

OZONE WASTEWATER TREATMENT

dirty jobs

Need Clean Solutions

By Bob Smith-McCollum

“The weight of our civilization has become so great, it now ranks as a global force and a significant wild card in the human future along with the Ice Ages and other vicissitudes of a volatile and changeable planetary system.”

—Dianne Dumanoski, “Rethinking Environmentalism,” Dec. 13, 1998.

Portable wastewater treatment systems support Canada’s natural industries

Canada, the world’s second largest country after Russia, has a wealth of natural resources ranging from iron and timber to petroleum and natural gas. With 90% of its population concentrated within 160 km of the U.S. border, harvesting Canada’s abundant resources throughout the country will require sufficient infrastructure to preserve one’s entrepreneurial investment. Not surprisingly, Canada’s government is increasingly paying attention to the country’s delicate balance of economic growth and environmental preservation. It does not take watching Al Gore’s recent film “An Inconvenient Truth” to understand the global dynamics involved, but it

couldn’t hurt.

Some of the people in the nexus of economy and ecology are the ones at the beginning of the pipeline for those resources—the intrepid drillers, miners and loggers who supply North America’s industry with raw materials. Of growing concern is the environmental impact of retrieving those materials. What matters is not only the extraction process, but also the human infrastructure and waste processing. Wastewater treatment systems are a necessary part of any resource extraction project.

Ozone—a wastewater solution

One of the key challenges of the wastewater industry in North America



Seair’s ozone wastewater systems are housed in 40-ft containers for easy setup, breakdown and transport. Ozone is generated on site from concentrated oxygen and electricity from a diesel generator, and injected into the water with Seair’s diffusion system.

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is the ability to transport and run treatment equipment in remote and inhospitable locations. Due to the transient nature of many wastewater cleanups, a treatment system must be self-contained and mobile enough to be transported to the next site after an extraction is complete.

As they say, "It's a dirty job, but somebody has to do it." And the dirtier the job, the stronger the oxidant and sanitizer required. The amount of fecal bacteria, chemical oxygen demand, total organic carbon and total suspended solids in wastewater can be truly daunting,

especially for a remote application; however, ozone has been shown to significantly decrease these parameters with proper dosing.

Ozone, a dynamic allotrope of oxygen, has been used for more than 100 years as a critical application for water disinfection and sanitization. Ozone's reactivity makes it an excellent tool against viruses and organic material. Widely used in the bottled and municipal water industries, ozone's oxidative power and benign byproducts make it an integral solution for water treatment in modern global industry.

One company utilizing the powerful oxidation and sanitizing chemistry of ozone in wastewater is Seair Diffusion Systems, Inc. of Edmonton, Alberta. Seair specializes in the transfer and diffusion of gases into liquid for a variety of industries, including aquaculture, oil and gas, and agriculture, along with water/wastewater treatment systems.

Seair is currently expanding its portable ozone wastewater treatment fleet for the fall drilling season, when crews all around North America will set up camp to extract ores and oil. Just as those drilling operations supply the growth of industry, Seair's ozone wastewater treatment supports the human and infrastructure footprint of their camps. Because of ozone disinfection, these camps run as self-contained cities, complete with energy, living quarters, kitchen utilities and waste disposal.

Seair is enjoying an industrial and economic boom in western Canada and is serving a wide range of industries. "We've been fortunate to live in a region that is filled with growth and possibility," said Chris Kinasewich, chief manufacturing officer and director of Seair Diffusion Systems.

System setup

Each Seair portable wastewater treatment system includes two G21 ozone generators from Pacific Ozone Technology fueled by AirSep oxygen concentrators, a series of tanks, an

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automated control panel and three diffusion systems capable of treating 3,000 gal of raw sewage per day, meeting federal surface discharge regulations. The setup, in a 40-ft container, is mounted on transport skids and fueled by the camp's diesel generator.

With contracts running from around 100 days to as long as three years, it is important to have equipment that stands alone and can be moved easily. Ozone generators require minimal maintenance and no piping other than oxygen and water supply. Because ozone is generated on site and has oxygen as a main output of sanitization, it is an ideal gas for this remote, environmentally sensitive application. Already, Seair's customers are seeing the value of this environmentally safe wastewater treatment over harsher, and often less effective, alternatives.

"The awareness is starting to increase, and we're starting to see a very favorable response," Kinasewich said.

Seair's ozone treatment systems pump the wastewater through a three-stage treatment process. With a primary ozonation step, aerobic treatment and a final ozone application, the system is ultimately able to produce clean water safe for discharge back into the ecosystem.

Gas optimization through mass transfer



Seair offers a proprietary diffusion system to its customers, who rely on oxygen, ozone and water for their own processes and for effluent treatment. Part of the company's advantage is that it integrates top-of-the-line

components into its engineered solutions. Drawing high-purity oxygen from AirSep concentrators and featuring air-cooled corona discharge ozone generators from Pacific Ozone Technology, Seair uses Mazzei's venturi injectors to ensure the best quality gas application in its patented diffusion chambers.

This simple yet effective technique allows ozone to be applied quickly and consistently in a variety of applications, especially ones in which standard diffusion may not suffice or even be feasible. The creation and injection of 5-micron bubbles in the water flow creates this optimum stable gas concentration

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A simple onsite test demonstrates the removal of solids and greatly improved water quality produced by ozone wastewater treatment.

for every customer's application.

Clearly, a tool as dynamic and powerful as ozone will have impressive results when applied correctly. Sound stoichiometry and process engineering are required for successful ozone treatment, but as Seair and its customers are showing, the impact can be profound.

Dirty jobs need clean solutions, and Seair's ozone wastewater treatment systems make simple work of creating clean water—a small victory in the big picture, but one that makes a world of difference for industrial customers.

"There's no real comparison. It's peace of mind for the customers," Kinasewich said of the ozone treatment systems' impact. "Our technology has been opening up a lot of doors. We've optimized our customers' existing products, lowered their annual operating costs and given them an environmentally conscious solution."

In the end, while industrial

projects are always going to have environmental consequences, using ozone for wastewater treatment is a business solution that increases operational flexibility and mitigates ecological impact. Ozone is not just "green" business. It is good business. As environmental technology develops from industrial innovation and as consumer awareness is raised, progressive business practices gain ground and alter the global market. **WWD**

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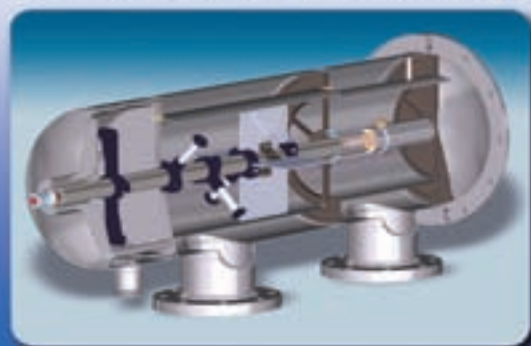
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