WASHINGTON COUNTY SERVICE AUTHORITY

IN THE PIPE

NEWSLETTER

Summer/Fall 2014 No. 7

Applying the Proper Treatment: WCSA's Methods for Cleaning Wastewater

This is the third in a three-part series of articles about WCSA's water and wastewater treatment processes.

Hall Creek Wastewater Treatment Plant

The Hall Creek Wastewater Treatment Plant (formerly called Emory-Meadowview) is located adjacent to Highlands Business Park and Hall Creek near Glade Spring.

Screening and influent pump station at Hall Creek

The plant began operating in 1996 and provides sanitary sewer service to the Washington County communities of Emory, Meadowview and Glade Spring, as well as the Washington County Industrial Park (Exit 22), Highlands Business Park and Emory & Henry College. The plant's collection system consists of gravity and force main lines, along with 11 pump stations.

Oxidation ditch at Hall Creek

The plant is authorized to discharge under the Virginia Pollution Discharge Elimination System (VPDES) and the Virginia State Water Control Board. It is permitted by the Virginia Department of Environmental Quality to discharge to Hall Creek, which is part of the Middle Fork Holston River watershed. Originally designed to treat an average flow of 315,000 gallons per day (gpd), the plant was upgraded in 2000 and can now treat 630,000 gpd.

Wastewater enters the plant through a single 12-inch pipe. It travels through a channel equipped with a mechanical screen that filters out large items. Wastewater then travels through an open channel grinder pump to reduce the size of the material that passed through the mechanical screen. Wastewater is then pumped into a manhole, where it travels by gravity through a grit removal channel to remove additional debris from the waste stream. If needed, the wastewater can bypass the grit removal channel.

The wastewater then travels to the

Secondary clarifier at Hall Creek

oxidation ditch, which serves as the primary treatment for the wastewater and consists of three oval basins with a total capacity of approximately 526,000 gallons. Wastewater flows into the three basins, where air is added to provide oxygen, mixing and movement within the basins,

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WCSA Project Updates

To learn more about WCSA projects, visit www.wcsawater.com, highlight "Capital Projects" and select "Project Current Status" on the menu bar at the left of the page. This will direct you to our Capital Improvement Projects Report, which includes a comprehensive overview of WCSA's water and wastewater projects.

Recently Completed Projects:

Construction was completed in June on the **Nordyke Road Water Project**. This project replaced an older, 2-inch water line along Nordyke Road, located between Benhams Road and Rich Valley Road, with a new water line. Residents of the community have started connecting to the new water system.

Ongoing Projects:

The **Sutherland Community Water Project** will serve the Sutherland community in the Shady Valley area, located at the Washington County, Virginia/Johnson County, Tennessee, line, and the recreation area at Backbone Rock. Funding is provided by the Tennessee Department of Economic and Community Development, the U.S. Environmental Protection Agency and the U.S. Forest Service. Service is expected to be available in August.

Construction at the Rich Valley Road/Whites Mill Road Water Project

The **Tumbling Creek South Water Project** and **North Fork River Road at Tumbling Creek South Water Project** will extend water service along the remaining southern portion of Tumbling Creek Road, and also approximately 1,400 feet along North Fork River Road from its intersection with Tumbling Creek Road. Construction is expected to be completed in August.

The **Rich Valley Road/Whites Mill Road Water Project** will extend water service along Rich Valley Road from Greendale Elementary School to the intersection of Whites Mill Road, and along Whites Mill Road toward the town of Abingdon. Construction is expected to be completed by early December.

The **Galvanized Water Line Replacement – Phase Two Project** is the second step in a three-phase project to replace all galvanized pipe in WCSA's distribution system over the next several years. Phase One is complete, and WCSA opened bids for Phase Two in June. Construction is expected to begin in late August/early September and continue over the next year.

The **Hidden Valley Phase One Water System Extension Project** will extend water service along Porterfield Highway to the Hidden Valley Road intersection, and northward along Hidden Valley Road to an approximate elevation of 2,500 feet (near Chestnut Grove Community Church). A follow-up extension project will provide water service beyond this location and require a booster pump station and water storage tank. Water for this service area will be provided by the Russell County Public Service Authority. WCSA plans to advertise Phase One in August 2014. Construction is expected to begin in late 2014.

Recent construction of the Sutherland Community Water Project

WCSA's Methods for Cleaning Wastewater

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which allows microorganisms to treat the wastewater stream.

From the oxidation ditch, the waste stream travels to two secondary clarifiers. These large, concrete, open-top tanks allow additional time for remaining debris in the waste stream to settle out. Aerobic digestion is used to stabilize the secondary waste from the secondary clarifiers. The waste stream is then disinfected with chlorine and travels to holding tanks, where it is held to allow for adequate disinfection time. Once it is ready to be discharged into Hall Creek, the waste stream is dechlorinated using sulfur dioxide.

Aerobic digesters at Hall Creek

Sludge from the treatment plant is sent to the solids dewatering process through a belt press. Here, sludge is pressed to remove water. The sludge is then removed by truck for offsite disposal at an approved location.

Obtaining a satisfactory final effluent, prior to the stream discharge, depends to a large extent on developing and maintaining a healthy biological bio-mass in the activated sludge process. It is imperative that plant operators employ continuous monitoring, laboratory testing and evaluation of the operational parameters for the activated sludge process. VPDES requires that the wastewater treatment plant be staffed eight hours/day, seven days/week and 365 days/year. Licensed operator requirements are Class II Wastewater Operator.

If the WCSA receives waste that is not designed for the plant and its microorganisms, it can reduce the effectiveness of treatment or, even worse, kill all of the bugs and result in regulatory violations. It is for this and other reasons that we maintain a Sewer Use Ordinance and Sewer Use Rules and Regulations.

Damascus Wastewater Treatment Plant

The Damascus Wastewater Treatment Plant provides sanitary sewer service to the Damascus area of Washington County.

The treatment plant has a capacity of 250,000 gpd. The plant uses an extended-aeration activated sludge treatment process to treat the wastewater. Currently, the entire wastewater system is gravity flow, meaning there is no pump station within the system. Wastewater enters the plant and travels through a channel equipped with a mechanical screen that filters out large items of debris. Next, wastewater travels through an aerated grit removal channel to remove additional debris from the stream.

Chlorine contact tanks and effluent at Hall Creek

The wastewater then travels to parallel activated sludge reactors. The activated sludge reactors serve as the primary treatment for the wastewater and consist of parallel concrete tanks, each divided into two compartments. Wastewater flows into the concrete tanks, where air is added to provide oxygen, mixing and movement within the basins, which allows the microorganisms to treat the wastewater stream.

From the activated sludge reactors, the wastewater stream travels to two secondary clarifiers, each with a capacity of 47,451 gallons. These clarifiers are large, concrete, rectangular, open-top tanks that allow additional time for the remaining sludge in the stream to settle out. The wastewater stream is then disinfected with chlorine and travels to a holding tank, where it is held to allow for adequate disinfection time. Once all treatment is complete, it is ready for dechlorination, then discharged into the South Fork of the Holston River.

WCSA Introduces New Rate Plan

In early May, the WCSA Board of Commissioners approved the water utility's new rate plan, which features a decrease in water and wastewater connection fees, and an increase in monthly user fees.

Residential water connection fees have decreased from $4,560 to $1,628, while residential wastewater connection fees have been reduced from $3,800 to $3,235.

A typical WCSA residential water customer who uses 5,000 gallons per month will see an increase of less than a penny per gallon, or between $2 and $3 per month. Wastewater customers will experience similar cost adjustments.

WCSA Receives Gold Award

From left: Gary Van Huss, lab manager/compliance officer, and Joey Forster, class 4 operator

For the fourth consecutive year, WCSA was awarded the highest possible ranking in operations and performance excellence for water utilities by the Virginia Department of Health.

The Middle Fork drinking water plant was one of 30 conventional water treatment plants (out of 131 plants in Virginia) that received a gold award following a 12-month analysis of data by the VDH Office of Drinking Water.

Each year, the VDH recognizes drinking water plants that perform above and beyond minimum standards, optimizing their treatment process, and running it efficiently and effectively.

WCSA's Middle Fork plant earned a performance score of 20 in the judging criteria, with 20 being the highest possible score. The Middle Fork plant is one of only 24 plants in the state to earn a perfect score.

Water Trivia

- More than 25 percent of bottled water comes from a municipal water supply, the same place that tap water comes from.
- If you drink the recommended eight glasses of water per day from the tap, it will cost you about 50 cents per year. If you choose to drink the same amount from water bottles, it can cost as much as $1,400.
- Water makes up 55 to 78 percent of a human's body weight; 75 percent of the human brain is water.
- We have the same amount of water on earth as there was when the earth was formed. The water from your faucet could contain the same molecules that were once consumed by dinosaurs.
- There are approximately 1 million miles of water pipeline and aqueducts in the United States and Canada, enough to circle the earth 40 times.

Source: U.S. Environmental Protection Agency

WCSA Calendar

Labor Day
Sept. 1

Columbus Day
Oct. 13

Board Meetings

UPCOMING BOARD MEETING DATES

Aug. 25, 2014
Sept. 22, 2014
Oct. 27, 2014

Board meetings are held at WCSA in the E.W. Potts Board Room at 6 p.m. The public is welcome to attend.

Actual dates may vary. Please contact our office to confirm all meeting dates.

REMINDER

AVOID THE TIME AND EXPENSE OF MAILING AND POSTAGE WITH WCSA's AUTO-DRAFT, ONLINE BILLPAY, OR 24/7 PAY BY PHONE.

CALL OUR CUSTOMER SERVICE DEPARTMENT AT 276-628-7151 FOR DETAILS.

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