

6.0 WATER DEMAND MANAGEMENT

As part of a long term strategy, this Plan addresses conservation efforts as a part of the overall water demand management in Goochland County. As required by the Regulation¹⁶⁷, current conservation practices and techniques are detailed in the following section of this Plan.

6.1 Practices for More Efficient Use of Water

The Virginia Uniform Statewide Building Code (USBC) is a state regulation promulgated by the Virginia Board of Housing and Community Development. The Board is appointed by the Governor of Virginia for the purpose of establishing minimum regulations to govern the construction and maintenance of buildings and structures.

The provisions of the USBC are based on nationally recognized building and fire codes published by the International Code Council, Inc. The 2003 editions of the International Codes are incorporated by reference into the USBC.

Goochland County has adopted the USBC. The county building inspector has the responsibility and authority to enforce the USBC. The USBC requires 1.6 gallon-per-flush toilets and limits the maximum allowable flow rates for showerheads and faucets to 1.5 gallons-per-minute. The county enforces these restrictions and does not have any more restrictive requirements.

Goochland County has also implemented measures to conserve water throughout the county by not allowing customers, other than those in the Tuckahoe Creek Service District, to irrigate lawns with public water. This is done in order to conserve and preserve the water that is allocated to Goochland County from Henrico County and the Department of Corrections.

6.2 Water Conservation Measures Used in the Planning Area

6.2.1 Technical Conservation Measures

There are several technical measures in Goochland County that promote water conservation. The county does not allow water lines smaller than 4” inches in

¹⁶⁷ 9 VAC 25-780-110.

diameter to be installed, with the exception of areas in cul-de-sacs with limited housing. This action was taken due to the high incidence of leaks in smaller lines. It is anticipated that this measure will reduce water loss and water line replacement costs.

The Goochland County Water Quality Roundtable has also made several recommendations that promote water management and sustainable growth. One recommendation that was included into the Comprehensive Plan is to reduce impervious cover and promote onsite infiltration of stormwater runoff in order to improve stormwater treatment and to enhance groundwater recharge. This could be achieved through implementation of the following measures:¹⁶⁸

- ◆ Reducing residential set back distances;
- ◆ Inclusion of porous concrete and permeable pavers as possible parking lot construction material;
- ◆ Recommending all parking areas to include 20% landscaping with native plants;
- ◆ Increasing shared parking;
- ◆ Reducing the minimum turnaround of a cul-de-sac to 70 feet in diameter; and
- ◆ Reducing the right-of-way for new streets.

Another method being practiced to conserve water is the use of rain barrels. Rain barrels are installed to make use of rain water and retained stormwater instead of extracting from groundwater or river sources. These rain collectors are used throughout the county to store water during rainy seasons for use during dry periods. The stored water has variable uses such as washing cars, watering gardens, irrigation for crops, flushing toilets, etc. Currently, the county Extension Agent is making an effort to promote the use of more rain barrels throughout the county.¹⁶⁹

¹⁶⁸ Goochland Water Quality Roundtable.

¹⁶⁹ Phone interview on December 19, 2007 with Goochland County Extension Agent.

6.2.2 Educational Conservation Measures

The county has made an effort of educating citizens about water conservation through school programs, public service groups, and conservation organizations, which provide a variety of educational programs.

The Soil and Water Conservation District (SWCD) is responsible for a wide range of educational efforts regarding the use and quality of water including:¹⁷⁰

- ◆ **Enviroscape** - This program was developed in an effort to educate children in elementary and middle school about the effects of non-point source pollution on soil and drinking water. During this presentation, the water budget is outlined and provides children with a better understanding of where their drinking water comes from and how to prevent pollution of water sources.
- ◆ **Camp Gooch** - This educational program is intended for children between the ages of 1 to 6 years. In this program, children learn about the “incredible journey of the water cycle” and the importance of water conservation.
- ◆ **Groundwater Model** – This model provides children with an understanding of the hydrologic cycle and groundwater movement. This educational model does not specifically target conservation efforts, but it does make children aware of water issues concerning over extraction from the groundwater supply.
- ◆ **Water Wizard Week** – This week-long event put on by the SWCD and other public service groups educates elementary children on the water cycle, water budget, and pollution affects. In this program, children rotate through several stations where each station teaches them a specific topic concerning water and healthy water practices.

The educational programs mentioned above are all efforts that lead to a better knowledge of water and the hydrological system. This better understanding of where water comes from can lead children to be more mindful of efforts to preserve and conserve existing water sources. All of these programs are available upon request by the school systems in Goochland County. With the success of these programs, it is anticipated that they will grow and be taught more frequently to schools around the county.

¹⁷⁰ Phone interview on December 17, 2007 with SWCD conservationist from the Monacan District.

The Master Gardeners Association, along with Goochland Extension Agents, are responsible for providing a wide range of educational efforts that promote water conservation including:¹⁷¹

- ◆ Green and Clean – This program educates homeowners on acceptable yard maintenance. The program encourages home owners to use xeriscaping, or water wise landscaping, by purchasing plants that are indigenous to the area and that are capable of withstanding extreme weather conditions. The Green and Clean program reaches out to approximately 50 homes a year, but is planning to contact more in the future.
- ◆ Spring Garden Festival – Much like the Green and Clean program, this annual event encourages citizens to use plants that require less irrigation. The Spring Garden Festival also teaches how to make plants more resistant to drought conditions by encouraging root growth through effective watering and fertilizing.

The non-profit Center for Rural Culture (CRC) organization contributes to the conservation effort by hosting educational water conservation forums. These forums work in conjunction with the Comprehensive Plan and the James River Association to promote water conservation and sustainable growth within Goochland County.¹⁷²

6.2.3 Financial Water Conservation Methods

The county’s water rates are not structured to encourage conservation. All users are charged based on a minimum consumption of 8,000 gallons per bi-monthly billing cycle. Any usage in excess of 8,000 gallons is billed at a uniform rate. The following table depicts the county’s current water charges.

Table 81: Water Billing Rates¹⁷³

| Service Area | Users | Billing Rates per 1,000 Gallons ¹⁷⁴ | Minimum Charge |
|---------------------------------|-----------------|--|----------------|
| General County | Residential | \$3.33 | \$26.64 |
| | Non-residential | \$4.66 | \$37.28 |
| Tuckahoe Creek Service District | Residential | \$3.56 | \$27.12 |
| | Non-residential | \$4.74 | \$37.92 |

¹⁷¹ Phone interview on December 17, 2007.

¹⁷² Phone Interview on December 19, 2007 with the Center for Rural Culture president.

¹⁷³ Goochland County Website – Water and Sewer Rates as of July 1, 2011.

¹⁷⁴ 2008 Billing Rates.

6.3 Practices that Address Water Loss

Goochland County has developed a proactive process to constantly compare water production records to the water usage records. After each bi-monthly billing cycle, the county compares the water production records to the amount of water billed in order to identify any increase in the amount of unaccounted water. This process has enabled the county to constantly monitor the loss percentages and to look for leaks when the loss percentage is outside of the normal range. A significant amount of the county's resources are devoted to water line replacement projects and leak correction. Further, the county has implemented an ongoing meter replacement program in order to more accurately measure the water consumed by the water customers.

The county is also doing more to stop unauthorized use of water. There have been instances in the past where people have taken water from hydrants without authorization. Goochland County is now making an effort to place a meter at hydrant locations so that the county can detect when individuals are collecting unauthorized water.

6.4 Potential Water Savings

According to the Local and Regional Water Supply Planning Regulation, current conservation practices, techniques, and technologies shall be considered when making demand projections. Current conservation efforts by the county are imbedded into the demand projections. However, with the implementation of more efficient water technologies, increasing regulations, and education programs, it can be assumed that the future gross gallons per capita per day will be reduced; hence reducing the overall demand. The following table depicts the potential water savings from a decrease in demand.

**Table 82: Potential Water Savings with a Decrease in Demand
(Community Water Systems and Self-Supplied Users)**

| Census Tract | Total 2060 GPD (Mid-Range Projection) | Demand Reduction (%) | Water Saving Per Day (MG) | Water Savings Per Year (MG) |
|--------------|---------------------------------------|----------------------|---------------------------|-----------------------------|
| 4001 | 5,969,406 | 1% | 0.06 | 21.79 |
| | | 5% | 0.30 | 108.94 |
| | | 10% | 0.60 | 217.88 |
| 4002 | 2,463,687 | 1% | 0.02 | 8.99 |
| | | 5% | 0.12 | 44.96 |
| | | 10% | 0.25 | 89.92 |
| 4003 | 826,212 | 1% | 0.01 | 3.02 |
| | | 5% | 0.04 | 15.08 |
| | | 10% | 0.08 | 30.16 |
| 4004 | 2,194,341 | 1% | 0.02 | 8.01 |
| | | 5% | 0.11 | 40.05 |
| | | 10% | 0.22 | 80.09 |
| 4005 | 1,474,089 | 1% | 0.01 | 5.38 |
| | | 5% | 0.07 | 26.90 |
| | | 10% | 0.15 | 53.80 |
| Total | 12,927,734 | 1% | 0.13 | 47.19 |
| | | 5% | 0.65 | 235.93 |
| | | 10% | 1.29 | 471.86 |

As shown in the table above, the future water demand of self-supplied users and the community water systems can be reduced by 235 million gallons per year or 0.65 million gallons per day with a countywide 5% reduction in water usage.