BluePRO Water Filtration System: Saving Water Resources And Money

University of Idaho

Municipalities and industrial plants are under pressure to meet increasingly stringent clean-water regulations, which often are costly to implement. But they may get some assistance from a cutting-edge firm that has commercialized an innovative water treatment process developed at the University of Idaho.

Municipalities and industrial plants across the United States are finding themselves between a rock and hard place.

On the one hand, they'll need to spend millions of dollars to improve their water treatment systems to comply with new clean water regulations. On the other hand, the existing technology to upgrade water treatment systems is not highly effective.

Much of their dilemma revolves around regulations to reduce nutrients such as phosphorus in discharged water by as much as 95 percent. Phosphorus, a vital nutrient in all living things, can be harmful when excessive amounts are in

lakes and streams. Too much phosphorus causes rampant algae growth, which further diminishes the quality of water and can kill fish and other organisms vital to aquatic ecosystems.

Conventional water treatment systems may be capable of reducing phosphorous levels to as low as 500 parts per billion. But in certain parts of the country, such as the Spokane River in the northwest United States, new phosphorous reduction regulations allow for only 50 parts per billion — far below the water cleaning capabilities of conventional systems.

Luckily, a new water treatment technology has entered the marketplace — and not a moment too soon.

It's called BluePRO™, a low-cost, low maintenance solution that is highly effective in removing phosphorus and other contaminants from water.

Scrubbing Wastewater With Coated Sand

The BluePRO™ filtration system is based on the pioneering research of Professor Greg Möller, Ph.D., and Remy Newcombe, Ph.D. The two conducted initial work on the technology at the University of Idaho in Moscow, under the sponsorship of the U.S. Environmental Protection Agency and other U.S. government agencies. In 2003, Blue Water Technologies Inc., based in Hayden, Idaho, was founded to commercialize the technology; it also obtained the license to the technology underlying BluePRO™.

Similar to existing water filtration systems, BluePRO™ uses sand as a key filtering agent. But it's not just ordinary sand that you might find at the beach.

Instead, it's coated with iron oxide, a rust-like property that is particularly absorbent. The specially coated sand scrubs phosphorus and other undesirable properties in wastewater that flows through large tanks. As the sand sinks from the top of the tank to the bottom, the iron oxide detaches and absorbs the phosphorus. Next, the water, sand and iron oxide are separated from each other by density. The clean water is pumped out, the sand is separated and removed for reuse and the waste solid containing iron oxide/phosphorous particles is removed for disposal.

"The sand filter is the core of our product," explains Tom Daugherty, president of Blue Water Technologies Inc. "These filters have no moving parts, so they're easy to maintain. And only up to 10 percent of the sand must be replaced annually over the 20-year life cycle of the filters. These are a few of the reasons why BluePRO is so cost-effective."

Depending on the size of the community involved, use of the BluePRO™ system can cost as little as $12 per household annually for about 20 years.

In cases like the Spokane River where conventional systems are incapable of reducing phosphorus to lower levels required by the EPA, other exotic systems involving reverse osmosis and membrane filtration could conceivably do the job, Daugherty says. "But their cost would be many times more than that of the BluePRO™ system," he says. And cost efficiency definitely is a critical issue when considering the scale of phosphorous reduction needed in the United States.

As much as half of the country's waters do not adequately support life because of excessive phosphorus and other nutrients, according to the EPA. To meet the EPA's lower phosphorous levels in these bodies of water, an effective, relatively inexpensive solution like BluePRO™ would help thousands of cash-strapped municipalities responsible for water treatment.

Putting BluePRO™ to the Test

In view of increasing regulatory requirements for cleaner water, it's no surprise that numerous potential customers have shown an interest in purchasing the BluePRO™ filtration system, especially given its affordability and ease of use. In fact, Blue Water Technologies Inc. created a portable trailer-mounted water treatment system to demonstrate the value of BluePRO™ filtration systems at various locations throughout the Northwest.

However, a number of companies and communities have been reluctant to invest millions to upgrade their wastewater treatment systems with BluePRO™, noting that it has been demonstrated only on a small scale — not in large-scale applications.

Undaunted, Blue Water Technologies Inc. teamed up with the town of Hayden, Idaho, to create a 1,200-square foot, $1 million dollar test facility connected to Hayden's wastewater treatment plant, capable of treating 1.5 million gallons of contaminated wastewater every day. Launched in May 2005, the Hayden Wastewater Research Facility showcases BluePRO™ technology in a real-life setting.

"The Hayden facility gives researchers at the University of Idaho and other institutions a full-sized environment in which trials and demonstrations of other experimental water treatment processes can be conducted," says Gene Merrell, interim director of the Idaho Research Foundation at the University of Idaho, and assistant vice president and chief technology transfer officer at the University of Idaho's University Research Office.

The main focus of the Hayden Wastewater Research Facility is phosphorous removal, given the EPA's regulatory push to reduce phosphorous levels in water.

"When it comes to phosphorus, natural water should have less than 40 parts per billion, and 20 parts per billion is even better," notes Möller. In late 2005 the Hayden facility dramatically surpassed clean water requirements.

> *The BluePRO™ system can lower phosphorous levels from 3,000 parts per billion to 10 parts per billion — a 99.7 percent reduction.*

Researchers at the Hayden facility are setting out to prove that a modified BluePRO™ process can remove other harmful substances besides phosphorus. These include arsenic, heavy metals and endocrine disrupters commonly found in detergents, birth control pills and other personal care and pharmaceutical products that are flushed down toilets or put down the drain. Endocrine disrupters are particularly worrisome, as they can cause cancer and birth defects, and can adversely affect immune and reproductive systems in humans and animals.

Improving the environment while saving money in the process may seem like a dream to most taxpayers and business executives. Yet this dream is quickly becoming a reality, thanks to the University of Idaho's groundbreaking scientific discoveries that are being perfected, commercialized and marketed by Blue Water Technologies Inc.

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