

WATER CONSERVATION AND REUSE AWARDS

Each year, the Texas Section AWWA Conservation and Reuse Division recognizes those who have demonstrated excellence in Water Conservation and Reuse Practices.

***Large Utility Direct Program:* City of Austin Innovative Commercial Landscape**

The recently adopted Innovative Commercial Landscape Ordinance is aimed at making beneficial use of stormwater to help offset supplemental potable irrigation within the Austin city limits. All new commercial, multifamily, and institutional projects will be required to direct stormwater to at least 50 percent of their required landscape either through passive or active means. With this change also comes a change in what must be irrigated. Developers may now choose to use temporary irrigation to establish native and adapted landscapes on the site's peripheral areas which contrasts the previous code language which mandated a permanent irrigation system. Compliance with the ordinance can be met in a variety of ways and should foster new and creative ways to maintain landscapes with less potable water.

Landscapes in the commercial setting are needed for reasons ranging from heat island abatement to beauty, but in such a harsh environment as a parking lot median, inputs can be high. This is primarily seen in water use. Raised islands and landscapes shed water, both natural and supplemental, onto hardscapes and then off site. Not only does this decrease the impact from a beneficial rain event, but also leads to numerous water waste violations in which potable water is hurried into storm drains and off site.

Commercial connections account for less than 10 percent of Austin Water connections, but roughly 40 percent of water waste reports are aimed at commercial properties. At council's request, city staff explored the idea of beneficial stormwater use on commercial sites and found that through design changes such as inverting medians and rethinking the urban landscape, rainwater and treated water can be used more efficiently leading to a decrease in potable water consumption.

The process of creating the Innovative Commercial Landscape Ordinance involved input from numerous public and private sources with a variety of expertise. Horticulturists, landscape architects, irrigators, maintenance personnel, geologists, planners, and engineers all contributed to the ordinance before being unanimously passed by city council. A portion of the design community was skeptical that landscapes under the new ordinance couldn't thrive and if there would really be a decrease in water usage.

Low Impact Development sites have been developed around the nation and although central Texas has a unique climate and rainfall pattern, some forward thinking developers had already shown ideas, such as directing stormwater to landscapes, can work. The ordinance allows for multiple methods of compliance including overland flow (either to traditional landscapes or innovative water quality controllers), rainwater harvesting, disconnected downspouts, retention irrigation or leaving a native area undisturbed. Each of these options, along with the landscape manager, will have different effects on water savings, but an introductory savings estimate was calculated to be between 0.18 and 0.31 mgd after ten years of building under the new ordinance.

Cost to the developer and the building inhabitant was also considered. While both construction and maintenance costs will rely heavily on the site and the design, Austin's Neighborhood Housing and Community Development's affordability impact statement states that the ordinance will have no impact on affordability. In one case study, rain gardens were used to offset the need for concrete in the sedimentation pond which resulted in landscape development savings of 48 percent.

Within the ordinance is a requirement that staff

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reconvene in two years to assess the ordinance for successes and failures. In the short term, success of the ordinance will be decided on effective design, plant survival, plant health, proper drainage and speed of plant establishment. Water savings will be hard to judge in the first two years, but once multiple sites are established and experience

several years of changing weather, water usage on similar pre ordinance and post ordinance sites can then be compared. As sites are designed under the ordinance, dialogue will need to take place between all facets of the design community, ensuring a holistic approach to landscape design which utilizes resources efficiently.

***Small Utility Direct Program:* City of College Station Parks & City Facilities Irrigation Conservation**

In 2009 the City of College Station began looking for ways to not only reduce expenses, but also set an example for citizens by modeling more efficient landscape water use practices. Staff from the Parks and Recreation (PAR) and Water Services departments met with the City Manager's office to review water use at all City facilities and prioritize certain city sites for irrigation system inspections and repairs.

Detailed reports of water usage for every City facility with an irrigation system were collected, and the Water Auditor met with Parks & Recreation staff to inspect irrigation systems at the highest-use facilities.

The end result of numerous inspections of city irrigation systems was a monthly report presented to City Council comparing predicted vs. actual water use for the month and for the 12-month period preceding the report. The report contains water usage for irrigation of City facilities, neighborhood parks, athletic fields, and other irrigated areas such as street medians. For each facility, the report includes four data points on irrigation water usage:

- Total in FY 2009 vs. Actual for previous 12 months;
- Budgeted for previous month vs. Actual for previous month.

Predicted water usage comes from water budgets for each landscape site using the Texas Landscape Irrigation Auditing and Scheduling Software developed by the Irrigation Technology Center. The software uses the amount of irrigated acreage, historical weather data, as well as soil and vegetation characteristics to produce a site specific

water budget. Each site is analyzed using aerial photographs and GIS calculations for irrigated acreage.

For any site that has higher than predicted water usage, Water Services and PAR meet to determine the cause of the high usage. In some cases higher than normal usage is due to actual rainfall in a particular month being less than the historical average rainfall used to predict the water budget for a particular site. In other cases high usage is due to irrigation system leaks, which are repaired by PAR and reported to Water Services as they happen, so that can be noted in the monthly report.

The report is presented to City Council on a monthly basis, with explanations for water usage. After nearly a year of presenting the data and working with PAR to improve irrigation systems, the decision was made to reclassify two full-time PAR positions into full-time irrigation specialists in a new Irrigation Division within the Public Works Department. These two positions are responsible for inspecting, repairing, adjusting, maintaining and managing the irrigation systems for the City, with the exception of the PAR athletic fields. Their first task was to inventory the systems, controllers and spray heads, adjust spray angles and set clocks and replace batteries. The two irrigation specialists have already made significant improvements to the systems at Public Works, Municipal Court and City Hall and are currently working on improvements to operation and efficiency of the irrigation system at College Station Utilities.

Overall, the City did an excellent job in FY 2010 of conserving water. Compiling annual water usage

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data in thousands of gallons shows a 37% decrease in irrigation usage at Parks & Athletic Fields, and a 57% decrease in irrigation usage at City facilities.

The category “Other Areas” includes medians

and islands, where the City of College Station is still establishing many trees and right-of-way landscaping that did not exist in FY 2009, so usage in this category is well above the previous year.

Category	Used in FY-09	Used in FY-10
Parks & Fields	94,058	59,169
City Facilities	17,608	7,580
Other Areas	4,408	9,741

Large Utility Indirect Program: City of Austin 3C Challenge Campaign

Austin Water provides safe, reliable drinking water to more than 900,000 residential and commercial customers. Austin Water draws from the Colorado River then supplies two water treatment plants that can process 285 million gallons per day.

In early 2010, the Austin City Council passed a resolution setting a goal to lower the total per capita potable water use to 140 gallons per capita per day by 2020. Currently the per capita use for Austin is about 167 gallons. This directive from council combined with the severe drought of 2008/2009 was a wake-up call that Austin still needed to do more to conserve water. To meet this new challenge, Austin Water began a new campaign to encourage water customers to be more aware of how they use water every day.

Our reasoning for launching the 3C Challenge awareness campaign was to begin a culture change for our customers to one that is more conservation-minded. The 3C Challenge encourages residents to commit to a water-wise lifestyle, calculate daily water use and conserve water now and in the future.

While Austin Water customers have significantly reduced personal water consumption over the past five years, more is needed to get our customers to the city council’s goal. Our goal for the campaign is to fine tune our resident’s water conservation habits by building awareness about new tools and driving customers to our water conservation assistance and incentive programs.

The new, online water calculator on WaterwiseAustin.org is a key piece of the campaign.

The calculator gives residents an estimate of their daily water use and tips on how to conserve. When Austin Water customers complete the water calculator, they receive an individualized plan of action to save water and are asked to pledge to a waterwise lifestyle. This plan of action directs the customer to the appropriate Austin Water programs (such as the free toilet program or rainwater harvesting rebate) designed to help them achieve greater water savings. The code for the online water calculator was supplied by Tampa Water and customized for the City of Austin. The calculator, which is in English and Spanish, is a permanent feature of Austin Water’s conservation website: WaterwiseAustin.org. Additionally, we promoted new water-use graphics on the City of Austin utility statement to our customers. These graphs give customers a view of their water use for the past 13 months, allowing them to track how well they are doing in their conservation efforts.

Austin Mayor Lee Leffingwell served as Austin Water’s spokesperson at the kickoff news conference in July 2010. To garner additional campaign participants, a contest was developed. Customers who used the online water calculator and took the waterwise pledge by the end of August were eligible to win a high efficiency washer/dryer.

The campaign reached across all media. Print included daily, weekly and monthly publications with strong placement in African –American and Spanish language newspapers. We produced several TV spots and ran radio ads that reached across

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Austin's diverse populations. We also had a heavy web presence on major news sites as well.

To support our community outreach, we produced collateral -- in English and Spanish -- that our outreach staff took to every event.

The 3C Challenge campaign, which will continue

into 2011, has already shown significant results. Below are some initial findings.

Year	Total Per Capita Water Demand
2007/2008	170 gallons
2008/2009	167 gallons
2009/2010	135 gallons

Small Utility Indirect Program: Wells Branch MUD Water Conservation for School Children Initiative

The Water Conservation for School Children Initiative is a conservation education project for public school elementary students and their parents in the Wells Branch Municipal Utility District. The project has three components:

- A copy of the book "Buckley T. Fuller and the Bucket Brigade," given to each second and fourth-grade student in the district to keep and take home. The book's theme is "Working together, we can save water and protect our environment." The book includes a variety of simple ways that children and their parents can conserve water in the home.
- A five lesson curriculum for teachers instructing the children on the principles of water conservation.

A class project was designed to reinforce the theme of the book. Students fill "Buckley's Bucket" by saving water at home. Each student takes a form home each day that a parent signs to verify the student saved water at home. When the form is returned, the student is given a water drop sticker to place on the bulletin board bucket. By including the parents in the project, the conservation message is extended to the adults as well as the children.

For all water utilities in Texas, the challenge is to encourage water efficiency. The Board of Directors of Wells Branch Municipal Utility District has set a goal: Reduce peak-time consumption of potable water.

Working in concert with its wholesale water supplier, the City of Austin, Wells Branch Municipal Utility District combined aggressive rainwater harvesting and a consistent public information campaign to encourage conservation by residential and consumer users.

Wells Branch MUD provides water to more than 2,700 customers. The district, created in 1981, is primarily single-family residential, but it also has a large constituency of apartment complexes. One strategy to spread the message of saving water was an outreach to the two elementary schools located in the district. By raising children's awareness, Wells Branch was confident that it could raise the level of awareness at the children's homes. This was particularly important because one of the elementary schools serves much of the apartment community, and the outreach allowed the district to penetrate that traditionally uninvolved demographic with its conservation message.

The MUD partnered with Davery Creatives of Austin to build a curriculum around the popular "Buckley T. Fuller and the Bucket Brigade" book that Davery had published. The MUD determined it would distribute a copy of the book to each second- and fourth-grader in the district over a two-year period at a cost of about \$6,000 per year. This insures by the end of the second year, each student in the elementary grades 2-5 within the district has had an opportunity to touch the message: Working together, we can save water and protect our environment.

Each book was labeled as a gift from Wells Branch Municipal Utility District, to underscore the importance of conservation to the utility. For teachers, Davery developed an educational curriculum that included lesson plans, bulletin board materials and a class project that students could work on at home, with the help of parents.

As it begins its second year of the initiative, Wells Branch MUD is in the process of surveying teachers, and early results are encouraging. From this feedback, the MUD has shifted its introduction

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of materials to the schools to earlier in the school year, allowing teachers more time and flexibility to integrate the water saving curriculum. The delivery of materials to the schools is one component, along with infrastructure additions and other strategies of the water conservation initiative of Wells Branch

MUD. Since beginning its effort, the MUD has reduced its peak monthly water usage from a high of almost 80 million gallons a month to about 46 million, even during dry years. This reduction came in spite of the addition of two large apartment complexes to its system.

Bob Derrington Water Reclamation Award:
City of Round Rock
Williamson County Water Reclamation & Reuse Project – Phases 1A & 1B

The City of Round Rock (CORR) is developing a new water reuse system that will produce high quality reuse water meeting Texas Commission on Environmental Quality (TCEQ) Type I quality criteria for unrestricted reuse. It will be used for landscape irrigation to help offset growing demands on the CORR's potable water supplies. The reuse water for the new system will be produced at the Brushy Creek Regional Wastewater Treatment Plant (BCRWWTP), pumped into an existing 24 inch reuse waterline installed adjacent to the BCRWWTP along US 79, and supplied for landscape irrigation through a network of new pipelines that will serve reuse customers north and west of the BCRWWTP. As currently planned, the reuse system will be constructed in five phases as follows.

1. Phase 1 consists of two phases.

A. Phase 1A includes approximately 9,000 linear feet (LF) of 24- and 12- inch transmission lines installed in a 570 acre CORR owned park called Old Settlers Park (OSP) that will convey reuse water for irrigation of numerous amenities in the park, including several soccer, softball and baseball fields. The pipeline will also provide reuse water to Dell Diamond, which is home of the Triple-A Round Rock Express baseball team.

B. Phase 1B includes construction of filtration, disinfection, storage and pumping facilities at the BCRWWTP for production and delivery of Type I reuse water to the distribution system. The Phase 1B facilities will have a capacity of approximately 6 million gallons per day (MGD).

2. Phase 2 will consist of installation of approximately 9,400 LF of 24 inch reuse water pipeline from OSP northward to future development areas adjacent to CR 112, and a 3 MGD expansion

of the treatment and pumping facilities at the BCRWWTP.

3. Phase 3 will include installation of about 4,700 LF of 24 inch and 16 inch reuse water lines westward along CR 112 to the new Round Rock Higher Education Campus (HEC).

4. Phase 4 will involve installation of approximately 900 LF of 16 inch reuse water line through the HEC, construction of a 1.25 million gallon (MG) elevated storage tank (EST) nearby, and a 3 MGD expansion of the treatment and pumping facilities at the BCRWWTP.

5. Phase 5 will entail installation of about 4,300 LF of 8 inch reuse water line from the existing 24 inch pipeline along US 79 westward to Stony Point High School.

Phase 1 of the reuse system is currently under construction with a scheduled completion date of February 2012, which will enable landscape irrigation with reuse water in OSP by the spring 2012 growing season. The overall goal of the CORR's reuse program is to provide reuse water throughout the City, in areas economically practical, and make the most of this often overlooked resource.

The CORR is in a relatively fast growing area of central Texas and that growth requires ongoing water supply planning to insure that water supply, water production, and water distribution facilities are maintained, improved, and expanded to meet current and future water needs. Current average water demand in the City is approximately 22,000 acre-feet per year (acre-feet/year) or 20 MGD. By 2050, the average demand is projected to increase to approximately 58,000 acre-feet/year or 52 MGD, which will result in a water supply deficit of about 7,000 acre-feet/year or 6.3 MGD based on the City's

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existing and planned potable water supplies. An engineering Feasibility Report (FR) was conducted in 2009 to determine the need, potential benefits, and strategies for implementing water reuse in Round Rock. The FR evaluated the need for reuse by analyzing both current and projected water supplies and demands for Round Rock, as well as current and projected wastewater treatment and disposal options for the City. In short, the FR predicted future water supply shortages in the Round Rock area and identified reuse as a viable component of the long range water supply for the City. The findings of the FR supported past studies related to reuse in Round Rock, including Texas Water Development Board (TWDB) regional water supply planning, water distribution system and reuse master plans conducted by the City, and a technical memorandum regarding treatment options that would allow production of Type I reuse water at the BCRWWTP. The FR also identified opportunities for water reuse in Round Rock, described and quantified alternatives to reuse, such as conservation and further development of potable water supplies, evaluated legal and institutional requirements related to reuse, determined technologies available for production of reuse water, and the estimated costs of reuse implementation in the CORR.

The reuse project is being funded by the City and by Federal grant funds administered by the Bureau of Reclamation (Reclamation). Because Federal funds are being used for the project, an environmental assessment (EA) was conducted in 2009 by the City, pursuant to the National Environmental Policy Act of 1969, as amended. The National Environmental Policy Act requires federal agencies to integrate environmental considerations into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. The EA studied the potential environmental impacts of the water reuse system on the project area. Based on the results of the EA, Reclamation determined that the proposed reuse project would not significantly affect the quality of the human environment.

Concurrent with the EA, a Water Reuse Master Plan Update was performed by the CORR to estimate irrigation demand in the proposed reuse system and develop a preliminary design for the Phase 1 reuse facilities. Reuse demands were calculated by

determining representative irrigation application rates and net area factors (percentage of irrigatable acreage) for potential reuse customers in the project area.

Estimated reuse demands were corroborated by potable water consumption data from existing irrigation meters in parts of the project area. The demand data were used to develop preliminary sizing for the reuse treatment and distribution facilities required for the proposed system. Estimated reuse system construction costs were also calculated from the preliminary design information.

Upon completion of the EA and Master Plan Update, simultaneous full scale design of Phases 1A and 1B was initiated. In order to maximize the benefits of the Federal grant funds allocated to the overall project, the Phase 1A pipeline was bid for construction in March 2010 and the project is nearing completion. Under a separate contract, construction is recently underway for the Phase 1B project and completion is scheduled for February 2012.

Phase 1 of the new water reuse system will reduce potable water demand in the City of Round Rock by approximately 6,800 acre-feet/year or 6 MGD when landscape irrigation is practiced during spring, summer and fall months. The projected ultimate demand of the reuse system is approximately 13,400 acre-feet/year or 12 MGD, which will result in further water savings. The estimated cost of the proposed CORR reuse system is \$328/acre-foot/year. The estimated costs include debt service, operation and maintenance, and reserves for equipment replacement and major maintenance items. Based on cost information generated by the FR, reuse is approximately \$52 per acre-foot per year less expensive than implementation of water conservation measures and \$404/acre-foot/year less costly than development of a new potable water supply from Lake Travis.

Additionally, construction bids for the Phase 1 projects were under budget, thus providing tangible evidence of cost savings associated with new reuse system. Implementation of reuse in Round Rock will help alleviate a projected future water supply deficit and allow deferral of more expensive water management options, which is consistent with the overall objective of the City's reuse program.