

Barry, Denver Water's manager since 1991, died May 2 in a tractor accident on his farm in Hawaii. He had planned to retire July 1.

Barry was known for his approachable leadership style, sharp intelligence and easygoing sense of humor. Board president Penfield Tate said Barry was, in many ways, the guiding force behind the organization.

"In today's workplaces, which are often sterile and rigid, Chips was anything but," Tate said. "Chips will be greatly missed and richly remembered."

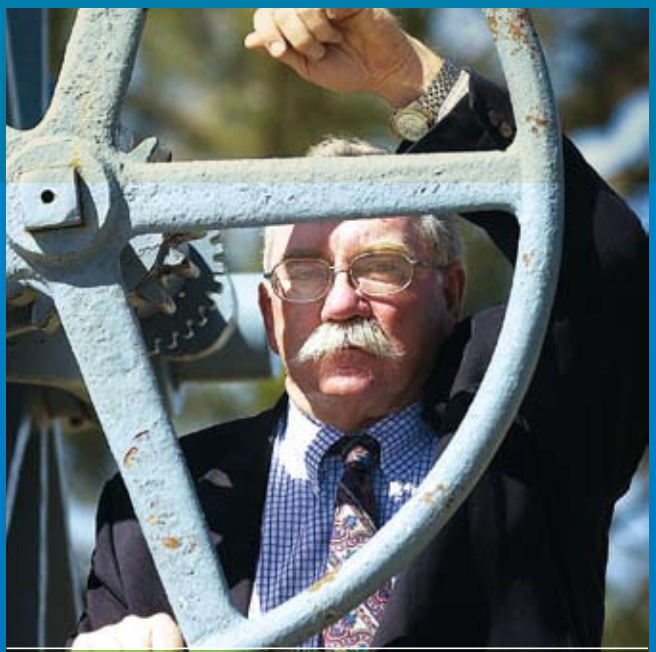
Barry was well-educated and well-traveled, attending Denver Public Schools, Yale College and Columbia Law School. After law school, he worked as a VISTA volunteer in rural Alaska, as a law clerk to Judge Robert McWilliams on the 10th Circuit Court of Appeals in Denver and as a legal services lawyer in Micronesia.

In 1975, he returned to Colorado from the Marshall Islands, resuming a career in western water and natural resources matters. Barry, Denver Water's longest-serving manager at almost 20 years, worked in Gov. Roy Romer's cabinet as the executive director of the Colorado Department of Natural Resources before moving to Denver Water.

But Barry was much more than an accomplished resume. He was an avid tennis player who collected old Saabs, foreign paper money and books about Micronesia and Alaska. He loved his family – wife Gail, son Duncan, daughter-in-law Karolina, son Pennan, daughter-in-law Winnie and grandson Malcolm, and enjoyed spending time with them on his macadamia nut and coffee farm in Hawaii.

Earlier this year, in a letter to employees announcing his retirement, Barry expressed his gratitude for the opportunity to lead Denver Water for two decades.

"I have very much enjoyed my time, and all the opportunities and challenges, during the last 20 years at Denver Water," he wrote. "It has been my great honor to work with you all."



During Barry's tenure at Denver Water, the utility built a recycled water distribution system, spent millions on improvements at its treatment facilities, monitored recovery from several devastating wildfires in Denver Water's watershed and led the scramble to recover from a devastating drought, among countless other accomplishments. *Photo courtesy of The Denver Post.*

Denver Water has a diverse plan to meet future needs: conserve, recycle, supply.

Diverse plan helps meet future water needs

For more than 90 years, Denver Water has provided high-quality water to its customers.

Denver Water's extensive and reliable system is the result of nearly a century of progressive planning, and this legacy continues today.

"Our water world could change a lot in the future, and we want to be prepared for those changing conditions," said Marc Waage, Denver Water's manager of water resource planning. "We want to do our part in the tradition of leaving future generations with a robust water system like the one we inherited."

Denver Water is investing millions of dollars in developing innovative ways to meet its most important responsibility – ensuring customers always have the quantity and quality of water they need. It no longer relies on only one option, building new reservoirs, to fulfill that mission. Instead, Denver Water has a diverse plan to meet those future needs: conserve, recycle, develop.

And it's working. Denver Water customers are using 18 percent less water than they were before the 2002 drought – and there are 10 percent more of them. Denver Water's recycled water distribution system is freeing up enough drinking water to serve roughly 15,000 households; once it's complete, the system will free up enough drinking water to serve almost 45,000 homes.

And Denver Water has begun plans to expand Gross Reservoir, which would allow the utility to supply customers with an additional 18,000 acre-feet of water each year – the amount of water used by roughly 45,000 homes. It's also turning gravel pits to water storage sites, which allows it to store and release reusable water to meet downstream water requirements.

An upcoming Integrated Resource Plan, which will be released later this year, details a new long-term plan for the water system to help Denver Water continue to meet its mission.

Water is one of the most valuable resources in our dry state. Denver Water will continue doing everything it can to manage it responsibly while making sure its customers always have the water they need.

Creating a culture of conservation

Denver Water can only do so much to create a culture of conservation – the rest is up to its customers. And Denver Water customers have proven they are up to the challenge.

"Our customers are doing a great job cutting their water use," said Denver Water Conservation Manager Melissa Essex Elliott. "They are changing their behavior, which in the end saves costs for us."

Some of the behavior changes include not watering in the rain and heeding the call to water lawns only two days a week – three days in dry weather. Other customer behavior changes include replacing inefficient appliances or fixtures by taking advantage of Denver Water's rebates.

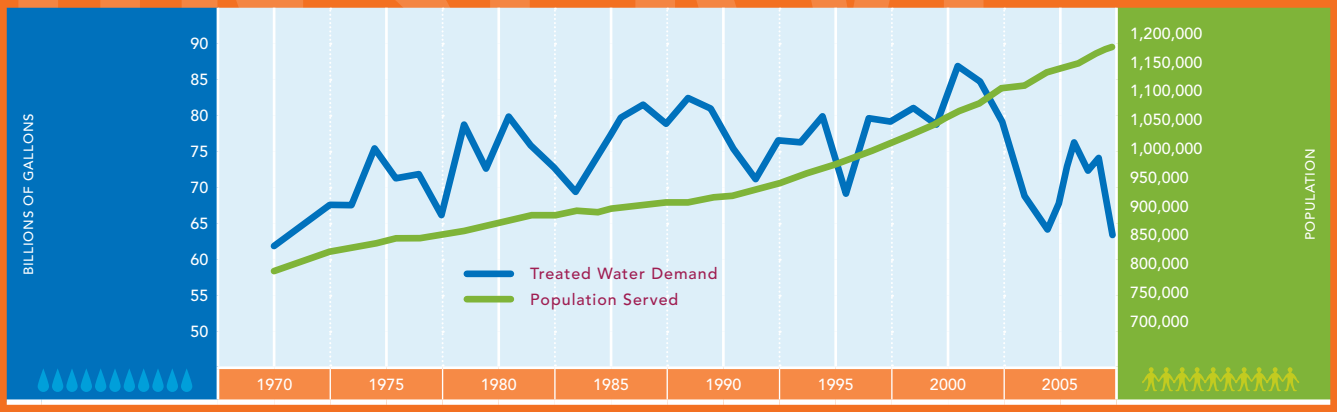
"We have programs for everyone – residents, HOAs, nonprofits, commercial and industrial customers," Elliott said. "Cultural change is driven by outreach, and we're working to make sure we reach all of our customers."

Denver Water's conservation programs include:

- Residential, commercial and industrial rebates.
- Free water-use audits.
- Incentive contracts for commercial, industrial and institutional customers.
- Irrigation Efficiency Program, where Denver Water pays homeowners associations, commercial or irrigation-only customers for each thousand gallons of water saved annually over a five-year contract period.
- Licensed GreenPlumbers, who replace inefficient plumbing fixtures at targeted, high-use customer properties.
- Indoor water audits for low-income housing providers, educational institutions and other 501(c)3 organizations to help with the costs and installation of new efficient water-using fixtures.
- Performance contracts and free products for government agencies to help them use less water.

"In addition to reaching out to our customers, we're also trying to find ways to thank them," Elliott said. "I think the thank you message in our customer newsletter last fall summed it up pretty well: 'You are so totally awesome.'"

Treated Water Demand and Population 1970 - 2009



The population in Denver's service area has increased by more than 40 percent since 1970, but Denver Water is serving its customers with the same amount of water that it did in 1970. Denver Water serves 25 percent of the state's population with just 2 percent of the state's water.

Denver couple swaps grass for garden

When the Florimontes first bought their house in north Denver five years ago, their new yard had a lot of thirsty grass and one lone tree.

Alexandra Florimonte stands in her front yard, which is covered with low-water-use plants.

"I didn't pay too much attention to the lawn," Alexandra Florimonte said. "I knew it would go. It gave me a clean slate."

The retired couple decided to tear up their yard and replace it with a much more Colorado-friendly Xeriscape garden.

"We live in a desert," she said. "We shouldn't be using our water resources irresponsibly."

The couple had a Xeriscape garden in their former home, north of Los Angeles. But when they moved to Colorado, Alexandra had to learn about plants that would flourish in Colorado's climate.

Alexandra started taking local classes about Xeriscape planning and design and hired an affordable landscape architect to help her design the garden. Then she and her husband covered their lawn with black plastic to kill the grass. They hired a rototilling service to dig up the yard and installed a drip irrigation system for the low-water-use plants.

Then they started planting.

"You can have such beauty in your yard without wasting water," Florimonte said.

They planted rabbitbush and blue avena grass; dwarf iris, tulips and currants; poppies and penstemon; desert marigold and golden asters. Soon their yard was blooming with Mount Atlas daisies, columbines, phlox and other plants.

"There's so much to look at," Florimonte said. "It's amazing."

They dug a stream bed and arranged the plants into different zones according to the amount of water they need.

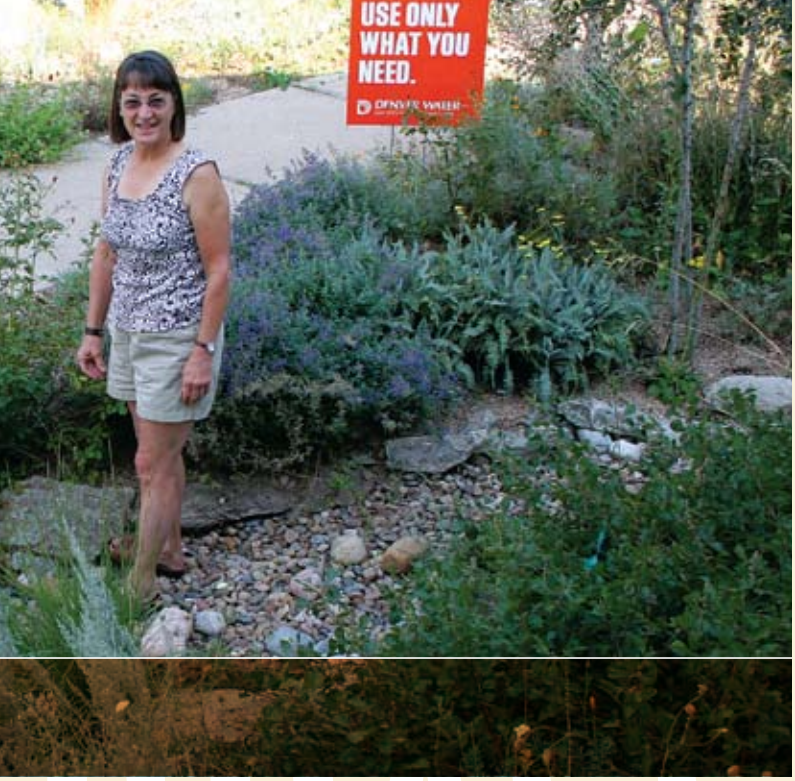
"The problem for me was my impatience," she said. "I wanted to put everything in and have it grow right away."

But she started small, and before long, the plants filled out the yard. She made adjustments to the garden by replacing faltering plants with those that grew better and exchanging seeds with neighbors.

It's a constant work in progress, but it's also surprisingly low-maintenance, she said.

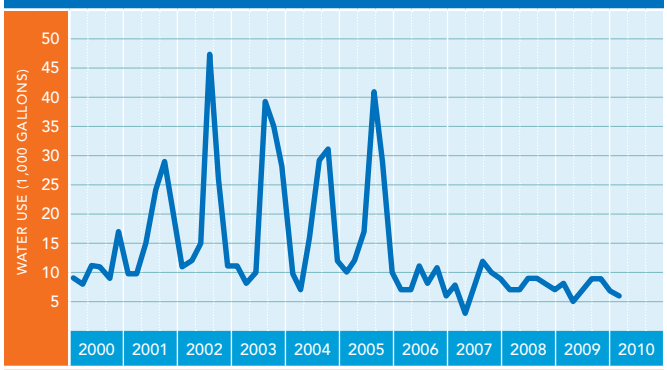
"I like a garden that can take care of itself," Florimonte said.

Their garden, which has more than 100 different plants, has five zones. There's the Xeric plant zone, which she waters occasionally depending on the weather, and the cactus garden, which she rarely waters. The two zones for herbs and vegetables get watered once every few days. And the strip of land between the sidewalk and street gets a drink once a month at the most. In fact, Florimonte said they didn't turn on their irrigation system until the last part of August in 2009. The yard is "so wonderful," she said. "I love sitting out here and watching it. There's so much texture, so many things happening in it."



The garden attracts a variety of bugs and birds, which is one of the reasons she wanted to grow a variety of native plants. "I really wanted to attract butterflies, bees and birds and help support that life in the city," she said. "And the hummingbirds don't come to the feeder; they come to the plants."

10-YEAR WATER CONSUMPTION FOR THE FLORIMONTES' PROPERTY



This chart shows the 10-year consumption data for the Florimontes' house. The couple moved in five years ago and soon replaced the Kentucky bluegrass with Xeriscape. Now the household is using about 85 percent less water than it did before Xeriscape was installed.

In the backyard, the Florimontes jack-hammered part of the concrete patio to make way for a vegetable garden and used the broken pieces of concrete to line a pathway through the garden. Now, instead of a thirsty green lawn, they have fresh peppers, tomatoes and other vegetables all summer long.

"Water is absolutely the most precious resource we have," Florimonte said. "You could go back to living in a primitive caveman-type community, but without water, you couldn't survive. We have to be more responsible in its use."

Targeting high irrigators

Denver Water doesn't have the legal ability to mandate how much or what kind of grass a person can plant. But Denver Water can help people water their lawns efficiently.

"Until you put the figures in front of people and show them how much water they could save, they don't give it much thought," said Dana Larson, a data technician in Denver Water's Conservation section.

In 2009, Denver Water started a pilot program aimed at helping households with high outdoor water use conserve water. Those high irrigators used 30 gallons of water per square foot outside, which is 12 gallons more than the recommended amount.

Fifty-three households in the Green Valley Ranch, Lowry and Hilltop neighborhoods signed up for the program, in which a conservation specialist visited each house and audited its irrigation system. The specialist adjusted the homeowners' sprinkler timers, educated them on how to best water their lawn to keep it green and left them with a guide on when to adjust their irrigation controllers as the weather changes.

Ten homes that were audited at the beginning of summer 2009 saw a 40 to 90 percent overall reduction in water use compared with summer 2008.

"It gives people a guideline to understand where they should be," said Tim LaPan, Denver Water's landscape architect who was in charge of the program.

Denver Water plans to expand the outdoor audit program this summer, starting with high-water-use homes in the University Hills neighborhood.

For more information about outdoor watering times, visit; www.denverwater.org/Conservation/WaterUseRulesRegulations.

End of the line for inefficient toilets

Denver Water expects to save 13.5 million gallons of water – enough to fill 20 Olympic-size swimming pools – by buying old, inefficient toilets from two Habitat for Humanity Home Improvement Outlets.

"It's a good idea," said Zach Lovato, a Denver Water conservation technician who oversees the program. "We're eliminating the option of people buying inefficient toilets and putting them back into use."

Habitat for Humanity accepts donations of used appliances, building materials, tools and furniture to sell at its two home improvement outlets in Denver and Wheat Ridge. Those stores help fund the nonprofit organization's home building projects. But when people donate inefficient toilets (more than 1.6 gallons per flush), others were buying them and putting them back into use.

"It's not helping save water at all because they're reusing old, inefficient toilets," Lovato said.

In the pilot program, Denver Water will buy up to 1,500 inefficient toilets for $35 each until Aug. 31, 2010. All of the proceeds go toward Habitat for Humanity's home-building program.

Denver Water also provides the stores with $125 rebate forms to encourage customers to buy high-efficiency toilets. If the program is successful, Denver Water will look at continuing it, Lovato said.

Lovato has seen all kinds of toilets in all sorts of colors while working with this program. Powder blue, salmon pink, avocado and "Van Dyke Brown," Lovato said.

Habitat volunteers deliver the toilets to a trash bin at Denver Water, where all the non-porcelain parts are removed so the fixtures can be crushed, recycled and reused in road base and other construction projects.

If the program goes as planned, Denver Water expects to save 9,000 gallons per toilet per year, which amounts to about 13.5 million gallons of water total.

Zach Lovato, a Denver Water conservation technician, breaks up a 3.5 gallon-per-flush toilet to be recycled.

"We love it," said Jerry Arnold, manager of Denver's Habitat for Humanity Home Improvement Outlet. "It provides us with a way to get those inefficient toilets out of the marketplace and still make some money."

2009 Rebates

From 2007-2009, Denver Water processed more than 38,600 residential rebates as part of its accelerated conservation program. That means almost 15 percent of Denver Water's residential customers have participated in the rebate program since 2007, saving about 960 acre-feet of water annually – the amount used by roughly 2,400 households in one year.

Free audits look for leaks

Fourteen apartment complexes in Denver will save an estimated 3.2 million gallons of water a year with new high-efficiency toilets and low-flow aerators and showerheads.

The complexes, owned by Denver-based Busboom Group, also are expected to save $7,400 a year in water costs and $6,200 in sewer costs.

"Anything we can do to reduce the utility costs to our customers is a good thing," said the company's president, Jason Busboom.

In 2009, Busboom Group contacted Denver Water about performing a free audit of its 14 apartment complexes, a service Denver Water offers to all its commercial and multifamily customers. In an audit, a Denver Water conservation specialist looks for leaks, replaces old aerators and showerheads with water-efficient ones and takes inventory of all water-using appliances.

Then the conservation specialist compiles a report of water saved by replacing the aerators and showerheads and estimates the amount of water and money the owner could save by fixing all the leaks and replacing inefficient toilets with high-efficiency models. The conservation specialist also gives the owner information about Denver Water rebates and other incentives to save water and money.

Denver Water offers $125 rebates for high-efficiency toilets, which Busboom used to help pay for new toilets in the apartment complexes.

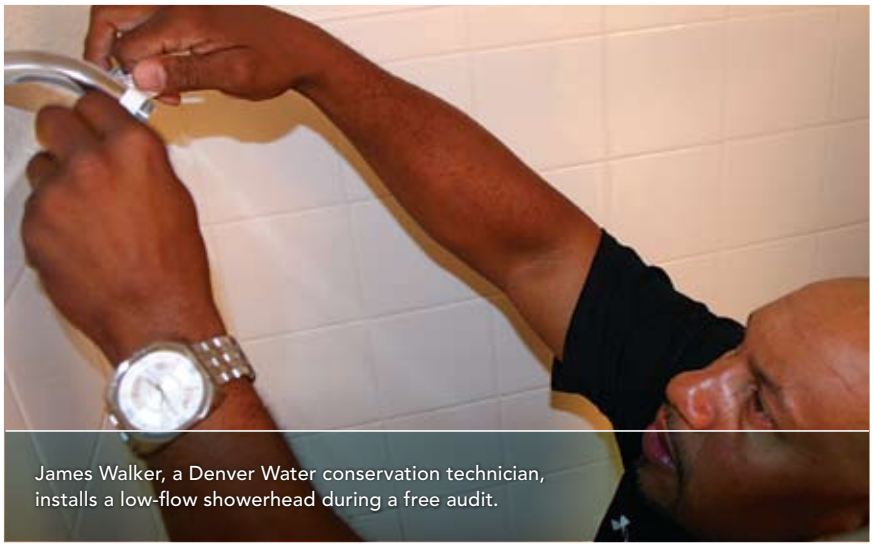
By fixing all leaks and replacing inefficient toilets with new models, Denver Water estimates that the 14 complexes are saving 3.2 million gallons of water per year, said Cindy Moe, Denver Water's industrial water conservation engineer.

The audits and rebates aren't limited to apartment complexes. Denver Water will audit homeowners associations, commercial buildings, industrial complexes – any facility in Denver Water's service area that uses water and has the potential to reduce its water usage. Denver Water also offers rebates for high-efficiency toilets, irrigation devices and other water-using fixtures.

Busboom said he hasn't had any complaints from residents, and that the high-efficiency fixtures are a good selling point to potential tenants.

Taking steps to becoming more water-efficient makes the apartments more competitive in the rental market because tenants are increasingly putting emphasis on being more environmentally friendly, Moe said.

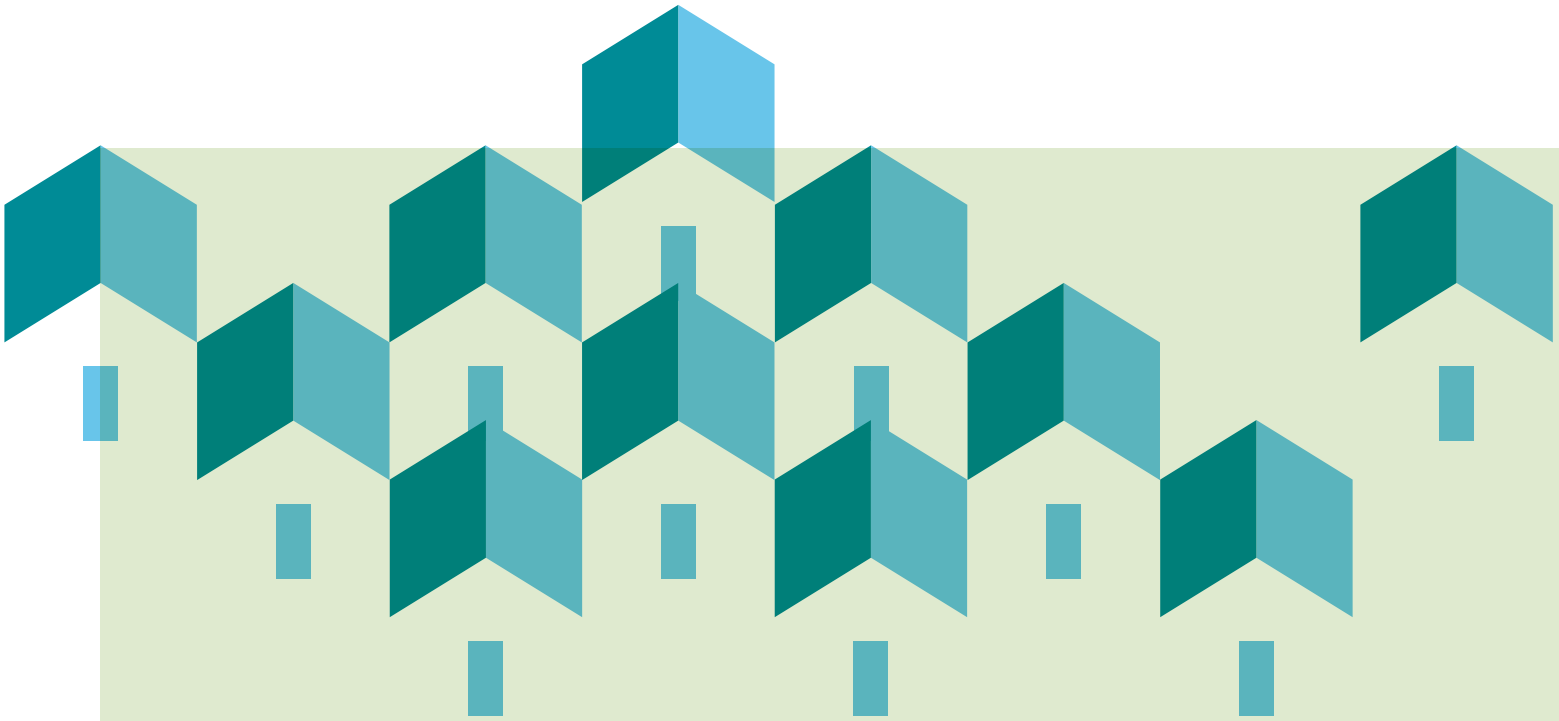
"More and more, it's the tenants asking for water-efficient fixtures," Moe said. "They want to live in a green environment."



James Walker, a Denver Water conservation technician, installs a low-flow showerhead during a free audit.

DID YOU KNOW?

Each year, Denver Water recycles about 50 tons of paper and cardboard and about 20 tons of electronic waste. It also recycles a variety of other products, such as fluorescent bulbs, batteries, aluminum, tin, plastics, various metals and more.



Building savings in the 'burbs

When governments showcase their water efficiencies, residents have an easier time following suit.

"We have to make sure governments are practicing what they preach," said Liz Gardener, Denver Water's suburban water conservation coordinator. "If people see their governments are wasting water, our conservation efforts will fall flat."

Denver Water spends millions of dollars each year helping government agencies in its suburban water districts conserve water. A snapshot of the major 2009 suburban conservation projects includes:

- **New plumbing fixtures for the Federal Correctional Institution in Lakewood.** Denver Water bought vandal-proof toilets, low-flow showerheads, high-efficiency urinals, ice machines and other water-efficient fixtures to help the prison save water. The project is still in the works, but Denver Water estimates the new fixtures will save 50 acre-feet of water a year, roughly the amount of water used by 125 households annually.
- **New high-efficiency toilets and showerheads for low-income houses managed by Metro West Housing Solutions, formerly known as Lakewood Housing Authority.** Denver Water also bought new fixtures for the agency's office. The project is expected to save about 10 acre-feet of water a year, roughly the amount of water used by 25 households each year.
- **Fifteen new high-efficiency toilets for Belmont Manor apartments in Lakewood.** The apartments, which are run by Metro West Housing Solutions, are expected to save about 56,500 gallons of water each year.
- **New high-efficiency toilets, urinals and faucets for schools in the Cherry Creek School District that are within Denver Water's service area.** A recent bond

initiative funded major renovation work in several of the district's schools, and Denver Water saw the construction work as a good opportunity to help the district save water. The new fixtures are expected to save about 60 acre-feet of water each year, roughly the amount of water used by 150 households annually.

Jeff Benjamin with Utility Services Associates looks for leaks in Cherry Creek Village Water District. Denver Water hired Utility Services Associates to look for leaks in nine suburban water distribution systems. When the leak detection survey is finished, distributors will have detailed maps of leaks that need to be fixed, preventing unnecessary water loss.

- **A leak detection survey to help nine suburban water distributors who volunteered for the project find leaks in their systems.** Denver Water hired a consultant to look for leaks in nine suburban distribution systems. When the leak detection survey is finished, distributors will have detailed maps of leaks that need to be fixed and estimates of the water loss in gallons per day, helping to prevent unnecessary water loss.

Denver Parks get a boost in improving conservation efforts

Denver Parks and Recreation can further stretch tax dollars earmarked for conserving water in local parks thanks to a Denver Water 10 percent match program.

Denver Parks and Recreation is using $17.5 million of the Better Denver Bond Program money to improve the irrigation systems in 40 of its parks. Denver Water is rebating 10 percent of that amount – $1.7 million – to help the parks department further improve its water efficiency.

"Their old irrigation systems are just falling apart," said Donna Pacetti, Denver Water's local government water conservation coordinator, who is in charge of the 10 percent match project.

The $17 million Better Denver Bond Irrigation Project – a total of 37 initiatives – is estimated to save up to 247 acre-feet of water and potentially $192,000 annually based on current rates. The goal of the project is to reduce water usage to 15 to 18 gallons of water per square foot. In parks with the most outdated infrastructure, this represents a savings of 27 percent in addition to reduced labor and repair costs.

DID YOU KNOW?

Denver Water serves a quarter of the state's population and uses about 265,000 acre-feet of water a year. That's about 2 percent of all water, treated and untreated, in Colorado.

Taken from the southwest corner of the Colorado State Capitol building, this June 1909 photo shows sprinklers watering the Capitol grounds, hopefully not between the hours of 10 a.m. and 6 p.m.

452-

HOA enjoys a flush of savings

Many of the toilets in the Cherry Creek III townhomes were installed in the 1960s.

There were avocado-green and salmon-pink commodes. Others had tanks with metal floating balls and chains that were paper-clipped together. Most of the toilets used at least 3.5 gallons of water per flush, and sometimes more thanks to their leaks.

"They were just nightmares of old toilets," said Don Ireland, president of the Cherry Creek III Homeowners Association.

Now, the homes have sparkling white latrines that use 1.28 gallons per flush and are expected to save more than 5.6 million gallons of water a year, which will reduce their water and wastewater bills by tens of thousands of dollars.

Don Ireland, president of the Cherry Creek III Homeowners Association, and his dog Max sit next to a new 1.28-gallon-per-flush toilet provided by Denver Water.

"You want to save water because of the cost," Ireland said. "But you also want to do it for the greater good, which is to help the environment. Water is a very, very precious resource."

Cherry Creek III is a southeast Denver condominium association, built about 45 years ago, with 251 units that have shared water bills. In 2009, Rick Alvarado, a Denver Water conservation technician, went to the Cherry Creek III neighborhood to investigate a series of unusually high bills. He inspected the meters and looked for leaks in the neighborhood's irrigation system but couldn't find the problem.

About that same time, he got an e-mail from a toilet supply company, offering $100 high-efficiency toilets. That sparked an idea. What if, instead of offering homeowners a standard $125 rebate for buying a high-efficiency toilet, Denver Water made it easier on everyone and bought the $100 high-efficiency toilets for the townhomes? Then Denver Water could give the homeowners association the extra $25 per toilet it would have gotten with the rebates, to be put toward installation costs. That got the ball rolling.

The homeowners association's board agreed to put additional money toward installation costs and asked that each homeowner pay only $15 for a new high-efficiency toilet.

Toilets are typically a household's largest indoor water user, and Alvarado knew that replacing 400 of the townhomes' old leaky toilets could save a substantial amount of water and may be the cause of the community's high water bills.

9.5 million gallons – the amount of water being saved each year now that Cherry Creek III has swapped inefficient toilets for 1.28-gallons-per-flush models.

"Replacing an old toilet gets savings, but replacing an old toilet that leaks really gets the savings," said Cindy Moe, a Denver Water industrial water conservation engineer.

Helping customers conserve, through rebates or programs such as this one, is cheaper for Denver Water than it is for the utility to buy additional water rights, build a new reservoir and treat more water.

"I'm concerned about our water – are we going to have enough water for everyone as the population continues to grow?" said Ireland. Conserving water is "good for the environment and good for your pocketbook."

Incentives a win-win for businesses

Alsco, a commercial laundering company, goes through a lot of water each month.

"Conservation is extremely important," said Brian Johnson, manager of the Denver branch of Alsco. "We recognize we're a big user, and if we can help, we're happy to do so."

The laundering and textile rental company has 10 commercial-sized washing machines that use cold water pipes to keep the machines' hot oil from overheating. The cold water was being circulated through the machine before being dumped, which meant about 1,000 gallons of water per machine went down the drain each day.

To prevent so much water loss, Alsco looked into ways it could make its laundry equipment more efficient. Jerome Patterson, a Denver Water conservation technician, told Johnson about Denver Water's incentive contract program, in which Denver Water pays businesses to reduce their water use at least 100,000 gallons a year.

So Alsco installed a system to recirculate that cold water into a hot water tank, saving roughly 3.4 million gallons of water annually – and earning $40,000 from Denver Water for doing so.

The incentive contract also more than covered the cost of Alsco's equipment changes, which is now saving the company $20,000 annually on its water and sewer bills.

"I was a little skeptical at first, but we had nothing to lose," Johnson said. "It's a win-win for everybody."

Denver Water typically has 10 to 12 commercial incentive contracts in the works each year, helping companies in Denver Water's service area save millions of gallons of water annually, said Cindy Moe, Denver Water's industrial conservation engineer.

Alsco employees remove laundry from a machine that has been retrofitted to save water. The commercial laundering and textile rental company saves about $20,000 annually on its water and sewer bills since making those conservation changes.

All businesses and commercial facilities within Denver Water's service area are eligible for the incentive contracts, and most companies have the ability to conserve.

"They can always do something," Patterson said. "Conservation is a way for businesses to reduce their operating costs."

INCENTIVES A
WIN-WIN FOR B

DID YOU KNOW?

A toilet is typically a household's largest water user.

Irrigation changes save HOA thousands

A Lone Tree homeowners association is saving roughly 6 million gallons of water a year after installing weather-based smart controllers on its irrigation system.

And Denver Water paid the neighborhood to do so.

"We were just blown away," said Gary Emig, president of the Carriage Club Homeowners Association, located in Lone Tree. "I'm such a proponent of this program. This is just a slam dunk."

Denver Water offers efficiency contracts to its large irrigation customers, such as homeowners associations and commercial facilities, for installing weather-based smart controllers, replacing Kentucky bluegrass with Xeriscape plants or making other modifications to reduce their water usage.

As part of the efficiency contracts, Denver Water will pay customers $7,000 per acre-foot of water saved, prorated over five years. Denver Water also offers rebates for irrigation equipment (such as weather-based smart controllers, rain sensors and rotary nozzles), up to a $1,000 rebate for material installation and labor costs, and money for landscape design assistance. Rebates and efficiency contracts are available to anyone who receives water directly from Denver Water or indirectly through one of Denver Water's distributors.

With its efficiency contract, Carriage Club expects to receive $100,000 over five years from Denver Water. The homeowners association also is saving thousands of dollars annually on its water bills by reducing its water usage.

"They're kind of our poster child," said Jeannine Shaw, a Denver Water conservation specialist who is working with Carriage Club on the program. "We're seeing more and more HOAs follow in their footsteps."

As of March, 56 entities have efficiency contracts with Denver Water, saving more than 509 acre-feet of water a year – roughly the amount of water used by 1,270 households. Fifteen contracts are in the works, Shaw said.

"It's also a lot more environmentally friendly, so we are strong proponents of conservation for both financial and environmental reasons," Shaw said.

> The controllers help plants get the right amount of water at the right time, while taking the guesswork out of developing an appropriate watering schedule.

The Carriage Club neighborhood has 430 homes, several miles of bike paths and 23 acres of open space. To help save water and meet the requirements of the efficiency contract, the homeowners association installed 12 weather-based smart controllers, which manage the landscape's watering schedule based on weather factors and water requirements for the type of landscape at the site. The controllers help plants get the right amount

Gary Emig, president of the Carriage Club homeowners association in Lone Tree, stands next to one of the neighborhood's weather-based smart controllers. Denver Water paid the homeowners association to make water-saving changes to its irrigation system.

of water at the right time, while taking the guesswork out of developing an appropriate watering schedule.

Carriage Club paid $31,000 for the new controllers and installation. In the first year after the controllers were installed, the neighborhood saved $10,000 on their water bills, earned $4,000 in controller rebates from Denver Water and received more than $15,000 in efficiency-contract payments from Denver Water – nearly paying for the new controllers in the first year alone.

"I would never have imagined saving as much water as we did, as quickly as we did," said Emig.

Before the efficiency contract, water accounted for about a quarter of the association's budget. The association's landscape company tried manually adjusting the sprinkler system every time it rained, but it wasn't an efficient process, and it was hard to keep the grass in the parks and greenbelts healthy. So Emig started looking into Denver Water's conservation programs and came across the efficiency contracts.

Emig recommended that other associations take the time to learn about Denver Water's conservation programs to help save money and water.

"This isn't too good to be true," Emig said. "The numbers are absolutely true. It'll take some work and effort, but it's worth it."

For more information about Denver Water's efficiency contract program, visit www.denverwater.org/Conservation/IncentivePrograms, or call Jeannine Shaw at 303-628-7017.

DID YOU KNOW?

Conservation technicians respond to high bill complaints from customers and to requests for indoor and outdoor audits (both residential and commercial). A sample of customers who received high bill audits during 2007 showed savings of about 10 percent compared with their usage before the audits. These audits are helping customers save an estimated 77 acre-feet of water, the amount used by roughly 190 households in one year.

Summary of Denver Water Conservation Goals (Accelerated Conservation Plan: 2007 – 2016)

Four years ago Denver Water launched an aggressive 10-year plan to speed up the pace of conservation in its service area. The goal is to reduce overall water use 22 percent by 2016 in order to provide a secure water future for Denver Water customers. The following data provides a look into the different elements of the 10-year plan.

Accelerated Conservation Target (2007 – 2016) · · · · · · 22% Reduction from Pre-Drought Use
Current Customer Demand · · · · · · · · · · · · · · · · · · · 19% Reduction from Pre-Drought Use
Remaining 2016 Conservation Target · · · · · · · · · · · · · Additional 3% Reduction from Pre-Drought Use

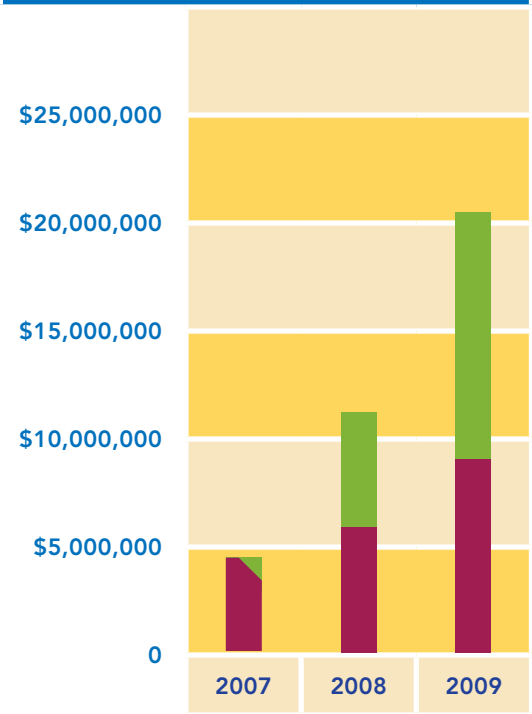
Program Activities, Incentives Paid and Estimated Savings: 2007-2009

Program	Activity Level	Primary Customer Type	Incentives Paid ($)	Estimated Savings
Conservation Outreach to City & County of Denver	46 contracts	Government	$1.33 million	240 AF
Conservation Outreach to Suburban Government / Customers	9 contracts	Government	$1.8 million	477 AF
Indoor CII Incentive Contracts	28 contracts	Commercial / Industrial	$790,000	349 AF
Cooling Tower Audits	167 audits / 114 sites	Commercial / Industrial	–	20 AF
CII and New Construction Rebates	6,308 rebates	Commercial / Industrial	$427,244	502 AF
Washing Machine Rebates	24,400 rebates	Residential	$3.65 million	640 AF
Toilet Rebates	9,100 rebates	Residential	$855,000	300 AF
Outdoor Residential Rebates	5,100 rebates	Residential	$65,000	18 AF
Low Income Fixture Replacement	5,573 audits / 5,526 toilet retrofits	Residential	–	300 AF
Irrigation Efficiency Incentive Contracts	15 contracts	Commercial / Industrial	$126,000	128 AF
High Bill Audits	891 audits	Residential	–	77 AF
Water Waste Rules Enforcement	7,000 stops	All	–	108 AF
				Total acre-feet savings: 3,159 AF

Incentives are available to Denver Water customers and customers who receive water from Denver Water's distributors.

Denver Water enforces its summer watering rules with a roving team of Water Savers. In 2010, four of the 11 Water Savers are patrolling on bikes, while the other Water Savers drive cars reminding customers that waste is out.

Conservation Spending (on 2009 basis)

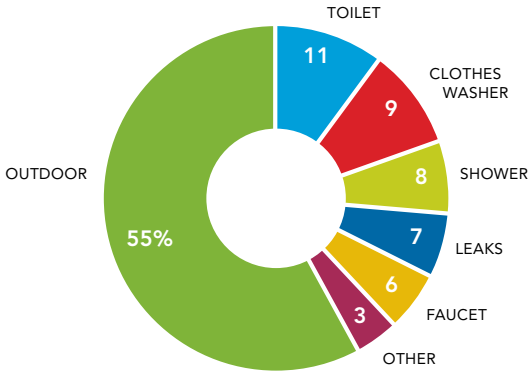


FIRST THREE YEARS OF THE 10-YEAR ACCELERATED CONSERVATION PLAN

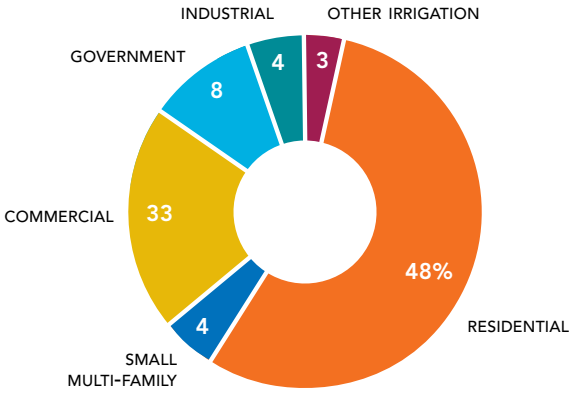
CUMULATIVE

CONSERVATION SPENDING

Single-Family Water Use



Retail Treated Water Sales



DID YOU KNOW?

Creating a culture of conservation in Denver dates back to 1936 when Denver Water advertised on street trolleys asking customers to help save water.

Auraria Campus cuts water use with new fixtures

Denver Water is supplying Auraria Campus with hundreds of new water-efficient fixtures to help the higher education center save about 30 acre-feet of water each year – roughly the amount used by 75 households annually.

Auraria Campus is home to Community College of Denver, Metropolitan State College of Denver and the University of Colorado at Denver. Most of the toilets on the downtown Denver campus used at least 3.5 gallons per flush or more, said Donna Pacetti, Denver Water's local government water conservation coordinator, who is in charge of the project.

In the next year, plumbers will install 350 toilets, 175 urinals and 250 faucets.

Michael Cushman installs a high-efficiency toilet at the Auraria Campus.

Plumb Green, Save Blue

In 2009, Denver Water partnered with GreenPlumbers USA to give high water users a chance to lower their water bills. In the Plumb Green, Save Blue pilot project, Denver Water targeted homes that were using between 120,000 gallons and 400,000 gallons of water indoors each year – more than 30 percent higher than water-efficient homes.

GreenPlumbers USA®
CREATING SUSTAINABLE COMMUNITIES

Denver Water offered to buy each participating home a new high-efficiency toilet, a showerhead and aerators for every faucet in the house. Then Denver Water paid plumbers who are accredited by GreenPlumbers USA, a national organization that teaches plumbers about water efficiency, to install the fixtures and look for water waste at each house. Each household was responsible for $49 of the cost.

So far, the 120 homes that participated are seeing a 50 percent reduction in their water costs. "We were enormously surprised," said Stacy Smith, a Denver Water conservation specialist in charge of the program. "Those are huge savings."

Denver Water reused old billboards for its 2010 Use Only What You Need campaign to help remind customers that waste is out.

Denver Water rebates reach new heights

One of Denver's newest skyscrapers received almost $92,000 in Denver Water rebates for installing high-efficiency toilets in its new condos.

The 42-story Spire in downtown also received about $20,000 from Denver Water for installing submeters in each unit to help residents better track their water usage.

Denver Water offers customers $125 rebates for buying high-efficiency, 1.28 gallons-per-flush toilets. The rebates also are available to developers to encourage them to install the more efficient 1.28-gallons-per-flush toilets rather than 1.6-gallons-per flush toilets, which are the standard fixtures.

Spire was Denver Water's largest new construction rebate project in its rebate program history, said Stacy Smith, conservation specialist in charge of the project. In total, Denver Water gave Spire rebates for 733 toilets and 497 submeters.

Waste is out

It's that time of the month to check your sprinkler settings.

Denver Water's award-winning *Use Only What You Need* campaign entered its fifth year this spring, and Denver Water wants customers to understand that if they simply adjust their sprinklers at least once a month to account for varying weather patterns and seasonal changes, they stand to save a lot of water.

The 2010 campaign reminds customers that waste is out. Quirky bill inserts, eye-catching light rail trains and recycled billboards (photo left) remind customers to use only what they need.

Demonstration garden flourishes

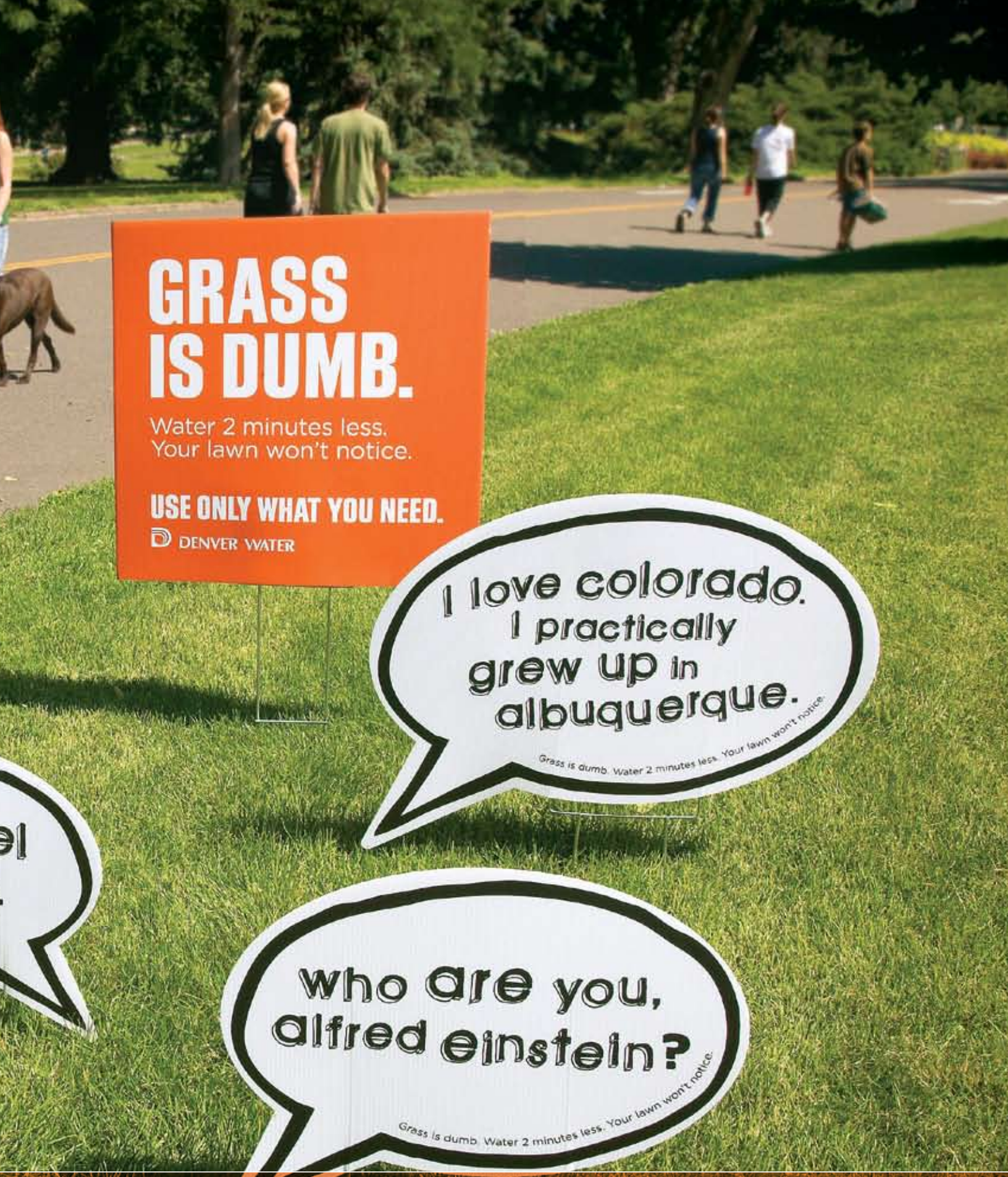
Denver Water's first off-site Xeriscape demonstration garden is flourishing in Stapleton's Central Park, offering passersby a chance to learn more about low-water-use plants and successful landscape design.

Stapleton's 80-acre Central Park, Denver's third largest, seemed like the perfect place for Denver Water to put a half-acre Xeriscape demonstration garden.

The garden opened in 2008, but plants continue to be added. Plant stakes identify the different types of plants that thrive in the Front Range, and the garden also highlights sustainability by creating terrace walls cut from the airport's old concrete runways.

Parking is available next to the Xeriscape garden at 33rd Ave. and Alton Court.

The Use Only What You Need campaign helps Washington Park visitors understand that "Grass is Dumb." The 2009 campaign urged residents to water their lawns two minutes less.


GRASS
IS DUMB.
Water 2 minutes less.
Your lawn won't notice.
USE ONLY WHAT YOU NEED.
DENVER WATER
I love colorado.
I practically
grew up in
albuquerque.
Grass is dumb. Water 2 minutes less. Your lawn won't notice.
el
who are you,
alfred einstein?
Grass is dumb. Water 2 minutes less. Your lawn won't notice.

Recycling Plant upgrades

During the past five years, the Denver Water Recycling Plant has made changes to its operations to reduce operating costs and improve the quality of its recycled water.

By making these treatment changes, Denver Water also reduced sodium, chloride and sulfate levels in recycled water, which is better for trees and other vegetation. The changes also make the plant more efficient and ensure customers receive a consistent quality of water.

Metro Wastewater, which treats the water before Denver Water's Recycling Plant receives it, also plans to make treatment upgrades in the next few years. Those upgrades may help Denver Water further reduce chemical dosages required for treatment, cut costs and provide improved water quality.

Employees in the Denver Water Recycling Plant stand inside the plant, which was built in 2004. Recycled water pipe is colored purple to help distinguish it from potable water pipe.

The right water, the right use

Lawns don't need drinking water to stay healthy.

"Does it really make sense to put our drinking water on grass?" said Abigail Holmquist, Denver Water's recycled water program manager. "It makes sense to use nonpotable water for nonpotable uses. That's why we all don't drive Ferraris. A Honda works just fine."

In 2004, Denver Water opened its recycling plant – the largest water recycling system in the state – and continues to expand that system each year to free up more and more drinking water for other purposes.

"For Denver Water, it was a major milestone in our history," said Brian Good, Denver Water's director of Operations and Maintenance, who was the recycling plant's supervisor when it opened. "It was the first time we branched out with another type of water supply."

The Denver Water Recycling Plant allows Denver Water to capture treated wastewater from Metro Wastewater's treatment plant. Denver Water retains rights to a significant amount of water that Metro Wastewater treats and discharges into the South Platte River. Before the recycled water system was built, much of this water was lost downriver.

Now Denver Water reclaims a portion of that wastewater, sends it to the nearby recycling plant, and distributes it to customers for irrigation, industrial and commercial operations that don't need the high quality of drinking water.

Once the recycled water distribution system is complete, expected to happen over the course of the next decade, it will free up enough drinking water to serve almost 43,000 households.

Using recycled water also helps delay the need to divert more water from upstream watersheds or develop new, expensive mountain water supplies to meet the future demands of Denver Water's growing customer base.

"We've essentially bought futures in water by building a recycling plant," Holmquist said.

Xcel Energy was the first customer to receive recycled water, soon followed by the Denver Zoo, city golf courses and various parks. In 2009, Denver Water delivered about 6,000 acre-feet of recycled water to 27 customers, freeing up enough drinking water to serve roughly 15,000 households.

"I think we'll look back someday and realize how monumental of a step building a recycling plant was for us," Good said. "It becomes more important every year as we expand our recycled water system."

For more information, visit www.denverwater.org/WaterQuality/RecycledWater.

The Denver Water Recycling Plant meets the most stringent water quality standards for recycled water, but it should not be consumed. Still, incidental contact with recycled water, such as walking on grass after it has been watered, is safe for people and pets. Signs are posted in parks and other outdoor areas that use recycled water.

Golf course goes green with recycled water

CommonGround Golf Course has healthy greens, neatly trimmed fairways and a rough that blends in seamlessly with its surroundings. It's also kept green with recycled water – for about a fourth of the price of potable water.

Developers of CommonGround Golf Course, which opened in 2009 on the site of the former Mira Vista Golf Course southeast of Lowry, used recycled asphalt for the cart paths and turned old trees into mulch and wood chips to help lessen the course's impact on the environment.

"Most people have no idea we're using (recycled) water," said Tracy Richard, director of agronomy at CommonGround. "You'd never know by looking at the golf course."

When CommonGround Golf Course was redeveloped, crews took steps to make the course as water-efficient and environmentally friendly as possible.

They hooked onto Denver Water's recycled water system so the course could irrigate with recycled water. They installed a weather station to help adjust the course's irrigation schedules, planted low-water-use grass in the rough and transplanted more than 100 trees from the site's former golf course.

"Golf courses have a bit of a reputation as being water hogs," Richard said. Improving that reputation by using recycled water and reusing materials from the old course "is clearly the environmentally friendly thing to do."

Denver Water continues to add customers to its recycled water system each year. Once the recycled water system's build-out is complete, the project will supply more than 5 billion gallons of recycled water annually for irrigation, industrial and commercial uses.

Recycled water, which is treated to state health standards but should not be consumed, is cheaper than treated drinking water. Richard said CommonGround uses about 90 million gallons of water each summer to irrigate its 130 acres of turf. It pays less than 90 cents per thousand gallons of recycled water.

A Denver golf course that uses potable water to irrigate would have to pay $4 per thousand gallons of water in the summer – more than four times the amount charged for recycled water.

Despite the discounted rate for using recycled water, Richard said the course makes every effort not to waste water. "We're still trying to conserve and use water judicially," he said.

CommonGround built a pond on the course that can store about 20 acre-feet of recycled water before it is pumped to the course's irrigation system. The irrigation system is automated and adjusts according to weather and precipitation readings from the course's weather station. Members of the grounds crew inspect the turf, watch for over- or under-watered areas and look for places where the sprinkler system may be malfunctioning.

"We don't trust our irrigating completely to computers," Richard said. "There's still no substitute for seeing first-hand what turf looks like."

They also use successful cultural practices, such as aerating the soil and using proper amounts of fertilizer and calcium, to keep the grass and soil healthy. In 2009, the golf course partnered with Colorado State University in a two-year study to determine what changes occur when soil once irrigated with potable water is later irrigated with recycled water.

A Denver golf course that uses potable water to irrigate pays more than four times the amount charged for recycled water.

Richard said the course's owners, the Colorado Golf Association and the Colorado Women's Golf Association, proved they could build a golf course using materials on hand and recycled water, "and still have an outstanding golf course at the end of the day."

CommonGround Golf Course irrigates its 130 acres of turf with recycled water from Denver Water.

Study gets the dirt on recycled water's effects on soil

Colorado State University is almost finished with a multi-year study on the effects of recycled water on soil.

Because recycled water is a different quality than potable water, Denver Water funded this study as one way to provide its recycled water customers with additional resources for managing landscapes irrigated with recycled water.

The results of that study will help park managers, golf course operators and other large-scale irrigators create a healthy landscape while using recycled water.

In 2004, Colorado State University researchers collected soil samples from 10 parks, school grounds and golf courses that had just started receiving Denver Water's recycled water for irrigation. Five years later, the researchers returned to the same areas and resampled the soil.

The samples were tested for several variables, including texture, pH, organic matter, salinity, sodium and chloride. Because recycled water has different characteristics than drinking water, the results of the study will help irrigators better manage the amount of fertilizer and other nutrients to add when caring for their lawns, helping to create healthy, green landscapes.

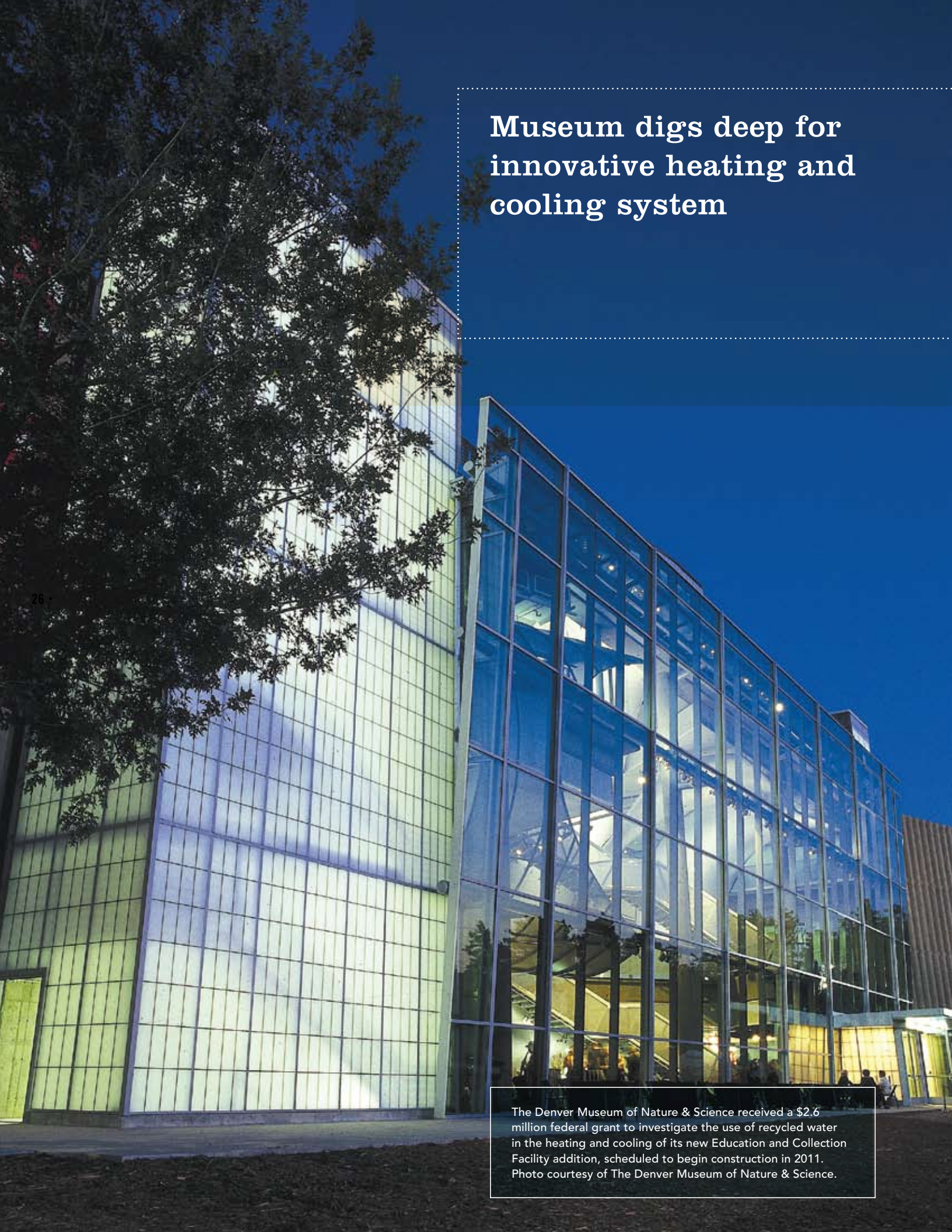
Denver Water also commissioned a tree health study in 2009. A tree pathologist currently is evaluating the health of trees in landscapes that are irrigated with recycled water and comparing those results to trees in landscapes irrigated with potable water. Just like the soil research, the tree study will give Denver Water data that can help recycled water customers better manage their landscapes.

Information on these reports will be available at: www.denverwater.org/WaterQuality/RecycledWater/RecycledWaterPlantLife.

DID YOU KNOW?

90 cents – the cost of using 1,000 gallons of recycled water. That's about a fourth of what it would cost irrigation customers to irrigate with potable water.

Museum digs deep for innovative heating and cooling system



The Denver Museum of Nature & Science received a $2.6 million federal grant to investigate the use of recycled water in the heating and cooling of its new Education and Collection Facility addition, scheduled to begin construction in 2011. Photo courtesy of The Denver Museum of Nature & Science.

The Denver Museum of Nature & Science wants to use recycled water to efficiently heat and cool its new addition.

And thanks to a recent $2.6 million federal grant, the museum is one step closer to designing and building that innovative system.

The museum's federal grant was part of a much larger nationwide push to encourage research into geothermal technology. In October, the U.S. Department of Energy announced it would award $338 million in Recovery Act funding to 123 projects in 39 states that will help identify and develop new geothermal projects.

The Denver Museum of Nature & Science will use the grant – which it will match with funds from a recent bond initiative and pro-bono services from Denver Water and Geo-Energy Services – to design and study a ground source heat pump system for heating and cooling its new Education and Collection Facility addition, scheduled to begin construction in 2011.

A ground source heat pump system pumps heat to or from the ground using the earth as a heat source (in the winter) or a heat sink (in the summer). This design takes advantage of the moderate temperatures in the earth to boost efficiency and reduce the operational costs of heating and cooling systems, typically resulting in energy savings of 50 to 70 percent.

Instead of using a typical closed-loop system of shallow wells to dissipate heat from the building, the museum plans to use water from Denver Water's recycled water system to circulate through its heating and cooling system before returning that water to the recycled water system, said Dave Noel, vice president of operations for the museum.

The water would travel through clean, secure pipes in the museum to prevent contaminants from reaching Denver Water's recycled water system.

The museum still needs to study whether the ground source heat pump system would work with Denver Water's recycled water system, but if it does, it would cut installation costs at least in half, eliminate the large footprint required for a traditional ground source heat pump system and reduce the building's energy consumption by 30 to 60 percent.

If the system works as planned, it will create a new way for customers to use recycled water. This project will produce data and information on the technical aspects, design requirements and construction work behind the system, which will come in handy for customers who are considering installing a similar system, said Abigail Holmquist, Denver Water's recycled water program manager.

As part of the five-year project, the museum will study whether the system would be feasible, build the system, study it for two to three years, provide annual reports on energy savings and other data, and develop a nationwide awareness campaign to promote the ground source heat pump system in urban areas with access to recycled water.

DID YOU KNOW?

Geothermal (adjective) Having to do with the heat of the Earth's interior.
Source: Webster's New World College Dictionary

Parks convert and conserve

Four parks in the Lowry and Montclair neighborhoods were converted to recycled water in 2009, part of Denver Water's growing effort to free up more water for drinking purposes by using recycled water for irrigation needs.

Crescent, Denison, McNichols and Verbena parks were added to Denver Water's recycled water system last summer.

These join the 13 Denver parks already being irrigated with recycled water, making a total of 552 acres of parks on recycled water. In addition to recycled water conversions, Denver Parks and Recreation is improving irrigation systems at 37 parks through the Better Denver Bond Project, an infrastructure bond program. Through these irrigation improvements and conversions to recycled water in these 17 parks, Denver will save more than 450 million gallons of drinking water annually.

In 2010, Denver Water plans to continue to expand the number of parks and school grounds on recycled water, as well as other open spaces and school grounds in the Lowry and Stapleton neighborhoods.

Once Denver Water's recycled water system is complete, the project will supply more than 5 billion gallons of recycled water every year for irrigation, industrial and commercial uses, freeing up enough drinking water to serve about 45,000 households a year.

Denver Water will save more than 450 million gallons of drinking water annually through these conversions.

Parks and golf courses that use recycled water are clearly marked with signs. In addition, some irrigation valve boxes and sprinkler heads are purple, which is the same color as the pipes used to transport recycled water.

Crescent Park was one of four parks to be converted to recycled water in 2009.

Crews install recycled water pipe in 2009 for Crescent Park.

Recycled water system expanding in 2010

Denver Water's engineers have been busy designing new recycled water facilities that will extend service to more customers in the Lowry and Stapleton neighborhoods and provide new service to the Montbello and Capitol Hill areas.

Lowry and Stapleton already use recycled water in several parks and open spaces, and in 2010, Denver Water will install new recycled water mains to provide irrigation service to eight additional parks and school grounds. These customers have a combined water demand of approximately 75 acre-feet per year, which will free up enough drinking water to serve approximately 200 households.

Denver Water also has long-term plans for serving recycled water to parks and school grounds in the Montbello and Capitol Hill areas. A large pipeline project that will move recycled water from Stapleton to 56th Avenue and Chambers Road will begin construction mid-2010 and is expected to be complete near the end of 2011.

Denver's Water's recycled water system currently serves 27 different customers.

Also, although recycled water facilities are available in the Capitol Hill area, irrigation customers have not been able to receive recycled water because of low water pressure. In coordination with customers in that area, Denver Water has started designing a major pump station that will provide recycled water at a higher pressure to large irrigators in the area. The design is expected to be complete in fall 2010 and construction will begin shortly thereafter. Customers are expected to begin receiving recycled water in spring 2012.

In addition to Denver Water's recycled water project, East High School will be tapping into Denver Water's recycled water system for irrigation and the Denver Zoo will be expanding its use of recycled water in the new Asian Tropics exhibit that is under construction.

DID YOU KNOW?

- Denver Water's recycled water distribution system has more than 30 miles of pipe underground.
- The most water Denver Water's Recycling Plant produced in one day is just over 20 million gallons.
- In 2009, customers used 6,000 acre-feet of recycled water, freeing up enough drinking water to serve roughly 15,000 households.
- Denver Water operates the largest recycled water system in Colorado.
- Recycled water has been used for more than 100 years in certain parts of the United States.
- Some famous recycled water users include Pebble Beach Golf Course, E. & J. Gallo Vineyards and the San Antonio River Walk.

An American White Pelican lands gracefully at Denver Water's Antero Reservoir, located in Park County.

Engrossed in new supply

Denver Water needs more water.

Even with customers' impressive conservation efforts and Denver Water's new recycled water treatment plant and distribution system, Denver still faces a shortfall in water supplies starting in 2016.

To help meet those future needs, Denver Water has proposed the Moffat Collection System Project. The project would more than double the capacity of Gross Reservoir, located west of Boulder, providing Denver Water with 18,000 acre-feet of additional supply – enough water to serve about 45,000 households annually.

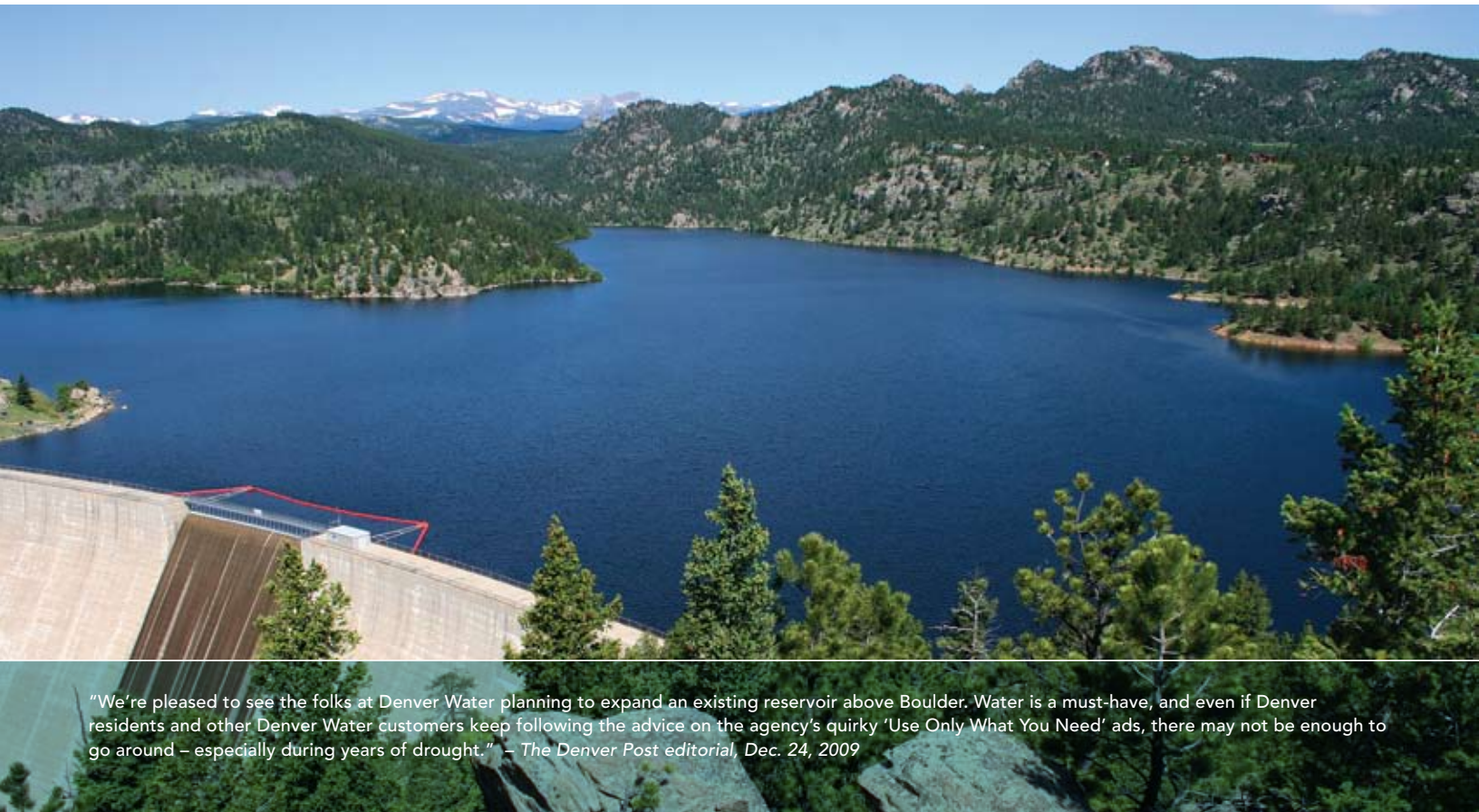
"As we look at the past, we were doing conservation," said Travis Bray, the project manager. "As we look at the present, we are doing conservation. As we look to the future, we are doing conservation. But even with our conservation efforts, we still need more supply."

If approved, the project would help resolve major challenges facing Denver Water's entire collection system. It would address an expected water supply shortage, help customers through future droughts, and provide a safety net if problems arise on the south end of the system (as the Hayman and Buffalo Creek fires highlighted in recent years).

Almost a decade ago, Denver Water began studying 300 options to increase its water supply. Potential projects ranged from enlarging Eleven Mile Reservoir, pulling more water out of Dillon Reservoir, buying agricultural water rights and developing an indirect potable reuse system.

After years of studying each project's logistical, technical and financial requirements, as well as potential impacts to the environment, the U.S. Army Corps of Engineers narrowed the list of possible supply projects to five alternatives. Of those five supply alternatives, enlarging Gross Reservoir would deliver the most benefits at the least cost and with similar environmental impacts compared to other alternatives, Bray said.

"It will help ensure a reliable water supply every year for our customers," Bray said. "Not just in drought years, but in all years."



"We're pleased to see the folks at Denver Water planning to expand an existing reservoir above Boulder. Water is a must-have, and even if Denver residents and other Denver Water customers keep following the advice on the agency's quirky 'Use Only What You Need' ads, there may not be enough to go around – especially during years of drought." – *The Denver Post editorial, Dec. 24, 2009*

Supplying water today and tomorrow

Denver Water proudly serves high-quality water and promotes its efficient use to 1.3 million people in the city of Denver and many surrounding suburbs. Established in 1918, the utility is a public agency funded by water rates, new tap fees and the sale of hydropower, not taxes. It is Colorado's oldest and largest water utility.

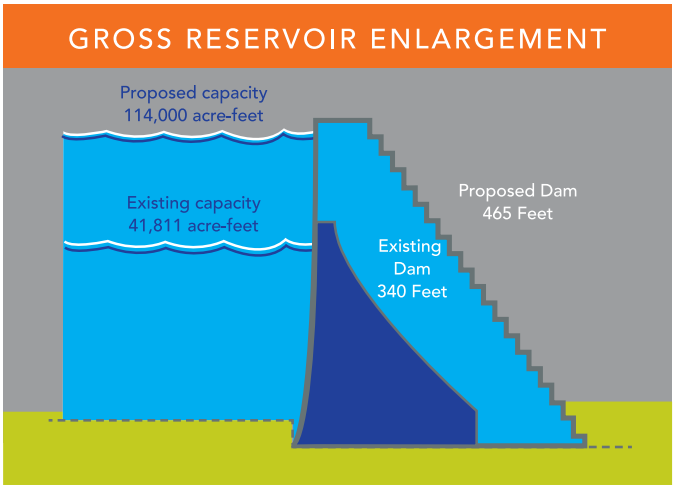
The majority of Denver's water comes from rivers and streams fed by mountain snowmelt. The South Platte River, Blue River, Williams Fork River and Fraser River watersheds are Denver Water's primary water sources, but it also uses water from the South Boulder Creek, Ralston Creek and Bear Creek watersheds.

Denver Water produces one-third of the state's treated water supply, which is about 234,000 acre-feet per year. An acre-foot equals 325,851 gallons of water and is roughly the amount of water used by 2 ½ households for one year. Denver Water serves about 265,000 acre-feet of water a year, which is about 2 percent of all water, treated and untreated, in Colorado.

SUPPLY

2 percent – the percentage of all the state's water, treated and untreated, used by Denver Water.

In late October 2009, the U.S. Army Corps of Engineers released a Draft Environmental Impact Statement for the Moffat Project, which evaluates the impacts of the project on environmental and economic resources. The Corps held public meetings about the Draft Environmental Impact Statement in Boulder, Denver, Grand County and Summit County. Now the Corps is studying the public comments and working on the Final Environmental Impact Statement, which is expected to be released later this year. After review of the Final Environmental Impact Statement, the Corps will release its decision about whether or not to issue a permit.



Without the project, Denver Water would face major challenges.

"In the event of an emergency, we may not be able to meet the needs of our customers," Bray said. Without it, "we'll be less reliable, more vulnerable and more at risk of running out of water in the event of an emergency."

Gross Dam Quick Facts

- Denver Water wants to enlarge Gross Reservoir by raising Gross Dam 125 feet, which will provide an annual 18,000 acre-feet of water supply, enough to serve about 45,000 families.
- Gross Reservoir is located on South Boulder Creek, 26 miles northwest of Denver.
- The gravity arch-concrete dam was completed in 1954 and rises 340 feet above the streambed.
- Gross Reservoir has a surface area of 440 acres and nearly 11 miles of shoreline.

DID YOU KNOW?

Gross Dam and Reservoir were named for Dwight D. Gross, who formerly served as chief engineer of Denver Water.

Gravel pit makeover yields new storage

Denver Water filled Miller and Cat reservoirs with water last summer, making them the first two Denver Water gravel pits to be turned into water storage sites.

The Downstream Reservoir Water Storage Project, which has been in the works for a decade, allows Denver Water to store and release reusable water in its system through the use of old gravel pits that have been remodeled to store water. The project allows Denver Water to keep upstream water while releasing water from the gravel pits north of the city to meet downstream water requirements.

There are three complexes in the project, which have an estimated total storage volume of 33,192 acre-feet of water. Miller Reservoir, south of Interstate 76 and west of Colorado Boulevard, is part of the South Reservoir Complex. Its neighbor to the west, Cat Reservoir, also is part of the South Reservoir Complex. Both were full by the end of the summer.

Denver Water plans to begin operating the North Reservoir Complex in 2016 and the Lupton Lakes complex in 2020.

In the mid 1990s, the South Adams County Water & Sanitation District received money from the U.S. Army and Shell Oil to acquire water to replace the water that had been tainted from the nearby Rocky Mountain Arsenal. Those funds allowed the district to work with Denver Water

on an agreement in which Denver Water would supply 4,000 acre-feet of potable water to the district if the district provided 8,000 acre-feet of downstream storage to Denver Water.

Denver Water had to secure water rights, remodel the gravel pits to serve as storage sites and install pumps to move water before it could operate the reservoirs.

Though Denver Water has been reusing water by exchange since the early 1970s, this is the first time Denver Water has put return flow into reservoirs directly.

Now that both reservoirs are full, they are a prime habitat for waterfowl, raptors and other wildlife.

DID YOU KNOW?

Denver Water's seven hydroelectric plants have the ability to produce more energy than Denver Water consumes in its pumping stations and water treatment facilities.

Gravel pit guardian

Manuel Bachicha's father spent seven years as a section foreman for the railroad, living where he worked and overseeing a section of railroad that stretched from northern New Mexico to southern Colorado.

Bachicha has since followed in his father's footsteps; though instead of overseeing a section of the railroad, he lives at and oversees Denver Water's newest reservoirs.

"It just sort of happened that way," he said with a laugh.

Bachicha was born and raised in Trinidad, but spent parts of his childhood in northern New Mexico. In the early 1970s, after graduating from high school in Trinidad and spending a year in college, he decided to move to Denver.

"It was a big adventure," he said.

He got a job in a Denver factory that constructed semi-trailers, but after 13 years, the plant closed and moved to Nebraska. Bachicha was then hired at Denver Water as a utility worker on the High Line Canal, where he worked for 18 years.

A few years ago, he saw an opportunity to work as a caretaker for Denver Water's recently purchased gravel pits, also known as downstream reservoirs, north of the city. The reservoirs are part of the Downstream Reservoir Water Storage Project, which will help Denver Water store and reuse water from the Western Slope.

Years ago, once gravel companies finished mining the areas, they left giant holes in the ground suitable for water storage, which Denver Water bought. There are three complexes in the project: the reservoirs in the first complex, Miller and Cat, opened last year. The reservoirs in the other two complexes won't be ready for water storage for another five to 10 years.

For the past four years, Bachicha has overseen the transformation of gravel pits to reservoirs, meeting with contractors, mowing tall grasses around the former gravel pits – everything from being a "heavy equipment operator to ditch digger," he said.

"I've been able to see these reservoirs being built from the ground up," Bachicha said. "I never realized all that goes into building a reservoir."

Demand planning answers tough questions

How fast will our population grow? Will people live close together, in apartments and duplexes with patios and flower pots, or will they favor large homes, with spacious, lawn-covered lots?

Where will people work? Clustered together in downtown office buildings, or spread apart in suburban office parks, or at home?

And how much water will they need? Denver Water's Demand Planning section focuses on answering those questions by using detailed projections to figure out how much water customers will need in the future. It's an ever-changing science, but it's a crucial job.

"We don't want to build infrastructure we don't need," said Mary Price, a planner in Denver Water's Demand Planning section. "At the same time, we don't want to be caught off guard and not do the infrastructure upgrades we need."

Data from Demand Planning has helped Denver Water plan for future necessary projects, including its 10-year, $1.3 billion capital plan. Demand Planning's data also showed the need for Denver Water's Moffat Collection System Project, which would allow Denver Water to supply customers with an additional 18,000 acre-feet of water each year.

To help detail those future water needs, Demand Planning uses data from the Denver Regional Council of Governments (DRCOG) to help predict how many people will live or work in Denver Water's service area in the future. Then Denver Water pairs those predictions with complex and detailed models to determine how customers use water. Is their water use affected by household size? Household income? Lot size? Weather? Water rates? How many jobs will be added, and how much water will those workers need?

Denver Water estimates that between 2010 and 2050, Denver Water's service area will increase from about 1.3 million people to 1.7 million people.

By using data from DRCOG and BBC Research and Consulting, Denver Water estimates that between 2010 and 2050, Denver Water's service area will increase from about 1.3 million people to 1.7 million people – about a 40 percent increase.

At the same time, more businesses are expected to move to Denver.

Between 2010 and 2050, employment in Denver Water's service area is expected to increase by 50 percent, from 940,000 to 1.4 million jobs. Much of that growth is expected in the downtown area, which will affect the way Denver Water upgrades infrastructure in that area.

And people are conserving more than they have in the past. Customers are using about 18 percent less water than they did before the 2002 drought, even though there are

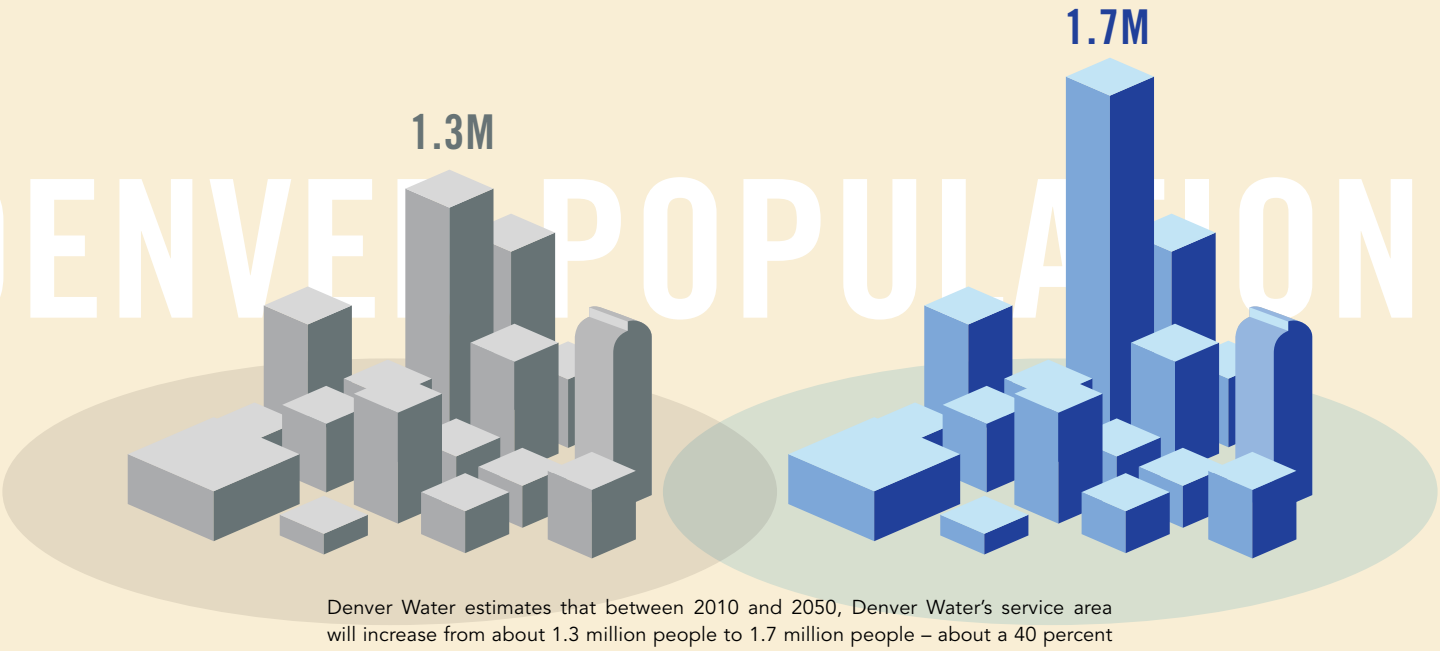
10 percent more people living in Denver Water's service area. Rather than taking the data at face value, the Demand Planning section questions if conservation savings will hold steady, if customers will continue conserving or if the green movement is merely a fad.

"One important job is to find the potential for future conservation savings," said Greg Fisher, Denver Water's manager of Demand Planning. "Conservation is such an important necessity for us to meet future needs."

Those predictions and data models are crucial in helping Denver Water create long-term plans to ensure customers always have the water they need.

"Our primary mission is serving our customers," Fisher said. "Figuring out how much water they'll need in 20, 30, 50 years is very important."

DENVER POPULATION



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2010 DENVER WATER'S SERVICE AREA **2050**

DENVER JOBS

DID YOU KNOW?

Denver Water's leak detection program saved the utility more than $130,000 in 2009 by pinpointing leaks and preventing water loss.


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