

Water Conservation in Residential Turf Irrigation

City of Woodbury

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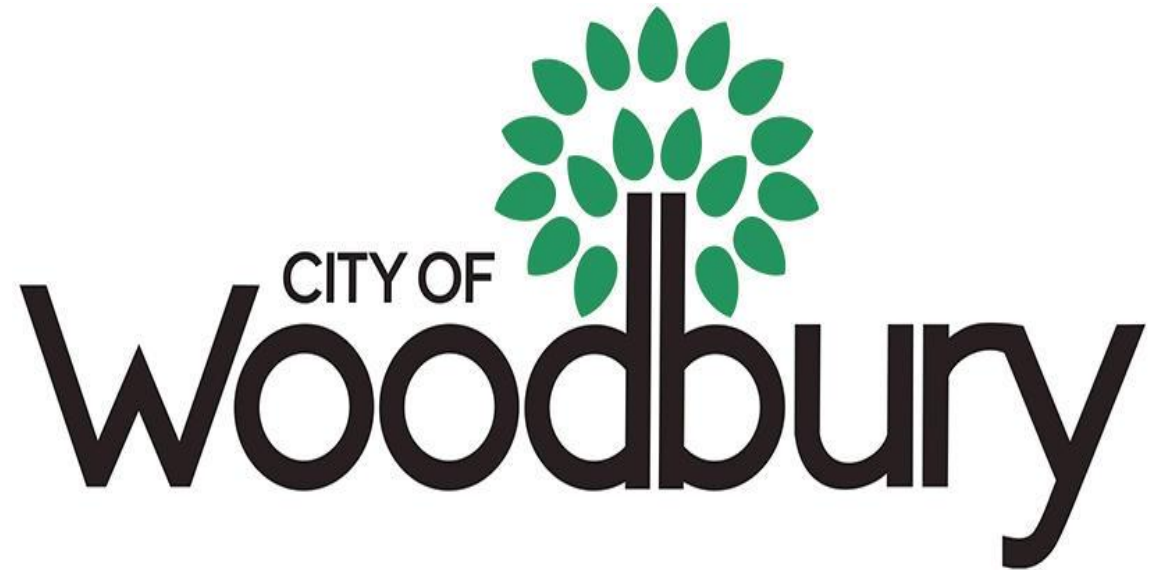


UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

City Overview

- Officially incorporated in 1967
- Population of 67,855 (2015)
- 9th largest City
- Approximately 25,517 housing units
- Draws water from the Prairie Du Chien-Jordan Aquifer



Incentives for Change

- **Flat Water-use by 2030**
 - Preserve the aquifer
 - Reduced need to drill more wells
 - Fostering a city-wide culture of water conservation



Reasons for MnTAP Assistance

- Improve residential water conservation through irrigation retrofits
- Developing a pilot program to distribute “smart” irrigation controllers to residential homeowners
- Evaluate the effectiveness of “smart” irrigation controllers
- Make recommendations for larger-scale distribution



“Smart” Irrigation Controller

- **Saves water in 2 ways**
 - Using lawn characteristics to optimize run-times/watering frequency
 - Skipping waterings with evapotranspiration and local weather data
- **Controlled remotely through smartphone app**
- **EPA WaterSense® Certified**
- **Smart Water Application Technologies® Tested**



Rachio Iro 2nd gen Smart Controller



Approach

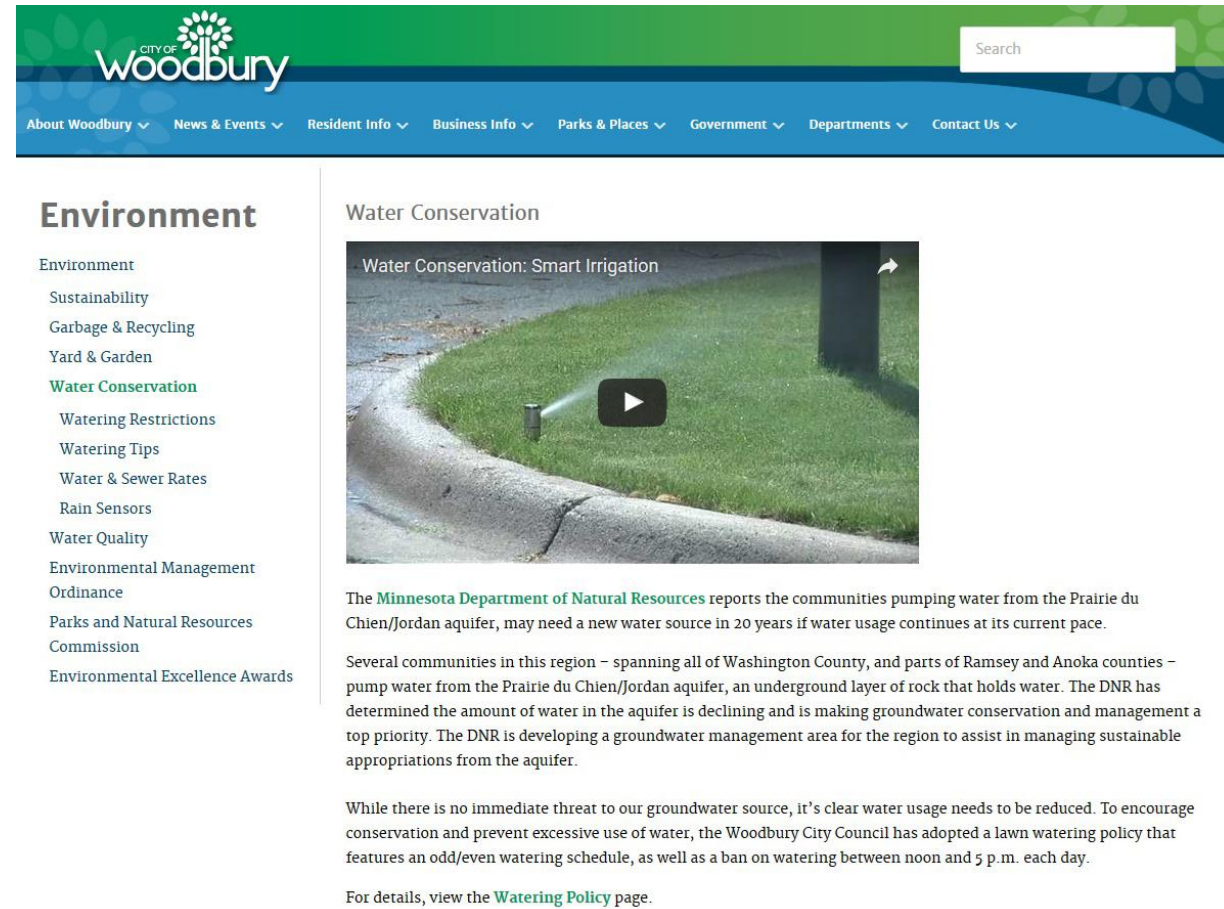
- City purchased 100 “smart” irrigation controllers
 - Provided at no cost to residents
- Developed an application/project agreement to obtain controller
- Worked with City staff to advertise the program
- Organized and facilitated distribution
- Verified installation of all 100 controllers
- Provided continuous technical support
 - Used to gauge complexity of installation/potential maintenance concerns
- Surveyed participants
- Conducted irrigation audits to estimate water savings

Program Application

- Describes the City's water conservation goals
- Gives background on the program
- Project agreement/criteria that needed to be met
- Information on existing irrigation system

Outreach

- Email and social media as communication tools
- Targeted to several groups
 - Eco-Interest Mailing List
 - Next Door Neighborhoods
- Posted on City website



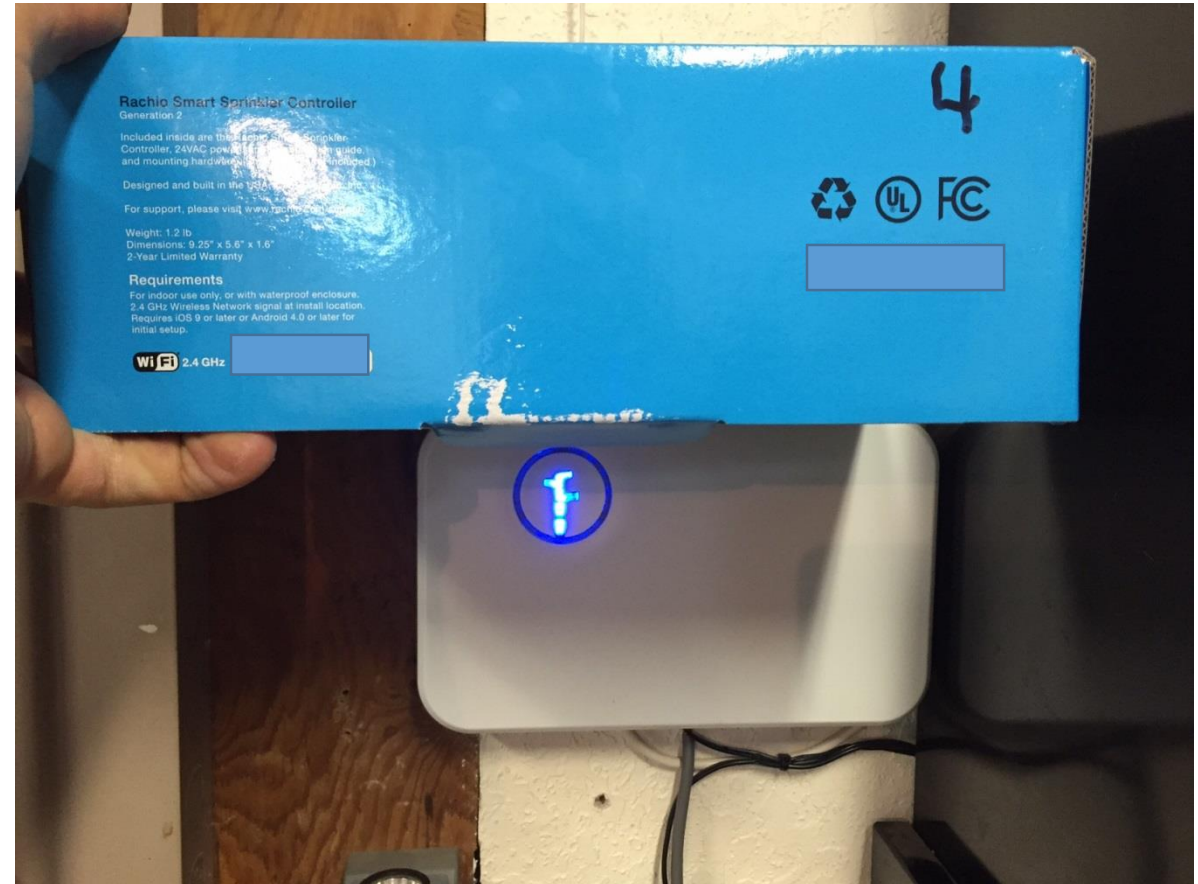
The screenshot shows the City of Woodbury website. The header includes the city logo and a search bar. The navigation menu lists: About Woodbury, News & Events, Resident Info, Business Info, Parks & Places, Government, Departments, and Contact Us. The main content area is titled "Environment" and lists several sub-topics: Environment, Sustainability, Garbage & Recycling, Yard & Garden, Water Conservation (highlighted in green), Watering Restrictions, Watering Tips, Water & Sewer Rates, Rain Sensors, Water Quality, Environmental Management Ordinance, Parks and Natural Resources Commission, and Environmental Excellence Awards. The "Water Conservation" section features a video titled "Water Conservation: Smart Irrigation" showing a lawn with a sprinkler. Below the video, text from the Minnesota Department of Natural Resources reports that communities pumping water from the Prairie du Chien/Jordan aquifer may need a new water source in 20 years if usage continues at its current pace. It also mentions that several communities in the region are addressing declining groundwater levels by developing management areas. A paragraph states that while there is no immediate threat to the groundwater source, water usage needs to be reduced, and the Woodbury City Council has adopted a lawn watering policy with an odd/even schedule and a ban on watering between noon and 5 p.m. each day. A link is provided to view the "Watering Policy" page.

Distribution

- **Controllers numbered 1-100**
- **Each number assigned to a participant**
- **Participant picked up controller at office, given further instructions**
- **Most picked up within 1 week of acceptance**

Verification

- Participants given 15 days to install controller
- Required to take a photo of their controller with box
 - Controller number and serial number visible
- Photo emailed to the City for archiving and tracking installation

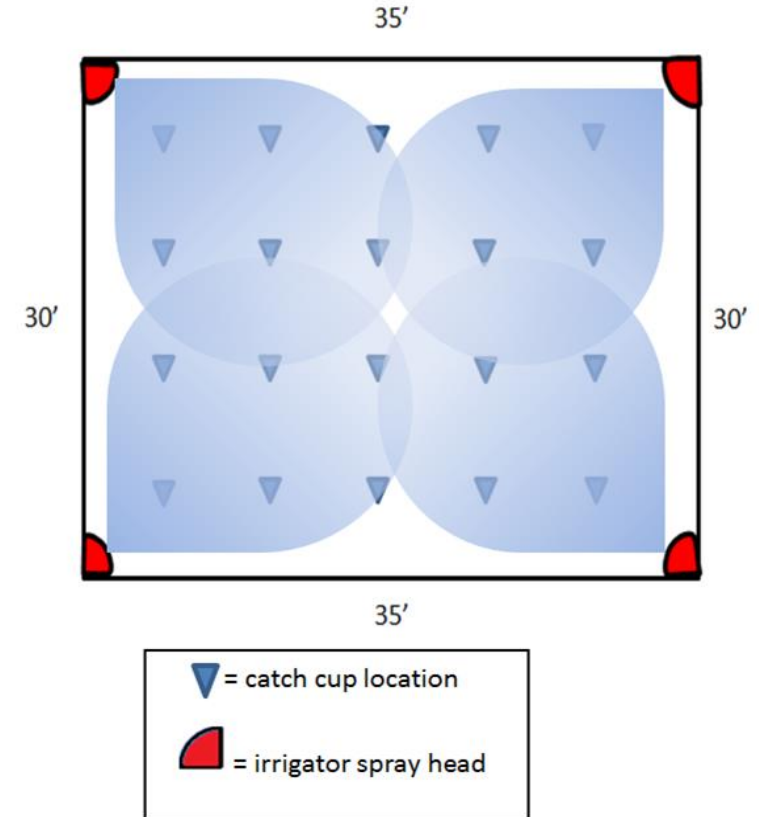


Surveying

- All 100 participants emailed a post-installation survey
- Satisfaction with controller/ program
- Comments/suggestions
- Scheduling tool for audits
- 60 responses (60% participation)

Irrigation Audits

- **5 Audits conducted**
 - Limited by weather (no rain, wind less than 5mph)
- **Catch cup test**
 - Distribution uniformity
 - Precipitation rate (used to calculate usage)
 - Zone by zone (usually between 6 and 8)



Audit Results

<u>Controller ID</u>	<u>Average Distribution Uniformity (DU)*</u>	<u>Estimated Annual Water Usage (gallons)**</u>	<u>Estimated Annual Water Savings (gallons)**</u>	<u>Percent Water Savings</u>
43	49%	53,231	30,230	56.79%
19	57.5%	76,265	48,970	64.21%
50	59%	59,154	20,840	35.23%
29	58%	95,725	44,780	46.78%
17	61%	88,421	40,550	45.86%
Average	56.9%	74,559	37,074	49.77%

**Between 50% and 60% DU is considered to be average performance*

***Based on a 5 month predicted irrigation season (May through September)*

Recommendation

- **Purchase and distribute as many “smart” irrigation controllers as desired to maximize impact**
 - Spread out purchases to maintain simplicity
 - Limit technical support
 - Continue surveying/evaluation to continuously improve program
 - Approximate savings using a five year rolling average in pumping reduction

Benefits Table

Initial Capital Investment (per unit)*	Annual Water Savings per unit (gal)**	Number of units purchased	Total cost	Total Water Savings (gal)***
\$150	~37,000	100	\$15,000	~3,000,000

****After bulk discount of \$50 per unit***

*****Based off of irrigation audit results***

*****Conservative estimate***

Personal Benefits

- Deepened understanding of City Infrastructure
- Communication on all levels from residents to city officials
- Time management and project management skills



Questions?

This project was sponsored in part by Metropolitan Council Environmental Services