



Greene County Water Supply and the White Run Reservoir Project

Introduction and Project Overview

Water availability affects every aspect of our daily life. It provides us with the necessary water to cook, drink and bathe, but that is only the beginning. A reliable and sustainable water supply is a critical aspect of the future of our quality of life in Greene. Our businesses that we depend upon for services need the water to operate, but also to supply the homes that are needed for their employees. All of us depend upon a reliable water supply to provide fire protection and safety. Water demand and the County's supply requirements are based upon the peak usage. In other words, the supply must provide enough capacity for the highest usage expected. Think of a hot, dry summer day when every store, business, pool, car wash, and home is at maximum capacity. Not only must our water source meet these current demands, it must be able to meet these demands in the future.

Economic growth in Greene is already stretching our capacity, and without a dependable water supply, new, quality business opportunities will be extremely limited. This has potential to cause a structural imbalance and a greater demand for services from the County, where residential growth outweighs commercial, agricultural and industrial growth, creating the need to provide additional services that are uniquely attributable to residential growth.

There are limited options for providing water supply. Groundwater (wells) and surface water (lakes and rivers) are the options available in Greene. In most of the soils in Greene the groundwater moves very slowly and limits the capacity of water that each well can supply. Groundwater wells are also frequently impacted by the natural minerals in the ground that can affect water quality and treatment costs.

Surface water withdrawal has been determined to be a more viable option for the County. Because this is typically limited by permit to prevent drawdown that lowers the water level beyond an acceptable level, a storage facility, or reservoir, is necessary to ensure the continuity of the water supply during periods of drought or other conditions that may affect the surface water source.

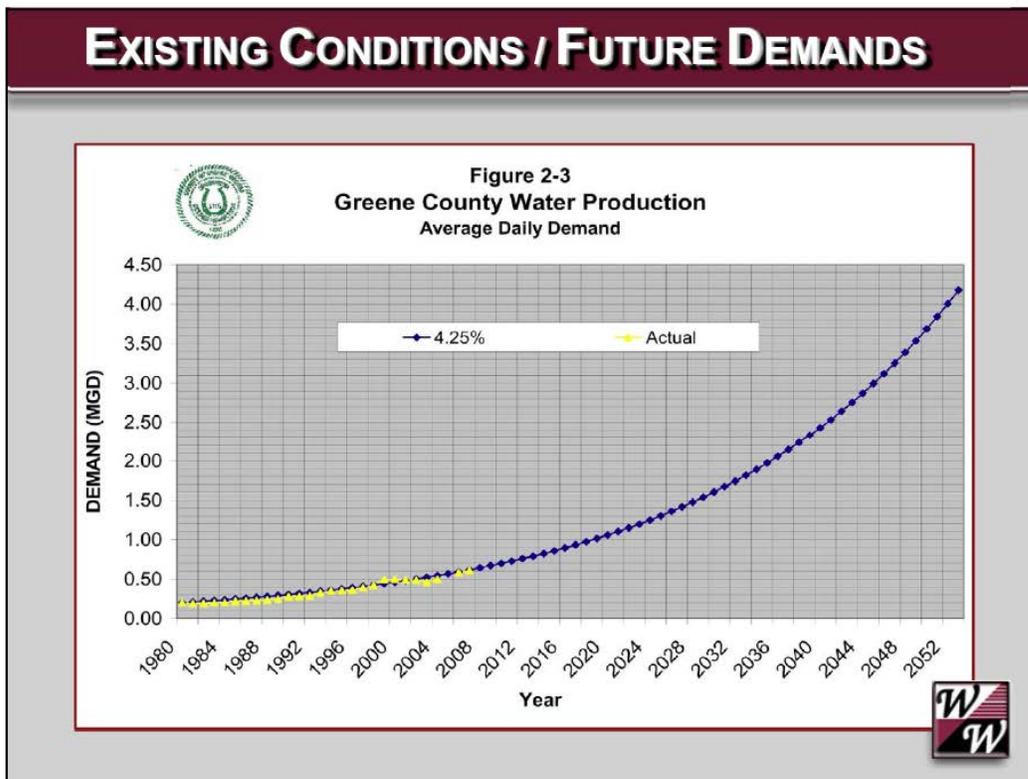
History of the Project

Greene began the exploration and planning for a dependable long term surface water supply in 2000. Water supply sources were evaluated based upon the volume and sustainability of water supplied. The report concluded that due to the limitations of other water supply sources, the construction of impoundments would be the only method of securing water for the future. This method withdraws water from the intake at the Rapidan River and pumps it to an impoundment lake or reservoir. The extra storage created by the impoundment/reservoir protects against drought and maintains water supply capacity even when the river water levels drop below the level allowed by permit. It also environmentally protects the river resource from periods of dry weather.

In 2005, after the Commonwealth of Virginia experienced a severe drought that placed many communities into emergency, mandatory water usage restrictions, all communities were required to develop a 50 year water supply plan.

<https://lis.virginia.gov/cgi-bin/legp604.exe?000+reg+9VAC25-780-50>.

The plan had to provide a proven, sustainable water supply that was based upon current demand and anticipated growth requirements. The plan had to provide the most cost effective, reliable water supply alternative in order to be approved. The planning process to determine water needs and supply alternatives began and the first draft was presented in 2008.



EXISTING CONDITIONS / FUTURE DEMANDS



■ Greene County Water Demand Projections

Year	Average Daily Flow (MGD)	Peak Monthly Flow (MGD)	Peak Daily Flow (MGD)
2009	0.7	0.8	1.2
2033	1.8	2.2	3.3
2048	3.4	4.1	6.0

- **New Water Treatment Plant –**
3.0 MGD to meet the peak daily demand in year 2030

- **Minimum Safe Yield**
3.5 MGD needed for 40 years



Greene County Board of Supervisors-Regional Water Supply Study – April 22, 2008, WW Associates (page 5)
Using the original 2000 water supply plan as a starting point, five sites were identified as the most practical. These included the top sites from the 2000 plan and two newly identified alternatives.

Table 2-1			
August 2000 Report – Potential Reservoir Sites			
<u>In-Stream Sites</u>	<u>County</u>	<u>Pumped Storage Sites</u>	<u>County</u>
South River	Greene	Rapidan River – Trib 1	Greene
Swift Run	Greene	Rapidan River – Trib 2	Madison
Roach River	Greene	Buckner Run	Madison
Elk Run	Madison	White Run Tributary	Madison
Mountain Run	Orange	Rippin Run	Greene
		Church Run	Greene
		Marsh Run	Greene
		Calvin Run	Orange
		Beaver Run	Orange/Greene
		Welsh Run	Orange/Greene
		Preddy Creek	Orange
<u>Pumped Storage Sites</u>	<u>County</u>		
Robinson River Tributary	Madison		
Beaver Run	Madison		
White Oak Run – Trib 1	Madison		
White Oak Run – Trib 2	Madison		

Joint Permit Application – Pumped Storage Reservoir Greene Co. - WW Associates- Vol. 1 (page 9)

In 2008, the County conducted a water supply study that, among other recommendations, identified the Upper Welsh Run (listed above) site as the top site for water storage. The County then began the site evaluation process and testing required by the US Army Corp of Engineers.

The soil structure and quality was determined to be insufficient to provide effective water storage after the required testing. At that time the focus and site evaluation moved on to the White Run site alternative. Greene was able to gain approval from the US Army Corp of Engineers for the White Run site through the joint permit application process. Greene also successfully petitioned and received approval to avoid the cost of conducting additional engineering studies on the lower rated alternatives resulting in significant savings.

RESERVOIR SELECTION MATRIX

Evaluation Category	Weighting Factor	White Run		Upper Welsh Run		Buckner Run		Blackberry Lane		Henshaw Run	
		Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score
Environmental Impact	10	8	80	8	80	5	50	8	80	7	70
Volume/Yield	10	7	70	10	100	10	100	7	70	10	100
Land Acquisition	9	4	36	8	72	8	72	6	54	6	54
Total Construction Cost	9	7	63	6	54	6	54	5	45	5	45
Land Owner Impact	8	9	72	9	72	5	40	5	40	5	40
Infrastructure Impact	7	8	56	7	49	8	56	5	35	5	35
Distance to Diversion	5	8	40	7	35	8	40	8	40	7	35
Service Area Proximity	5	8	40	9	45	8	40	8	40	7	35
Total	63		457		507		452		404		414
Weighted Average	630	0.73		0.80		0.71		0.66		0.66	



Greene County Board of Supervisors-Regional Water Supply Study – April 22, 2008, WW Associates (page 13)

After gaining approval, the Regional Water Supply Plan was submitted for final approval and permitting, in the form of the 2011 Joint Permit Application for a Pumped Water Reservoir.

<http://www.greencountyva.gov/how-to/forms/admin/white-run-reservoir/965-joint-permit-application-pumped-storage-reservoir-greene-co-ww-associates-vol-i/file>

In 2012, the process then moved on to the required site studies and preliminary engineering. This involved completing environmental, historical, property owner, downstream user and infrastructure impact studies, along with the construction cost estimate. After completing and receiving approval for the preliminary engineering, Greene County began the process of negotiating with the property owners and acquiring the property needed to build the impoundment, with roughly 90% of the property acquisitions now completed.

Current Status of the Project and Next Steps

Currently, the County is moving forward with the site specific design and engineering. This requires the design of the Rapidan River intake, raw water pipe to the reservoir, water treatment

plant and the earthen dam. The County is also exploring and negotiating the costs to provide the Stream and Wetland credits required by Federal and State law.

Section 4 – Compensatory Mitigation

4.1 Stream and Wetland Mitigation

The preferred White Run Reservoir site will result in permanent unavoidable impacts to 2.2 acres of wetlands, 15,891 linear ft. of streams(reservoir), 230 ft. of streams(Rapidan River) and 2.15 acres of open water. To mitigate for these losses, onsite and offsite mitigation options were explored. Provided below is a discussion of the options explored.

Federal Regulations governing compensatory mitigation were revised by the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule, 2008 (DoD 33 CFR 325 and 332, EPA 40 CFR 230). Based on the compensation hierarchy defined in the Final Rule, the preference for mitigation is the purchase of bank credits, the purchase of in-lieu fee credits, permittee-responsible mitigation under a watershed approach, onsite in-kind mitigation creation, and offsite out-of-kind mitigation creation.

Joint Permit Application – Pumped Storage Reservoir Greene Co - WW Associates- Vol. 1 (pages 26-27)

The cost of these required credits adds significant cost to the overall project. Projected mitigation costs range from \$8-10 million dollars.

The cost and scale of the project will require additional funding from fees paid by the users of the system and be supported by County tax dollars. It is important to note that the current user rates are very low and unsustainable, having seen only two modest rate increases in the past fifteen years. In times of higher growth the connection fees charged to the new users subsidized the existing users and allowed the water rates to stay artificially low. With the recent years of modest growth, the user fees and new connection fees do not generate enough revenue to cover the operating and infrastructure costs of managing the existing system. In 2015 Greene County added a \$10 per month infrastructure fee to residential accounts and a \$20 per month fee for non-residential accounts. Even after the implementation of the infrastructure fee, the system remains unsustainable in its current structure and is supplemented by tax payers with general fund tax dollars.

Finally, the County is reviewing options for the financing and implementation schedule to determine how best to complete the project in the most efficient and effective way. Once those options, alternatives, impacts and costs are identified they will be presented to the public for input and comment.

Securing the future water supply and economic viability of Greene County is vital, but comes with a significant price tag. Total project estimates range from \$45-65 million dollars. Information regarding new developments and public meetings will be updated as it becomes available at <http://www.greenecountyva.gov/government/depts/administration/white-run-reservoir-water-impoundment-project>. Contact the County Administrator' Office at (434) 985-5201 with any comments or questions.