



# MIEX<sup>®</sup> PRESS

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## A Letter From the Editor

Welcome to the April issue of MIEX<sup>®</sup>PRESS! Spring has quickly come upon us and along with it, the increasing interest for MIEX<sup>®</sup> trials throughout the U.S. Though we are still in April, our engineering team is already preparing for a packed trial schedule this summer.

In addition to the numerous trials this summer, we are also gearing up for the Annual AWWA Conference & Exhibit in San Francisco June 12-16. We will be sharing Booth #1937 with WesTech Engineering and we hope to see you there. Be sure to check the schedule for papers as

we currently know of at least 3 papers that will be covering MIEX<sup>®</sup> related projects.

This issue of MIEX<sup>®</sup>PRESS is packed full of new projects and exciting updates and events-one of which being the MIEX<sup>®</sup> Technology Seminar and plant tour recently held in Florida on April 1. Over 50 delegates from the water industry met in Ft. Lauderdale to learn more about the MIEX<sup>®</sup> Technology and to tour the Main and R.L. Pratt WTPs at the Village of Palm Springs. The enthusiasm for the MIEX<sup>®</sup> Technology was most apparent as the delegates toured the plants and were able to see first hand how the MIEX<sup>®</sup> process works.

We hope you enjoy this issue of MIEX<sup>®</sup>PRESS. Please feel free to contact me with any

## What's Inside

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questions regarding the featured articles.

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## Delegation Tours First Operating U.S. MIEX<sup>®</sup> Installations



Water industry delegation that toured the R.L. Pratt MIEX<sup>®</sup> plant

On Friday, April 1st over 50 representatives from the water industry from across the country gathered to participate in the 2005 MIEX<sup>®</sup> Technology Seminar and plant tour in Ft. Lauderdale, Florida.

The MIEX<sup>®</sup> Technology Seminar consisted of several speakers covering topics ranging from EPA regulatory updates and MIEX<sup>®</sup> Process advancements to several in-depth case studies of current MIEX<sup>®</sup> Projects. The educational portion was then followed by guided tours of the first two operating MIEX<sup>®</sup> installations in the United States located at the Village of Palm Springs, Florida. Commissioned in January, these MIEX<sup>®</sup> installations are providing water to a community of around 50,000

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## MIEX<sup>®</sup> System: Best Fit for City of Napoleon to Reduce DBP Levels

For many small systems serving less than 10,000 people, January 1, 2005 will be known as 'DBP judgment day'. This is the day when the first full year of quarterly TTHM and HAA5 samples has to be averaged to determine if these systems are in compliance with the EPA Stage 1 Disinfectants/Disinfection By-products Rule (D/DBPR) which came into effect for small systems January 2004. The City of Napoleon's water treatment plant (WTP) is one of the many small systems serving fewer than 10,000 people that is having difficulty meeting the EPA's Stage 1 D/DBP Rule.

The City's 4.5 MGD WTP serves just over 9000 people and sources water from the Maumee River. Treatment consists of conventional coagulation with aluminum sulfate followed by sedimentation and filtration and then final disinfection using free chlorine. With the first full year of sampling almost complete, Utilities Superintendent, Roger Noblit, said that the City is currently averaging slightly above the TTHM standard after three quarters of sampling. However, when the last quarter of sampling is completed, he says the plant will probably just meet the standard based on the annual average. The City has been aware of how close it will be to meeting the new DBP standards and over the past few years has conducted a number of studies to determine how to achieve compliance. The current plant operating conditions have been optimized and currently the plant is close to meeting Stage 1 requirements but will likely not meet the future Stage 2 regulations. "We have had recommendations to spend over \$1M on plant improvements but none of these will help us meet the Stage 2 standards," said Noblit. Although the MCL for TTHM and HAA5 compliance will remain the same, the Stage 2 DBPR will be much more difficult for utilities to comply with.

EPA is scheduled to release the Stage 2 D/DBPR by Fall 2005. The Stage 1 D/DBPR allows for distribution system wide averaging of representative quarterly samples. In an attempt to reduce DBP peaks within a system, Stage 2 will require utilities to:

- ♦ find the locations where TTHM and HAA5 peaks are occurring, and
- ♦ average quarterly samples at these individual peak locations to determine compliance with the MCL.

Roger read in trade journals how the MIEX<sup>®</sup> technology had been successfully applied for DBP reduction in Florida and Australian installations and approached Orica Watercare to see if MIEX<sup>®</sup> treatment could resolve his plant's disinfection by-product problems. During the summer

of 2004, when DBP formation is highest, the MIEX<sup>®</sup> Process was trialed to determine if this pretreatment process would bring the WTP into compliance with the Stage 1 and 2 Standards.

The data clearly shows that the addition of the MIEX<sup>®</sup> pretreatment system followed by alum coagulation will consistently produce finished water with both TTHM and HAA5 concentrations well below Stage 1 and Stage 2 standards. The following finished water quality targets were achieved during the pilot operation.

**Table 1: Finished Water Quality during MIEX<sup>®</sup> Trial at Napoleon WTP**

Parameter	Units	Target	Achieved
UVA	cm <sup>-1</sup>	< 0.050	0.029
TTHM SDS	µg/L	< 80	60
HAA5 SDS	µg/L	< 60	30

SDS Conditions: 24 hrs @ 20° C

"I was very happy with the trial results where MIEX<sup>®</sup> pretreatment provided a 60 percent reduction in the treated water TTHM formation potential over the current treatment process while allowing a 45% reduction in our coagulant dose," said Noblit. "MIEX<sup>®</sup> resin removes the root of the disinfection by-product problem (DOC) rather than applying a band-aid to it such as chloramines. . . I don't see anything else on the horizon that works as well as the MIEX<sup>®</sup> Process," said Noblit. "The process is easy to operate and as a pretreatment process it fits really well into our plant."

The City of Napoleon has now budgeted to have a Preliminary Engineering Design Report for a MIEX<sup>®</sup> system completed in 2005 so that installation of a MIEX<sup>®</sup> treatment plant can be completed in 2006.

Good planning by the City of Napoleon has allowed the City to find an effective solution to its DBP problems that will eliminate the anxious wait when quarterly samples are averaged at the end of each year to determine Stage 1 D/DBPR compliance. While providing peace of mind for meeting the current standards, the MIEX<sup>®</sup> process will also provide long term comfort for meeting the future Stage 2 Standards.

## First MIEX<sup>®</sup> Plant in Europe started up in Belgium

The first continuously operated MIEX<sup>®</sup> plant in Europe recently started to produce water near Ghent in Belgium.

In mid March, Flemish water company VMW and Orica completed the commissioning of 1200 m<sup>3</sup>/day GPM MIEX<sup>®</sup> plant at Kluizen. This project is an integral part of VMW's investigations for an improvement in the removal of DOC at this site. The MIEX<sup>®</sup> pre-treatment is expected to dramatically reduce the current coagulant demand and deliver other benefits for the downstream Ultra-Filtration and Ozone/Biological GAC processes. Of particular interest to VMW is the beneficial effect MIEX<sup>®</sup> treatment may have on the biological stability of treated water.



First MIEX<sup>®</sup> plant in Europe located in Kluizen, Belgium

Water produced by MIEX<sup>®</sup>/UF/O<sub>3</sub>/BGAC treatment will be fed into the distribution system together with the output from Kluizen's full scale facility.

Later in the year the MIEX<sup>®</sup> plant will be upgraded with a waste brine treatment plant. This will be used to reclaim brine for reuse in the MIEX<sup>®</sup> process, as well as produce a minimal final waste stream in the form of a high solids filter cake for off site disposal.

The background to VMW's drinking water treatment process development work, as well as the results so far will be presented this June by Jan Cromphout of VMW at the 3rd IWA Leading Edge Conference in Water and Wastewater Technologies in Sapporo, Japan on June 6-8.

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## Delegation Tours *(from Page 1)*

people served by the Village of Palm Springs, located in east central Palm Beach County.

The MIEX<sup>®</sup> systems have been installed in front of existing lime softening processes at both the Village of Palm Springs' Main (6 MGD) and R.L. Pratt (4 MGD) Water Treatment Plants to remove dissolved organic carbon (DOC) from the source water prior to disinfection, thus enabling these plants to meet tightening EPA DBP standards.



The morning seminar, covering numerous topics related to the MIEX<sup>®</sup> Technology

Eckler Engineering, Inc. managed the installation of the two plants; the construction contractor was John J. Kirilin, Inc. and the MIEX<sup>®</sup> system equipment packages for both installations were provided by WesTech Engineering, Inc.

The seminar and tour showed first hand to delegates how the MIEX<sup>®</sup> technology can be implemented to meet new DBP standards and provided the opportunity to speak with the project manager and operators of the MIEX<sup>®</sup> plants.

## Beth Hamm goes to Washington, D.C. for EPA Stage 2 DBPR Update

The Environmental Protection Agency (EPA) held a public meeting to discuss recent research related to the proposed Stage 2 Disinfectants and Disinfection Byproducts Rule (DBPR) on January 18, 2005. Beth Hamm was in attendance along with 50-60 others.

Over 190 different research projects were evaluated in the structuring of the Stage 2 proposed regulation. Even after reviewing new science available on DBP health effects and DBP occurrence and formation, EPA makes the following statement:

*"The available science continues to support incremental regulatory changes aimed at lowering DBP peaks and providing equitable public health protection."*

EPA also stated, *"Changes in treatment and disinfection practices may result in changes in classes or types of DBPs. Recent studies have highlighted the following areas in which more research is needed, including nitrogenous DBPs, iodo-DBPs, and other unknown DBPs."*

*"The available science continues to support incremental regulatory changes aimed at lowering DBP peaks and providing equitable public health protection."*

- EPA

Concerning nitrogenous DBPs and iodo-DBPs, EPA commented that sufficient research has yet to be conducted to determine the severity of these two classes, but that initial epi and tox data suggested a link between these additional unregulated DBPs and cancer. EPA made the comment that regulating TTHM and HAA occurrence is currently the best approach to protect public health concerning any DBPs. We may see halonitromethane, di- and tri-halonitromethane, nitrosamines and odoacetic acid on the next round of unregulated contaminant monitoring list (possibly 2009).

Several persons in attendance had public comments to make. A few of those making comments where: Stuart Krasner, Metropolitan Water; Phillippe Danell, CDM; Thom Schaffer, AWWA; Alexa Obolensky, Philly Water Dept.; Hiba Shukairy, Cincinnati EPA; Alan Roberson, AWWA; Erik Olson, Natural Resources Defense Council; Carol Graves for the Chlorine Chemistry Council; Chris Owen, Tampa Bay Water.

There are currently many draft guidance manuals available through EPA's - Safewater website. Currently available guidance manuals include the following: IDSE, Small Systems, Consecutive Systems, Significant Excursions, and the Simultaneous Compliance Manual.

AWWA is currently hosting a roaming workshop for the IDSE with only three more scheduled stops in 2005 (see <http://www.awwa.org/education/seminars/index.cfm?SemID=50> for details).

In summary, the Stage 2 DBPR is on schedule for publication by this fall with promulgation inevitable.

## Upcoming Conferences

Stop by our booth to hear more about new MIEX<sup>®</sup> installations and projects!

### Florida Water Resource Conference

April 24-27  
Jacksonville, FL  
Booth #501

### AWWA Annual Conference

June 12-16  
San Francisco, CA  
Booth #1937

We know of at least 3 papers on the MIEX<sup>®</sup> Technology to be presented at the Annual Conference. Be sure to check the schedules so you don't miss them!

## MIEX<sup>®</sup> Trivia

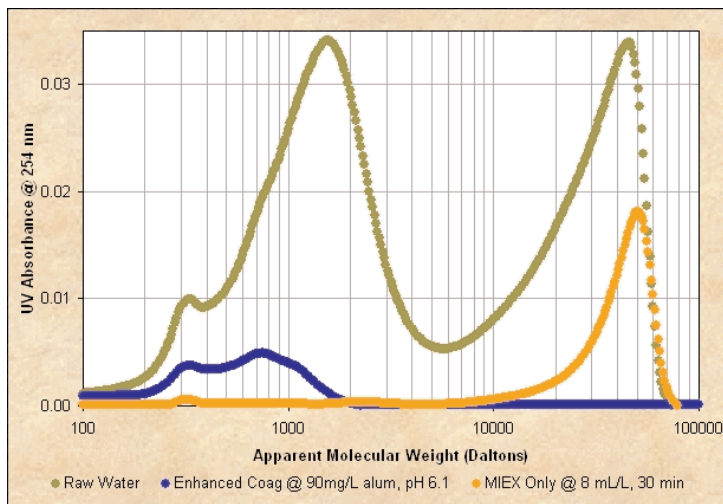
### Low MW TOC Removal

One of the key benefits of the MIEX<sup>®</sup> resin is its ability to effectively remove the low molecular weight fraction of DOC that cannot be easily removed by enhanced coagulation.

Humic substances are anionic, and typically of low to moderate molecular weight. These substances represent the major component of natural organic matter (NOM) in water supplies. They are derived from soil and are also produced within natural water by chemical and biological processes. The lower molecular weight fraction typically consists of organic acids.

The figure below clearly illustrates that the MIEX<sup>®</sup>

DOC resin and coagulation are preferentially removing different DOC fractions on this water source, thereby providing greater overall DOC removal when used together. This resultant reduction in DOC will result in lower disinfection by-product (DBP) formation potential, and MIEX<sup>®</sup> pretreatment will reduce coagulant demand. These results demonstrate the synergies that can be achieved by combining the MIEX<sup>®</sup> DOC resin treatment with the existing treatment process when a water source has



High Performance Size Exclusion Chromatography analysis of samples from the Wanneroo Ground Water Treatment Plant, Western Australia.

two distinct high and low molecular weight DOC fractions.

## Employee Spotlight: David Schelbach



David Schelbach

After graduating from the University of Queensland in 2000, David Schelbach began working as a Chemical Engineer in Orica's Incitech business in Queensland, Australia. He recently moved to the Denver office in July 2004 to work with the U.S. Watercare team. Although his official title is Field Engineer, David has taken on additional duties of the team's Safety Coordinator and Lab Steward. David also handles coordination of the field engineering work for the Watercare team throughout the U.S. David most enjoys the travel his role involves because it gives him the opportunity to see and experience so much of the U.S.

David's favorite thing about Colorado can be summed up in two simple words- the outdoors. He loves the Rocky Mountains and hiking and biking when the weather permits.