MIEX® PRESS

ORICA WATERCARE

What's Inside

Letter From the Editor

Welcome to the April edition of MIEX®PRESS. With Spring well underway, we find ourselves in the midst of yet another busy season of trials throughout the U.S.

Currently, all pilot units are in the field for numerous applications including one for combined DOC and arsenic removal where early treatment results have been very favorable. Check out the next issue for a detailed update.

On another exciting note, the first industrial application of the MIEX® Technology in the semi-conductor industry began operation this month at Cree Inc. in North Carolina, providing the manufacturer with significant cost-savings.

Read on for breaking news on GAC price increases and the launch of the low waste MIEX® Nitrate Removal System. Also included in this issue are the impressive full-scale results of the High Rate MIEX® System at Cedar Key, Florida as well as details on the Wedgefield installation due to start up in August 2007 for combined DOC & sulfide removal.

As always, we hope you enjoy this issue of MIEX®PRESS. Feel free to contact me if you'd like further information on any of the featured articles.

Best Regards,

Stephanie Schnider

Stephanie Schnider

www.miexresin.com

MIEX® Nitrate Removal System Launched

Customers have been asking for it and we've responded in providing MIEX® and MAGNAPAK® systems for nitrate removal from drinking water supplies. Technologies to remove nitrate are being sought after as rising demand and scarce water supplies are forcing many utilities to consider water sources previously ignored due to the presence of nitrate. In areas of intense agricultural activity, existing ground water supplies that were previously in compliance with the EPA's nitrate limit of 10 mg/L (as N) are now also finding the need to treat these water supplies as nitrate levels approach the limit. As nitrate is classified as an acute toxin, any exceedance of the EPA limit is considered a violation, so even where systems only have nitrate levels at or above 10 mg/L for a short period each year, treatment must be installed to allow the water source to continue to be used.

Traditionally, the only feasible treatment options available for removing nitrate from drinking water supplies have been ion exchange and reverse osmosis. Both of these options generate a significant amount of waste that can be difficult to dispose of. Nitrate is an anion and

(See ***Nitrate Removal*** on Page 3)

Cedar Key Back in Compliance

Following a successful pilot trial completed in February 2006, the Cedar Key Water & Sewer District, FL ordered a 250 gpm MAGNAPAK® System (MP250HR) to bring its water treatment plant into compliance with the EPA Stage 1 DBP Rule. Prior to installation of the MAGNAPAK® System, the Cedar Key WTP had amongst the highest DBP levels in Florida. The MAGNAPAK® System was delivered in late October and went into continuous service in November 2006. The system was installed as pre-treatment to an existing lime softening plant with chlorine dosing used for iron removal and disinfection.

In the 4th quarter of 2005, prior to installation of the MAGNAPAK® system, the District's distribution system running annual average (RAA) for TTHMs was 239 µg/L. After only two quarters' operation of the MAGNAPAK® system the RAA level for TTHMs was brought to below the EPA limit of 80 µg/L (Table 1).

Table 1

Parameter	2005, Q4 – prior to MAGNAPAK® System	2007, Q1 – after to MAGNAPAK® System Start-up
TOC (mgL)	5-7	2.2
TTHM (µgl)	239*	61.6

* 2005 RAA TTHM Level

Additional benefits identified since the MAGNAPAK® system went on-line include a 20% reduction in lime usage and over 60% reduction in sodium hypochlorite dosage.

MAGNAPAK® System Purchased after Chloramines Cause T&O Complaints

Two 500 gpm MAGNAPAK® Systems are currently in construction for TOC & sulfide removal at Utilities Inc. Wedgefield, FL (Utility), due to start-up August 2007.

Wedgefield is a growing community east of Orlando, Florida. The Utility receives raw water pumped from groundwater wells. Raw water is currently treated using tray aeration for the removal of hydrogen sulfide, then cation softening followed by chlorine disinfection.

As a result of dosing free chlorine, the Utility began to experience problems with Disinfection By-Products (DBPs). To address the issue, chloramination was implemented on a temporary basis while evaluating technologies to provide a permanent solution to their DBP problem.

Trial Results

The MIEX® Process was trialed at the Wedgefield Water Treatment Plant (WTP) from November to December 2005.

During the pilot trial, typical raw water DOC levels ranged from 4.93 - 6.79 mg/L. Throughout the trial, MIEX® Pretreatment removed on average 61% of DOC from raw water.

Historical DBP averages were 136 µg/L for TTHMs and 78 µg/L for HAA5s. Due to the reduced organics load, the average TTHM after the MIEX® Pretreatment was 57.1 µg/L and 11.8 µg/L for HAA5s, both well below the EPA Stage 1 and Stage 2 Maximum Contaminant Levels (MCLs).

Hydrogen sulfide was also an issue, and the MIEX® Process was able to reduce concentrations from an average of 2.70 mg/L to 0.062 mg/L, for a 97.7% reduction.

During the implementation of chloramination on a temporary basis, the utility experienced operational problems and received significant customer complaints, due primarily to degradation of flapper valves and other elastomeric materials. The utility also started receiving taste and odor complaints, which were associated with a lack of biostability in the distribution system.

The utility evaluated several processes including MIEX® treatment and a proposal was put forth using the MIEX® Dual Stage configuration for optimum removal of TOC & sulfide. The decision was made to implement MIEX® Treatment, and the contract was awarded in February 2007. The MIEX® Installation will consist of two parallel 500-gpm MAGNAPAK® Systems (approximately 1.44 MGD). By August 2007 upon start-up of MIEX® Treatment, Wedgefield Utilities will be able to return to free chlorine disinfection.

Tariff to Increase GAC Prices Significantly

Import price expected to increase by up to 228%

In response to complaints by Calgon Carbon Corp. and Norit Americas, Inc., in October 2006 the U.S. Department of Commerce (DOC) issued a preliminary tariff notice imposing antidumping duties on activated carbon imported from China. Dumping is when a foreign company sells a product in the United States at less than fair market value. On February 26 the DOC announced its final determination in the antidumping investigation confirming that Chinese producers/exporters have sold activated carbon in the U.S. at 62 to 228 percent less than normal value. Activated carbon includes granular, powdered and pelletized carbon products. As a result of the DOC final determination, U.S. Customs and Border Protection have been instructed to collect a cash deposit or bond at the rate of the final dumping margins, effectively increasing the import price of carbon by 62 to 228 percent from the current purchase price. On March 29 the U.S. International Trade Commission (ITC) voted to affirm the determination by the DOC finding that the U.S. industry is materially injured by imports of activated carbon from China sold at less than fair value according to a press release on the ITC website (www.trade.gov). The ITC will formally notify the DOC of its decision on April 16, when the DOC is expected to issue its order to start collection of the new tariffs.

Impact on Water Utilities…

According to industry sources, domestic suppliers have had to hold down prices for the past five years to remain competitive with imports. A tariff on imported carbon will now allow domestic suppliers to impose price increases on customers. As reported in the March issue of Water & Wastes Digest, carbon price increases will be expected to flow through to customers in the next few months. These price increases will have a significant impact on the economics of using GAC to remove DBP precursors for compliance with the EPA's DBP Rules. There are several very large GAC systems under construction that were approved some time ago based on the prevailing GAC price. Engineers will now need to factor in significant increases in GAC (and PAC) prices when evaluating new installations for TOC removal while water utilities with existing GAC systems or that dose PAC will have to budget for large increases in operating costs.

Sources:

U.S. International Trade Association Press Release, Feb 23, 2007 (www.trade.gov)

Water & Wastes Digest, Editorial, March 2007

WaterTech Online, 4/9/2007

Nitrate Removal *(from Page 1)*

thus can be removed by ion exchange using the MIEX® Resin. Customers familiar with the very low waste volumes produced by the MIEX® ion exchange process had suggested that if this advantage could also be applied to nitrate removal applications, it would offer a significant advantage over the alternative treatment options. In the past year, tests have been carried out to optimize the MIEX® resin properties and process design for nitrate removal and a MIEX® nitrate removal process has now been developed that provides several significant benefits over traditional nitrate removal technologies. A summary of the benefits of using the MIEX® Process for nitrate removal are as follows:

- Lowest waste volumes of any nitrate removal technology (see Table 1).
- No risk of chromatographic peaking.
- Can tolerate low free chlorine residuals to prevent bacterial growth without the risk of NDMA formation.
- Co-removal of other anions of concern such as TOC and arsenic.

Table 1: Waste Volumes for Nitrate Removal Technologies

Treatment System	Waste Volume	
	gal/MG	% Throughput
MIEX Process	1,000-2,000	0.1-0.2
Packed Bed Ion Exchange	10,000-20,000	1-2
Reverse Osmosis	100,000-200,000	10-20

Treatability tests have been conducted on water sources with a wide range of characteristics to determine appropriate system design parameters. If you have a nitrate removal application, contact us for a comparison of the MIEX® Process versus other treatment options you are considering.

AWWA Annual Conference 2007

The Annual AWWA Conference & Exposition is quickly approaching. Set for June 24-28th this year, it will be held at the Metro Toronto Convention Centre in Toronto, Ontario. We look forward to seeing many of you there.

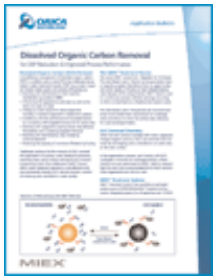
On display we'll have a working model of the High Rate MIEX® System as well as treatment results from full-scale installations. We will also be showcasing our new Nitrate removal system that results in lower waste volumes than alternative technologies and is not subject to chromatographic peaking.

Additionally, we will have information on our pressurized systems for wellhead applications. So be sure to stop by and learn more about how this system can be applied to take advantage of existing pressure and provide you with significant cost-savings.

ACE07 Orica Watercare booth # 1851

New Brochures

Check out our website at www.miexresin.com for new literature, including two equipment brochures for both High Rate & Dual Stage configurations as well as new application flyers.



MIEX® Seminar: Strategies for DBP Compliance

Orica Watercare & Hydrologx recently conducted an educational seminar on EPA Disinfection By-Products Regulations and Compliance Strategies with a focus on the MIEX® Process. The half-day seminar was held March 13th in Louisville, Colorado. Approximately 30 operators and engineers from throughout Colorado attended and were able to obtain training units for their participation.

A detailed case study on the MAGNAPAK® System at Big Elk Meadows, CO was presented, and attendees were able to hear first-hand feedback on its benefits from operators Nelson & Carole Renouf who were in attendance.

Employee Spotlight: Forrest Vaughan, P.E.

Forrest Vaughan has been working with the Watercare team since February of 2006 as the Senior Systems Engineer. He dedicates most of his time to the support and service of currently running MIEX® and MAGNAPAK® Installations. Additionally, he works on technical service and system integration of the MIEX® Technology in the U.S.

Forrest came to OWI with over 30 years experience in planning, permitting, design, construction, and operation of water and wastewater facilities. He has held positions in construction, state regulatory agencies, municipal utilities, and project management and consulting in the water treatment industry. He has helped facilities ranging from 1,000 gpd to 400 MGD capacity, using many different unit processes.

In his job, Forrest most enjoys helping customers find innovative and effective solutions for their treatment process issues. During his free time, he enjoys tennis and hiking with his family. He also enjoys watching his two sons in sports and cheering for the U of Florida Gators (his alma mater) as they win back-to-back national basketball championships.