



A Modular Treatment Solution

*E*levated levels of arsenic, iron and manganese prompted Brandywine Elementary School in Greenfield, Ind., a small town just east of Indianapolis, to seek a treatment solution for the school's drinking water. The water system is served by one well that provides drinking water for approximately 330 students in kindergarten to fifth grade.

By Richard J. Cavagnaro

In July 2009, Ladd Eng. Inc. contacted AdEdge Technologies Inc. to provide a proposal for the Brandywine Elementary School in the Southern Hancock School District.

Gary Ladd of Ladd Eng. chose AdEdge because he "started out working with another guy that the building supervisor worked with before. He did not know what he was doing with water treatment. Having worked with Greg [Gilles] in the past, AdEdge was the first company that came to my mind for the school."

Exceeding the Limits

Shortly thereafter, AdEdge was selected to provide a potable water treatment system for the school to reduce elevated levels of arsenic, iron and manganese that exceeded drinking water standards. The school has a daily usage of 5,000 gal of water per day.

The system selected was an AdEdge AD26 oxidation/filtration treatment system rated for 65 gal per minute (gpm). Incoming iron concentration is 1.2 milligrams per liter (mg/L), manganese is 0.045 mg/L and arsenic is 0.011 mg/L, all above the U.S. Environmental Protection Agency (EPA) drinking water standards of 0.3 mg/L for iron, 0.05 mg/L for manganese and 0.01 mg/L for arsenic.

The AdEdge system was selected over other options because of its previous success and Indiana Department of Environmental Management (IDEM) permitted installations for removing these contaminants. IDEM typically requires filtration systems to be sized at a 3 gpm/sq ft loading rate, but because of AdEdge's success using the AD26 technology in other applications around the U.S., including a successful EPA Arsenic Demonstration Project in Clinton, Ind., IDEM approved the AD26 system's loading rate of greater than 6 gpm/sq ft. AdEdge assisted Ladd Eng. with the preparation of the design submittals to obtain all regulatory permits. The system was designed, fabricated, installed and started up in approximately two months and placed into full-time operation in October 2009.

How it Works

The modular arsenic, iron and manganese treatment system consists of two 30-in. carbon steel vessels, each rated for 65 gpm and capable of removing all three target contaminants consistently in a single process, below the standards set by EPA and IDEM. The versatility of the modular systems, combined with their smaller footprint due to higher loading rates, allowed for a system that was accommodated in the existing space so that a separate building or expansion was not needed. This modular approach is ideal for smaller system applications such as schools, churches or day-care centers.

Water is pumped from the well and injected with chlorine (sodium hypochlorite) via an in-line injection from an existing chlorination module to enhance the contaminant removal process. After it is treated by the chlorine feed system, the water moves into the modular filtration system utilizing

the AdEdge ADGS+ media. AdEdge ADGS+ is used for consistent removal of arsenic and iron, but is also used for manganese, hydrogen sulfide and radium removal in drinking water. The surface of the ADGS+ media contains manganese dioxide, which acts as a catalyst in the oxidation-reduction of iron and manganese.

The two carbon steel vessels are configured in parallel and were plumbed during installation along with all interconnecting plumbing. The modular treatment system is equipped with automatic controls, switches, gauges, flowmeters and sample ports. Backwashing of the system takes place every two or three days with one vessel backwashing at a time. The backwash water is discharged to a sanitary sewer after completion.

Back on Track

Since start-up, arsenic levels are below detection levels and iron and manganese are reduced to trace amounts. IDEM recognizes AdEdge's AD26 oxidation/filtration technology as a viable arsenic, iron and manganese removal technology for the state of Indiana.

"We haven't had any problems with the system," said Don Perdue, supervisor of building maintenance for the Southern Hancock School District. Perdue is satisfied with the system and so is Brandywine Elementary, which "is happy with it removing the arsenic, iron and manganese." *wqpp*

Richard J. Cavagnaro is marketing coordinator for AdEdge Technologies Inc. Cavagnaro can be reached at rjcavagnaro@adedge.com or 678.730.6506.

For more information on this subject write in 1001 on the reader service card or visit www.wqpmag.com/lm.cfm/wq061101.

System remedies elementary school's high arsenic, iron and manganese

Brandywine Elementary School serves 300 students in kindergarten to fifth grade.

