CITY PARK WATER RECLAMATION PROJECT

Texas City Efficiency Leadership Council Best Practice

Austin: City Park Water Reclamation Project

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Description of Project

Given the significant drought and water shortages Texas has experienced in the last several years, water efficiency and reclamation are increasingly popular topics. To ensure its water supplies, the city of Austin has been developing and implementing policies and projects to promote more efficient water use and reuse. In 2013, the city reclaimed 4 percent of its waste water, equivalent to 1.1 billion gallons of water.[1]

One of its more exciting water initiatives is the water reclamation project implemented at Krieg Field, the city's largest baseball complex, and two neighborhood sports fields. The three parks contain a total of 69 acres.

For several years, Austin's Parks Department considered options to irrigate these parks without potable water. One proposal was to put a well and pump on the shore of Lady Bird Lake to transfer lake water to the parks. While this option was being studied, the Austin Water Utility approached the Parks Department and asked them to instead consider using reclaimed water from the South Austin Regional Waste Water Treatment Plant. The utility offered to develop the reclaimed water piping infrastructure needed. The Parks Department agreed, and all three parks now are irrigated with reclaimed water.

Motivation for Implementing Water Reclamation Project

Austin faces significant water constraints due to geography and a rapidly growing population. According to the Texas Water Development Board, Austin will add more than 900,000 additional residents by 2030. This growth is expected to increase the city's water demand by 46 percent, leading to a likely water shortage of about 75,000 acre feet.[2] Based on this forecast, Austin is considering multiple options to reduce its consumption of potable water.

The city's water reclamation project also makes good economic sense for city operations. The city pays considerably less for reclaimed water, at $1 per 1,000 gallons (1 kgal) versus a potable water rate of up to $3.84 per kgal. The savings realized, along with the installation of higher-efficiency irrigation systems, have allowed the city to cover much of the cost of the reclamation project.

WHAT IS RECLAIMED WATER?

"Reclaimed" water is highly treated wastewater, similar in quality to untreated river water.

While it isn't drinkable without further treatment, reclaimed water can be used for irrigation, cooling towers, toilets and manufacturing.

All reclaimed water must be distributed and transported through purple PVC pipe that signals the water isn't potable

Project Benefits

The $883,710 water reclamation project saves 63,626 kgal of potable water annually. Savings also accrue from the implementation of a more efficient irrigation system at the parks, with high-efficiency sprinkler heads and irrigation controllers employing evaporative transpiration technology.

With these irrigation efficiencies and the lower rates paid for reclaimed water, the city realizes annual savings of $175,507, which have covered much of the cost of the project. The estimated payback for the reclamation portion of the project was five years on a system with a 30-year useful life.

An additional benefit is derived from lower energy costs for water treatment. Prior to the reclamation project, water for the parks was drawn from the Colorado River and treated at the water treatment plant. With the new reclamation project, less water is now drawn from the river for irrigation. The treated water leaves the wastewater treatment plant and goes directly to purple pipe for distribution to the parks.

[1] City of Austin, "Water Reclamation in Austin: Grow Green Landscape Professional Training," January 23, 2013, https://www.austintexas.gov/sites/default/files/files/Watershed/growgreen/training/2_Speaker-Two-1_23_13-Dan-Pedersen-Water-Reclamation-presentation.pdf.

[2] Texas Water Development Board, "More People, Less Water: What Will Texas Need to Keep Growing?" August 2013.

LEARN MORE ABOUT AUSTIN'S WATER RECLAMATION REQUIREMENTS

The city of Austin requires that any new commercial development within 250 feet of a reclaimed water main must connect to it for irrigation, cooling and other significant uses.

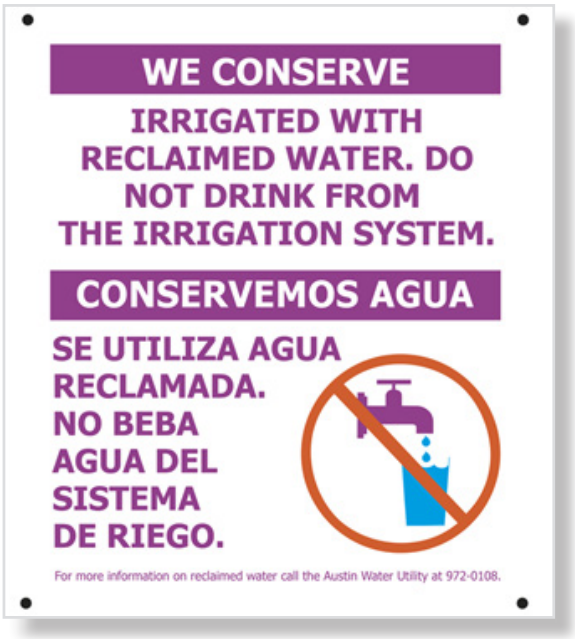
Resources:

- Application Form for variance or exception request
- Reclaimed Water System Testing

Challenges Addressed

When developing the Parks project there was a considerable amount of work required to make Code Enforcement comfortable with the project. Although reclaimed water use in public spaces is relatively common in Austin now, when the project began it faced questions about the safety of irrigating public places with reclaimed water. One such question concerned connection requirements, particularly the connections to existing potable-water piping in the parks. Because all of the park was previously on one meter they knew from the beginning that there were existing cross-connections that would need to be resolved. Ultimately the project team decided it was safest to run new potable-water lines to facilities on each site, and to use purple pipe for all reclaimed irrigation plumbing and sprinkler heads along with the proper check valves and back flow preventers, with proper signage.

Another challenge, typical of many large-scale public projects, was to identify funding for the project. The Parks Department had been considering the switch to reclaimed water for irrigation purposes but lacked the funding needed. Austin Energy has considerable expertise with large-scale projects using energy performance contracting financing. The utility worked with the Parks Department throughout the project development process, helping it to select the energy service company, Chevron Energy Services, and to secure funding.



Description of Retrofit Process

The Development of the overall energy and water conservation project began in 2006. The project focused on ensuring that all participating facilities would have water conservation measures, including water-efficient showerheads, toilets, urinals and water faucets, when the larger project was completed. Chevron Energy Solutions (CES) conducted an initial audit for the Parks Department to determine what energy and water systems would need modification. CES was one of three energy savings performance contractors (ESPCs) selected through an RFP process begun in 2005. The RFP process resulted in a contract through which the three ESPCs would be assigned to individual projects on a rotating basis.

During project development, it was decided the project would be a good opportunity to introduce reclaimed water for irrigation at three of the city's recreation fields. As noted above, the Parks Department had been considering using water from Lady Bird Lake to irrigate the fields. The Austin Water Utility, however, suggested that the Parks Department might want to tap into a new reclaimed water main it was building. The Parks Department determined this to be a better, lower-cost option than building a pumping and storage infrastructure on Lady Bird Lake and agreed to the reclaimed water option.

With the assistance of Austin Energy and CES, the reclaimed water portion of the project was included in the package of energy and water conservation measures, including retrofits at several park facilities, irrigation upgrades and the installation of the reclaimed water infrastructure at three parks. The initial cost of the total project was estimated at about $2.5 million, with $1 million for the reclaimed water portion. Not having funding readily available to undertake such a project, the Parks Department obtained a State of Texas LoanSTAR (Saving Taxes and Resources) loan to fund the project.

As the water reclamation phase of the project began, the Parks Department coordinated with the Austin Water Utility on the interconnection of the parks' reclaimed water system to the reclaimed water main. Before the interconnection was made, vendors working under the performance contract converted the parks to purple pipe. During this time, the city signed a memorandum of understanding with the utility agreeing to connect to the reclaimed water main line and to pay a reclaimed water rate of $1 per kgal.

Prior to installation, the Parks Department was working with the Austin Code Department. The reclaimed water project was the first of its kind in the city, and required a considerable amount of coordination and communication with the Code Department to ensure that the project was in compliance and the Code Department would permit the project when complete. The Code Department required backflow preventers, purple piping, purple sprinkler heads and signage notifying the public that reclaimed water was being used at the site. With the Code Department comfortable with the reclaimed water project, the Parks Department began installing the new reclaimed water irrigation system. The project was completed in 24 months.

Conclusion

The Parks Department's decision to use reclaimed water at its largest ball complex and two other facilities demonstrated a high level of innovation and vision. The project required significant coordination with the utilities, the Code Department and park users. The project has significantly reduced the three parks' potable water usage and lowered the city's electricity consumption, It also helped to make the use of reclaimed water an accepted practice that will be more widely used across the city by both the public and private sectors. This project demonstrates that City's taking the first step and leading by example can be the stimulus to move the rest of the community on to more sustainable and efficient operations.

AUSTIN'S RECLAMATION WATER SYSTEM MAP