SuperSand™ Filters Improve TSS Removal, Exceed New York Requirements

Industrial Process Water Application

CASE STUDY

Location: **Silver Creek, NY**
Owner: **The Village of Silver Creek**
Engineer: **Wendel WD**
Contractor: **Wendel Energy Services LLC**

Raised Requirements

The Village of Silver Creek is known for having once been a part of the shipping industry on Lake Erie. It is located within the town of Hanover, New York, on the eastern shores of the lake.

The village's water and sewer system discharges Silver Creek's wastewater where Walnut Creek and Silver Creek meet and empty into Lake Erie.

Because of high levels of Total Suspended Solids (TSS) in the discharged water, the New York State Department of Environmental Conservation (NYDEC) issued a consent order to Silver Creek to start a tertiary treatment for TSS. With the tertiary treatment, the new State Pollutant Discharge Elimination System (SPDES) permit requires 85% removal of TSS from the influent water.

Solution

Previously, Silver Creek did not have tertiary treatment system; one was needed to meet the new SPDES permit. WesTech's SuperSand™ filters were chosen for their low cost and superior performance.

Image: Water distributor

Intermittent Option for SuperSand Filters

The SuperSand Continuous Backwash Filter is an up-flow, moving bed filter that is constructed with various media depths for different applications and configurations. It employs a backwash rinse that is performed continually while the tank is processing water.

The intermittent wash option is an upgrade that allows the SuperSand to operate in either continuous or intermittent mode. When a filter is brought into service in the intermittent backwashing mode, the Intermittent Air Control Panel (ACP) will monitor a float switch in the filter. Once the water level rises sufficiently to flip the float switch, the ACP will open the waste

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valve, initiating an air burst. By opening the air burst solenoid in the air control panel, air is able to flow through the needle valve and into the filter modules in the basin.

Simultaneously, the ACP will start an operator-adjustable timer having a minimum time of 20 seconds and a maximum time of 3 minutes (normal operation will be 1 minute). Once the timer runs out, the ACP will signal the burst solenoid valve to close and will open the regulated flow solenoid valve, allowing air to flow through the rotameters and into the filter.

Airlift pumps will be required to run for a minimum amount of time set by the operator before backwashing stops. Currently, the Silver Creek Wastewater Treatment Plant has a run time of 15 minutes for every hour of filter operation. After the required run times out, the Intermittent Wash Control Panel (IWCP) will close the waste valve. It will also close the solenoid valves in the air control panel, stopping air flow to the air lift pumps. The air lift pump will remain shut down for the operator-adjustable time.

Implementation

With an average flow of 50,000 gallons per day, the filters' influent water averages 27.2 mg/L of TSS. Since the filters have been in operation, TSS and BOD_5 levels in the effluent water have decreased dramatically. Plant operators have reported an average of 98% removal of BOD_5 and TSS and a minimum of 95% removal of BOD_5 and TSS. The filters are programmed so the loading rates do not exceed 6 gpm/ft^2. This is a factor of safety the operators have set in order to prevent the filters from going out of service. Based on the performance, operators are confident the filters can be operated with higher loading rates.

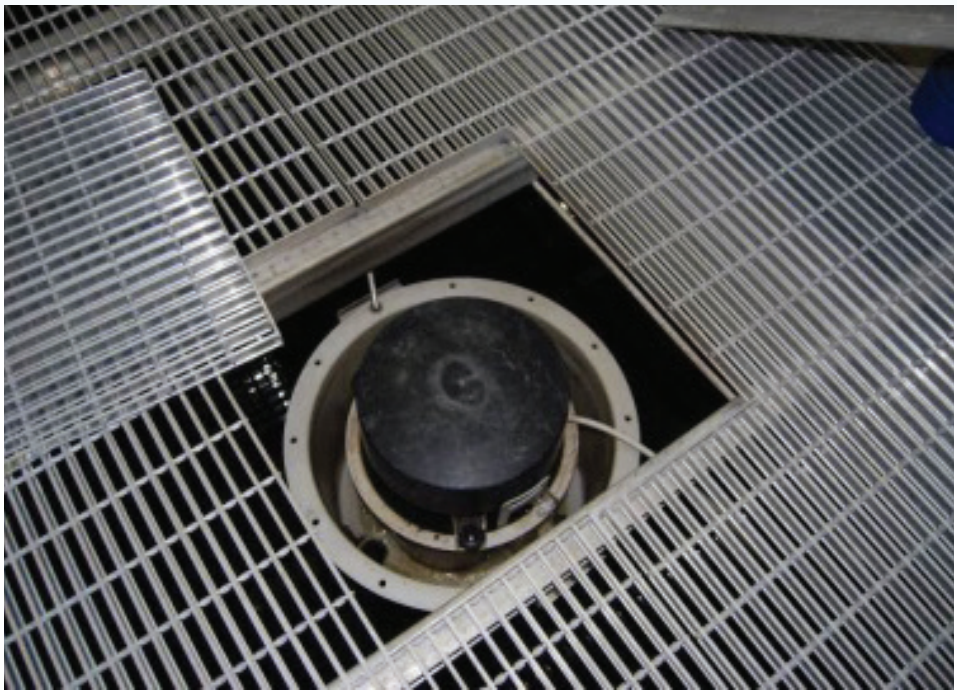

Image: Washbox

Influent vs. Effluent TSS	
Inlet (mg/L)	27.2
Average Outlet (mg/L)	0.544
Minimum Outlet (mg/L)	1.36

The success of the SuperSand filters installed has helped the Silver Creek Wastewater Plant to remove contaminants to achieve a water quality close to that of drinking water. This has made residents of the town feel more comfortable about the water being discharged into the heavily fished creek.

Operators of the Silver Creek Wastewater Treatment Plant highly recommend the use of SuperSand Filters with the intermittent wash upgrade.

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