Shepherdstown Waste Water Treatment Plant

Ahead of the game in achieving Bay Initiative's Nitrogen and Phosphorous Requirements

Located along the Potomac River, Shepherdstown is home to nearly 1,200 residents and about 4,000 Shepherd University students. With a growing population and new federal regulations which set strict pollution limits to improve the water in the Chesapeake Bay, this environmentally active community jumped at the opportunity to make changes to help the bay. In October, 2012 Shepherdstown's new state-of-the-art wastewater treatment plant went on-line, putting the plant 2 years ahead of schedule in meeting the new water quality standards for nitrogen and phosphorous and making it one of the first plants in the area to do so.

The plant underwent about $10 million in upgrades, made possible by a $9.2 million, 30 year low interest loan (approximately 0.5%) from the WV Infrastructure Council. The town also had a rise in sewer rates by approximately 50% to help pay for the new plant. Public Works Director Frank Welch said that "Naturally, some customers were upset about the higher rates, but through an education program in newspapers, meetings, etc. most customers in Shepherdstown accepted the higher costs and are environmentally conscious. The town really *wants* to help the bay."

The new system has doubled the plant's capacity to 0.8 million gallons of water a day with a peak of 2.2 million gallons a day. Sewage is pumped from the town's lines to a screening area, which removes most of the solid materials. Screened wastewater goes to bioreactors, where biological treatment takes place and nitrogen and phosphorus are removed. After being processed through the bioreactors, water is sent through membrane tanks, full of membrane filters which allow for complete removal of particles larger than 0.03 micrometers. "The microscopic holes in these filters are so small, that even most viruses cannot pass through them" said Kenny Shipley, Chief Operator. After water leaves the filtration tank, it is treated in a disinfectant tank with ultraviolet lights (rather than chemicals) before it is sent to a holding tank, through a flow meter, and discharged to the Potomac River. The system achieves a reduction of 75 pounds of phosphorous and 957 pounds of nitrogen per month.

Once water has passed through the membrane tanks, it is clean enough to be reused in the plant for cleaning purposes, allowing the plant to save about 20,000 gallons/day by reusing their treated water. Although this treated water is not potable, it is as crystal clear as drinking water!

Brian Welch, Class I Operator proudly displays a bottle of the plant's crystal clear effluent.

“The water that we are discharging into the river is actually cleaner than the river water itself, as phosphorous levels are almost non-detect (a sample from January 8, 2014 showed < 0.040 mg/L Total Phosphorous). With this system, pollution does not occur simply because the particles *cannot* physically pass through the membrane tank. In the old system, solids were able to overflow into the river if peak flow was exceeded. Now, with our new membrane technology, overflow of solids cannot possibly occur” said Welch.

Currently, the treated solids from the plant are disposed of at the landfill. The plant would like to eventually be able to compost this material in order to make their operation more sustainable.