

Appendix G

Town of Cary Case Study from USEPA

Guidelines for Water Reuse, September 2012

Town of Cary, North Carolina, Reclaimed Water System

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Project Background

The town of Cary, N.C., conducted a reclaimed water feasibility study in 1997 to evaluate how best to meet its goals of reducing per capita water consumption by 20 percent by 2015, to preserve the town's allocation of raw water from its drinking water source, Jordan Lake. In June 2001, Cary became the first municipality in North Carolina to pump reclaimed water to homes and businesses for irrigation and cooling.

Capacity and Type of Reuse Application

The town of Cary treats wastewater for Cary, Morrisville, the Raleigh-Durham International Airport, and the Wake County portion of the Research Triangle Park at its two water reclamation facilities (WRFs). Both the North Cary WRF and South Cary WRF have reclaimed water systems consisting of piping systems as well as bulk reclaimed water distribution stations.

The town of Cary's reclaimed water system began with several hundred customers in targeted service areas identified through an analysis of high irrigation demands and proximity to the WRFs. The system provides reclaimed water for irrigation and cooling for commercial facilities, lawn irrigation for single and multi-family homes, and irrigation for schools and a recreational complex. The system also includes bulk reclaimed water distribution stations at the town's two WRFs for filling tanks for uses such as irrigation, road construction, dust control, sewer flushing, and street cleaning (**Figure 1**).

Cary's reclaimed water system has a production capacity of approximately 5 mgd (219 L/s). The system produces approximately 1 mgd on a peak day and up to 20 million gallons per month (76,000 m³) during the summer.

The North Cary WRF reclaimed water service area includes a 9 mgd (394 L/s) pump station and 1 million gallon (3,800 m³) storage tank at the North Cary WRF required to meet peak day peak hour demands. It also includes approximately 9 miles (14.5 km) of 4- to 20-in

(10- to 51-cm) transmission and distribution mains. The South Cary WRF reclaimed water service area includes a 1.2-mgd (52.5-L/s) pump station at the South Cary WRF and approximately 1.4 miles (2.3 km) of 8- to 12-in (20- to 30-cm) transmission and distribution mains. The reclaimed water pumps at the town's WRF are shown in **Figure 2**.



Figure 1
Bulk reclaimed water distribution station (Photo credit: David Heiser)



Figure 2
New reclaimed water pumps at the WRF (Photo credit: David Heiser)

Water Quality Standards and Treatment Technology

The town of Cary's reclaimed water system was designed to meet the state's mandatory treatment standards (**Table 1**). Both WRFs treat wastewater

using biological nutrient removal and regularly meet the state reclaimed water quality standards.

Table 1 Minimum state reclaimed water quality standards

Parameter	Daily Maximum	Maximum Monthly Average
BOD5	15 mg/L	10 mg/L
TSS	10 mg/L	5 mg/L
NH ₃	6 mg/L	4 mg/L
Fecal coliform	25 cfu/100mL	14 cfu/100mL
Turbidity	10 NTU	10 NTU

Project Funding

The total project cost for the reclaimed water system including both the North Cary and South Cary WRFs was \$11 million. The project was funded through the town's capital improvement budget.

Reclaimed water in the town of Cary currently costs \$3.60/1,000 gallons (\$0.93/m³), which is the same as the town's Tier 1 potable water use rates. Reclaimed water rates were set less than potable water while recovering a substantial part of the town's capital cost for implementing the system. Use of reclaimed water allows customers to avoid higher Tier 2, 3, and 4 water rates that apply to water use greater than 5,000 gallons (19 m³) per month. Reclaimed water customers are also exempt from the town's alternate day watering restrictions. The town does not charge customers for reclaimed water obtained at its bulk reclaimed water distribution stations.

Reclaimed Water Program Management

The town of Cary's reclaimed water program is managed by a Reclaimed Water Coordinator, who is responsible for development of policy recommendations and selection of program alternatives; evaluating program effectiveness; collecting data; working with homeowners, businesses, and other potential reclaimed water customers; coordinating programs to encourage the use of reclaimed water; and inspecting the reclaimed water system for potential problems such as cross connections.

During implementation of its initial reclaimed water program, Cary sponsored numerous public education efforts, including public information sessions and hearings, fact sheets, news releases, meetings with

homeowners groups and other potential customers, an education program for plumbers and contractors, and information on the town's website. The town requires bulk reclaimed water users to complete a 1-hour training session in order to obtain a permit to use the reclaimed water.

Expansion of the Reclaimed Water Program

The town of Cary is currently expanding its reclaimed water system into a third service area. The town of Cary, Wake County, and Durham County are jointly implementing the Jordan Lake Water Reclamation and Reuse project. This project will provide reclaimed water from Durham County's Triangle Wastewater Treatment Plant to customers in the Wake County portion of Research Triangle Park and to the town of Cary's Thomas Brooks Park, the site of the USA Baseball national training center. The service area also includes some currently undeveloped portions of northwestern Cary.

The project is being financed by a State and Tribal Assistance Grant (STAG) from the federal government (administered by the Environmental Protection Agency) as well as the town of Cary, Wake County, and Durham County. The portion of this project serving the Wake County portion of Research Triangle Park and some of western Cary began operating in early 2012 and the remainder will be completed in 2013.

The town has recently initiated a comprehensive master planning study to develop a roadmap for future expansion of the town's reclaimed water program.

References

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