

**Goochland County Water Supply Plan
(A Portion of the Regional Water Supply Plan for
Goochland, Henrico, Cumberland and Powhatan Counties)**

Executive Summary

The Goochland County Water Supply Plan was developed in response to the State Water Control Board's Local and Regional Water Supply Planning Regulation which establishes a comprehensive water supply planning process for the development of local, regional and state water supply plans.

Goochland County joined Henrico, Powhatan and Cumberland Counties in the preparation of a regional water supply plan. The SWCB Regulation requires that each of the participating counties must review, adopt and submit the regional water supply plan by November 2, 2011.

The Regulation requires that certain information be reviewed, evaluated and presented in the Plan. The following describes the major sections of Goochland's portion of the Regional Plan and includes information regarding future sources of water for Goochland County and for the entire region.

1.0 EXISTING WATER SUPPLY AND EXISTING USAGE OF WATER

The following sources and uses of water are described in the Plan:

1.1 Community Systems

The Plan includes annual usage, average daily usage, number of connections and types of customers served for the following community water systems:

- ◆ Eastern Goochland Water System
- ◆ Goochland Courthouse
- ◆ James River Correctional Center
- ◆ Crozier
- ◆ Elk Hill Farm
- ◆ Jenkins Trailer Park
- ◆ Manakin Farms
- ◆ Meadows Nursing Center

1.2 Agricultural and Non-Agricultural Uses

The Plan includes estimates of water used for livestock and for crops. Additionally, there are six golf courses and three stone/gravel quarries in Goochland. The Plan includes a brief description of each and includes estimates of annual water usage of each.

1.3 Self-Supplied Homes, Businesses and Schools

The Plan includes an estimate of the number of homes in the county that have “private wells” and the daily and annual usage is estimated. Additionally, there are six non-community systems that serve churches, elementary schools and other non-residential uses; estimates of daily and annual usage are provided.

2.0 PROJECTED FUTURE WATER DEMANDS

The Regulation requires that the Plan include projections of water demands for the next 50 years. Using the future land-use plans and the historical and projected population of the County, future water demands were estimated. The demands were projected using two methods: population-based and land-use based.

2.1 Demands Based on Population Projections

The population based projections use current and historical population in Goochland and estimate future water demands. The future water demands for each Census Tract¹ were projected using three different growth rates; low-range, mid-range and high-range.

When projecting future demands, it is important to distinguish between the demands community water systems must meet. This enables the local government and the community systems to be better prepared to meet future needs.

The table on the following page presents an estimate of the amount of water that will be provided by community water systems over the next 50 years and also provides an estimate of the usage by self-supplied population.² It is anticipated that future water demands throughout Goochland County will become more centralized in the village centers and service districts. This is in keeping with the Goochland County Comprehensive Plan.

2.2 Demand Projections Based on Land Use

The land use demand projections use the future land use designations detailed in the Comprehensive Plan and estimate the future water demands based on build-out of each village. The calculations include the land area of each type of future land use and the estimated water demands based on type of land use.

The following table summarizes the demand projections based on full build-out. Comparison of the two methods of projecting future demands shows that the build-out demands will not be reached until well past 2060.

¹ A map showing the Census Tracts is found on page 116 of the Plan.

² Community system demand projections are based on the Future Demand Percentages from Table 76 and the mid-range community/self-supplied residential demand projections from Table 74.

Table 1. Average Daily Water Demand Projections (Mid-range Population and Land Use)³

Census Tract	Type of Water Use	Demand Projections (gpd)		
		2010	2060 ⁴	Build-Out ⁵
4001	Community System (Eastern Goochland)	705,000	4,261,576	15,760,000
	Other Community Systems (Manakin Farms)	70,190	417,858	
	Quarries and Golf Courses	2,329,307	2,329,307	
	Self-Supplied	373,200	1,289,971	
	Sub-Total	3,477,697	8,298,713	
4002	Community System (Crozier and Oilville) ⁶	8,544	1,059,385	1,790,000
	Golf Course	16,667	16,667	
	Self-Supplied	418,637	1,404,301	
	Sub-Total	443,285	2,480,354	
4003	Institutional (Goochland County)	190,739	190,739	300,000
	Institutional (Powhatan County)	559,260	559,260	600,000
	Self-Supplied	-	76,213	460,000
	Sub-Total	749,999	826,212	1,360,000
4004	Community System (Courthouse)	144,000	877,736	1,580,000
	Other Community Systems	12,772	20,846	150,000
	Self-Supplied	478,000	1,295,758	3,980,000
	Sub-Total	634,772	2,194,341	5,710,000
4005	Community Systems (Elk Hill)	5,480	13,267	7,200,000
	Golf Course	150,000	150,000	
	Self-Supplied	413,800	1,460,822	
	Sub-Total	569,280	1,624,089	
Total		5,875,596	15,423,708	35,410,000

3.0 DROUGHT RESPONSE AND CONTINGENCY PLAN

The SWCB Regulation requires that localities with community water systems that use more than 10,000 gallons per day must have a drought response and contingency plan.

Due to the contractual water agreement between Goochland County and Henrico County and the dependence on Henrico’s water supply, Goochland follows any drought declarations made by Henrico County.

4.0 STATEMENT OF NEED AND ALTERNATIVES ANALYSIS

4.1 Eastern Goochland

The existing contract with Henrico County will provide enough water to meet the projected demands in Eastern Goochland through 2060. In order for Henrico County to meet future demands, the Cobbs Creek Reservoir is identified as the long-term water source for Henrico County and, as a result, the long-term solution for Eastern Goochland.

³ Agricultural uses are not included.

⁴ Projection is based on mid-range population growth rates.

⁵ Projection is based on land use designations as presented in the 2028 Comprehensive Plan.

⁶ Assumes a potential community water system in the Oilville Village by 2020.

4.2 Courthouse Village and Correctional Center

The James River Correctional Center Treatment Plant is adequate to meet the projected demands of the Department of Corrections needs as well as the Courthouse Village for the next 50 years. However, the existing contract with the Department of Corrections allocates 300,000 gpd to Goochland.

4.3 Major Village Areas

It is anticipated that the other major village areas, Oilville and Manakin, will continue to rely on self-supplied groundwater sources until residential, commercial or industrial development increases to a point where a community water system is needed. A community water system could be supplied by groundwater, or, water could be provided by the Eastern Goochland water system.

4.4 Rural Villages

The rural villages: Hadensville, Sandy Hook, Fife-George's Tavern and Crozier will continue to rely on groundwater for the foreseeable future. It is possible that community or non-community systems that rely on groundwater will develop in these villages.

4.5 Regional Solution

The focus of the Alternatives Analysis for Goochland County is the planned Cobbs Creek Reservoir which is a regional project designed to meet the future water needs of Henrico, Cumberland, Powhatan and Goochland Counties.

The reservoir will be built, owned and operated by Henrico County. The 1,017 acre reservoir will be located in northwest Cumberland County. The raw water storage capacity is 14.8 billion gallons of water and the safe yield is estimated to be 47 million gallons per day which is projected to provide water to meet the regional needs through most, if not all, of the 50-year planning horizon.

Key project components include:

- ◆ James River withdrawal facilities
- ◆ A dam and reservoir
- ◆ Reservoir withdrawal facilities
- ◆ A transfer pipe between the river and the reservoir

Water from the James River will be pumped to the reservoir when river flows are adequate. Controlled releases from the reservoir will be made to the James River during droughts and other periods when the James River flows are inadequate to support regional demands.

Henrico County's share of the capacity of the reservoir is 30 million gallons and Goochland County will continue to purchase water from Henrico County in accordance with the existing contract.

4.6 Reuse

One way to extend the groundwater and surface water supply that will be needed to meet increasing demands for water is to use (or reuse) treated wastewater that has undergone a high level of treatment. Studies in other parts of the United States have shown that using reuse water can reduce the demand for potable water by 5 to 20 percent. Virginia has adopted Water Reuse Regulations that allow for the potential application of reuse water for a variety of potable and non-potable uses.

Currently, there are limited opportunities for developing reuse projects in Goochland County due to the limited number of wastewater treatment facilities in the county. It is recommended that the county be aware of the reuse regulations and consider opportunities to take advantage of this method of reducing water demands when available.

5.0 NEXT STEPS

The draft Water Supply Plan will be available to the public and Goochland County will hold a public hearing where the key components of the water supply plan can be presented to the public and to the Board of Supervisors.

Following the public hearing, and before November 2, 2011, the Board of Supervisors must adopt the Water Supply Plan and submit a copy to VDEQ for review.