

## Authors to be Honored

Please submit your PowerPoint presentation for review by the Technical Program Committee if you present in Ohio at an AWWA or OTCO District or State Conference/Workshop. A Subcommittee will pick the best one for the “**Best Paper**” award to be presented in September at the Ohio AWWA State conference in Cincinnati.

More than one Best Paper Award will be selected if the Subcommittee receives several PowerPoint submittals in any of the following author categories.

- water system operator
- water system administrator
- regulator,
- manufacturer rep, or
- design consultant.

A separate Subcommittee will continue this year to review articles from the latest three Ohio Section Newsletters, and will pick the best one for the “Best Newsletter Article” award – also to be presented in September at the State conference in Cincinnati.

The Technical Program Committee plans to continue expanding the number and type of publication/presentation awards. Please submit your PowerPoint and/or ideas for additional types of publication/presentation awards to:

**Tim Wolfe**  
**Technical Program Committee**  
**Montgomery Watson Harza**  
 85 E. Gay Street  
 Suite 1100-A  
 Columbus, OH 43215  
 614.220.5650  
 timothy.a.wolfe@us.mwhglobal.com • 740-630-7294

## Young Professional of the Year Award

**The American  
 Water Works  
 Association**



**Ohio Section  
 2006-2007  
 Young Professionals  
 Committee**

To honor the work that young professionals contribute to the field of water, the OAWWA plans to recognize one young adult (35 and under) as YP of the year 2007.

This award celebrates the commitment to water and the embodiment of the AWWA core characteristics through a professional capacity. Nominees represent the effort to increase knowledge, information, and advocacy to improve the quality and supply of water.

A selection committee will be accepting email and written nominations until June 30, 2007. Nominations shall include name and contact information as well as achievements and reasons for recommendation of a nominee (no self nominations). Stay tuned to the

OAWWA website and/or the newsletter for information on how to submit your nominations.

Certificate of award accompanied by a free one year membership to AWWA will be presented at the 2007 state conference.

Please forward any questions to:

**Franco Noce**  
**Baldwin Water Works**  
 11216 Stokes Blvd  
 Cleveland, Ohio 44104  
 216-533-7210  
 Franco\_Noce@clevelandwater.com



# Ohio Section American Water Works Association

## 2007 Student Paper Competition Oral and Poster Presentations

### RULES OF COMPETITION

New for 2007: This year's student paper competition will again be extended to engineers who have graduated within the past year and are now in their first year working in an engineering field. Applicants should indicate the forum in which they prefer to present their papers. The top three oral presentation abstracts and the top poster abstracts will be selected for presentation at the Annual Conference. Cash awards of \$300 each will be presented to the three speakers and \$200 will be awarded to the best poster. Also all students who submit will receive an AWWA student membership for one year.

***All abstracts that do not comply with format guidelines (i.e. word and figure/table limits) will NOT be considered!***

**Topic:** Any paper discussing source water protection, drinking water treatment, analytical methods, water distribution and storage, or other water-related concern is invited.

**Abstracts:** The abstract and competition application (see below) should be submitted to Ohio AWWA by July 31, 2007. Applicants should indicate whether they would like to present their abstract as either a poster or an oral presentation. All students who submit abstracts will receive free registration to the Ohio Section Annual Conference. The conference will be held September 18-21, 2007 at the Hilton Cincinnati Netherland Plaza Hotel, Cincinnati Ohio. All submitters will be notified by August 15, 2007 about the status of their abstract.

**Selection Criteria:** Abstracts will be judged on their relevancy to the drinking water industry and the originality of the ideas, concepts and solutions presented.

**Oral Presentations:** The authors of the three selected abstracts will give a 20 minute presentation followed by a 10 minute discussion period. All oral presenters will be given a \$300 cash award and a certificate.

**Poster Presentations:** The authors of the abstracts selected for the poster session are invited to prepare a poster about their topic. The posters will be displayed and judged at the conference. A "Best Poster" award of \$200 will be given at the end of the poster session.

**Authorship:** Only current or recently graduated (within approximately one calendar year of May 2006) undergraduate and graduate students are eligible for this competition. Faculty advisors cannot be listed as co-authors. However, they may act in an advisory capacity.

In addition, awards for the best papers and poster will be announced in the official publication of the Ohio Section, the Ohio Section Newsletter.

**For questions or abstract submissions contact:**

**Dr. Isabel C. Escobar**  
**Chemical and Environmental**  
**Engineering Department**  
**The University of Toledo**  
**Toledo, Ohio 43606-3390**

**Telephone: 419-530-8267**  
**Fax: 419-530-8086**  
**Email: [isabel.escobar@utoledo.edu](mailto:isabel.escobar@utoledo.edu)**



# Ohio Section American Water Works Association

## 2007 Student Paper Competition Application

Name \_\_\_\_\_ Date \_\_\_\_\_

Address \_\_\_\_\_

Email \_\_\_\_\_

Phone \_\_\_\_\_

School \_\_\_\_\_

Abstract Title \_\_\_\_\_

Abstract submitted for (check one):  **Oral presentation**       **Poster presentation**

If you are not selected for an oral presentation, would you be willing to present your work in a poster session (check one):  **yes**       **no**

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### Instructions:

1. Abstract should be 500 to 1,000 words in length and double-spaced. Pages must be numbered.
2. Two pages of figures and/or tables can be appended to abstract.
3. Abstracts may be submitted by regular mail or by e-mail. The abstract title page should include the title and whether you prefer an oral or poster presentation. All information that identifies you personally (including your name, address, phone number, e-mail, school name, etc.) should be omitted from the title page of the abstract and sent on a separate page. This assures that an unbiased decision, in regard to the winning abstracts, will be made by the judges who review your abstract.

Abstracts should be submitted by e-mail, and must be in Microsoft Word or PDF format.

4. Abstracts must be received by **July 31, 2007** to be considered.

Send abstracts to: **Dr. Isabel C. Escobar**  
**Chemical and Environmental Engineering Department**  
**The University of Toledo**  
**Toledo, Ohio 43606-3390**

**Telephone: 419-530-8267**  
**Fax: 419-530-8086**  
**Email: isabel.escobar@utoledo.edu**



# 2007 DARCE Fund

## Diversity Award Reinforcing Continuing Education

### Purpose:

To include and promote people of diverse background and professions within the Water Industry. Education in the Water Industry gives opportunity to all who desire to expand their knowledge. By educating our workforce, we take the quality of our service to a new level. The use of this Fund can be used as a catalyst that encourages career growth.

### Applicant Eligibility:

Must be currently employed in the Drinking Water Industry. Need not be a member of AWWA to apply. Women and Minorities are encouraged to apply. Previous winners of the DARCE Fund are ineligible.

### Awards & Limitation:

A maximum of five vouchers may be awarded annually:

**1-\$500.00**

**1-\$400.00**

**1-\$300.00**

**1-\$200.00**

*(All awards are non-transferable.*

*Limited to 1 voucher per person per year)*

### Training Eligibility:

Vouchers are to be used for registration only for AWWA sponsored training. Examples: Ohio AWWA MEMBERSHIP, Registration for AWWA Customer Service Workshops, Safety Committee Seminars, State or National Conferences, Teleconferences, District Meetings, AWWA Study Review Sessions for Ohio certifications, OTCO Workshops, Seminars, and Courses. All other expenses to be paid for by recipients (travel, meals, etc.). Vouchers can also be used to obtain OEPA Certification in Distribution and Plant Operation.

### Requirements:

Must be nominated by an AWWA Ohio Section member. Must complete the 2007 DARCE Fund Application Form. Final applicants must be willing to meet with representatives of the DARCE Fund to discuss personal career objectives.

An education isn't how much you have committed to memory, or even how much you know. It's being able to differentiate between what you know and what you don't.

### Application Deadline:

All applications must be postmarked no later than June 22, 2007

### Award Deadline:

Award recipients will be notified no later than September 7, 2007.

Awards will be presented at the AWWA Ohio Section 69th Annual State Conference in Cincinnati, Ohio. A one-day Conference Registration will be provided for acceptance of the award.

Please return application to:

**Ohio Section, AWWA  
Diversity Committee Darce Fund  
Attn: Rashawn Truss  
3972 Indianola, Avenue  
Columbus, Ohio 43214**

**614-265-3180 Phone**

**614-268-3244 Fax**

“Water means Life for all people”

# 2007 DARCE Fund Application Form

**Please PRINT or TYPE the following information:**

Name: \_\_\_\_\_  
First Middle Last

Job Title/Classification: \_\_\_\_\_

Current Employer: \_\_\_\_\_

Years in Current Position \_\_\_\_\_ Years in Water Industry \_\_\_\_\_

Business Address: City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Daytime Phone: ( \_\_\_\_\_ ) \_\_\_\_\_ - \_\_\_\_\_ Evening Phone: ( \_\_\_\_\_ ) \_\_\_\_\_ - \_\_\_\_\_

Name of Immediate Supervisor: \_\_\_\_\_

Daytime Telephone of Supervisor: ( \_\_\_\_\_ ) \_\_\_\_\_ - \_\_\_\_\_

AWWA Member Endorsee Signature: \_\_\_\_\_

Endorsee Member # \_\_\_\_\_ Daytime Phone: ( \_\_\_\_\_ ) \_\_\_\_\_ - \_\_\_\_\_

In fifty words or less, please complete the following (must be printed or typed):

The DARCE Fund is important to me because:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**No Attachments Please • Application Deadline: June 22, 2007**

\_\_\_\_\_  
 Signature of Applicant Date

Please Return Application to: **Ohio Section AWWA  
 Diversity Committee DARCE Fund  
 Attn: Rashawn Truss  
 3972 Indianola Avenue  
 Columbus, Ohio 43214  
 614-265-3180**

*(Note: Applications must be mailed individually. Facsimilies or emails will not be accepted. )*



# Arsenic Treatment Evaluation for Small Water Systems

by: Mark Chiovarelli, Project Engineer, R.D. Zande & Associates

This article is presented to provide a general overview of possible treatment strategies for groundwater systems in meeting the revised arsenic standard implemented in January 2006. As each public water system is dissimilar, one should contact their representative at the local district office of the Ohio EPA for more specific guidelines, recommendations, and requirements.

## BACKGROUND:

If your public water system is considered a community or non-transient non-community system, you have probably evaluated the extent of arsenic in your groundwater source due to the new maximum contaminant level (MCL) of 10 parts per billion (ppb). If you are fortunate to have never had a demonstrated total arsenic level above 10 ppb, you should be grateful. For those systems that have had one or more arsenic sampling records of greater than 10 ppb, you are most likely aware of the new MCL and what it may entail. The following discussion may assist those public water systems that may not be in compliance with the revised standard or, for whatever reason, have not yet evaluated mitigation strategies.

In short-order, all applicable water systems falling under the umbrella of Ohio EPA's "arsenic watch" have to perform quarterly monitoring of the finished water for total arsenic. The USEPA has determined that exposure to low levels of arsenic for long periods can add to a person's risk of developing various forms of cancer. Because of this chronic nature, the prescribed testing must demonstrate an average annual value of 10 ppb or less for compliance. This averaging method provides the water system some flexibility in achieving the arsenic MCL. Total arsenic is comprised of two types based on the valence state, arsenic (III) and arsenic (V). Arsenic (V) is less soluble and therefore more easily removed through physical methods, whereas arsenic (III) is more soluble and requires pre-oxidation to remove.

## ARSENIC MITIGATION STRATEGIES:

The following mitigation strategies offer varying advantages and disadvantages.

- **Source Abandonment** – Abandon the existing water source and either develop a new, better quality source or purchase water from a neighboring community. Some considerations include; source development can be costly compared to treatment alternative; availability of public water system and associated costs; no guarantee of securing a better quality source; and land availability for well development.
- **Blending** – Blend the raw water from two or more sources prior to reaching the distribution system to produce a finished water with an arsenic concentration below the MCL. This strategy requires that one or more of the sources have an arsenic level below the MCL such that the blending achieves a 10 ppb or lower arsenic concentration. Limitations exist for blending as the ratio of arsenic to the MCL of the source water increases. Higher ratios require a larger supply of raw water with arsenic levels significantly lower than the MCL.

Several considerations for blending include: additional low arsenic source availability; new source development can be costly if additional onsite source is not available; requires hydraulic modifications to accomplish (may require existing well pump modifications); and requires available land for well development. At the onset of 2006, the Ohio EPA required at least three (3) wells to be provided, two of which must have arsenic levels well below the MCL in order for blending to be viable.

- **Side-stream Treatment** – Treat a portion of the high arsenic water stream and then blend it back in to the untreated portion of the stream to obtain a finished water with an arsenic concentration below the MCL. This option is similar to blending without the need of an additional water

source. The primary limitation for this strategy is the source water arsenic to MCL ratio. As ratios increase, a larger portion of the flow needs to be treated to the point where the entire flow may need to be treated. Based on discussions with the Ohio EPA in late 2005, side-stream treatment would not be allowed.

- **Full-stream Treatment** – Treat the entire flow from the high arsenic water source to obtain finished water with an arsenic concentration below the MCL. This mitigation alternative is the most practicable when the arsenic levels are substantially higher than the MCL. Treatment can be implemented at the wellhead, at a centralized location, or at the point-of-use. Treatment options are divided into sorption processes, membrane processes, and precipitative processes. Sorption processes include ion exchange (IX-anion resin), activated alumina,

and iron based sorbents. All but IX offer point-of-use (POU) systems as well as centralized “point-of-entry” (POE) systems; IX are centralized systems. POU systems are installed locally at the point of ingestion. The membrane process (reverse osmosis (RO)) can be centralized or POU. Precipitative processes include enhanced lime softening, enhanced coagulation/filtration, coagulation-assisted microfiltration, coagulation-assisted direct filtration, and oxidation-filtration. These processes are centralized treatment options that produce a residual waste sludge.

Considerations for treatment include; higher capital costs; higher operation & maintenance cost; will most likely require existing system modifications (well pump change, piping, etc.); may require additional building space; additional waste disposal must be provided; and potential pilot testing.

**Table 1 – Arsenic Treatment Options (1)**

Treatment Parameter	Option No. 1	Option No. 2	Option No. 3	Option No. 4
<b>Process</b>	Ion Exchange	RO (Membrane)	Iron-based Sorbents	Oxidation-Filtration
<b>Type</b>	POE	POE or POU	POE or POU	POE
<b>Removal Efficiency</b>	95%	>95%	Up to 98%	50-90% <sup>(2)</sup>
<b>Optimal Raw Water Quality</b>	pH 6.5-9.0 <5 mg/L NO <sub>3</sub> <sup>-</sup> <50 mg/L SO <sub>4</sub> <sup>2-</sup> <500 mg/L TDS <0.3 NTU Turbidity	No Particulates	pH 6.5-9.0 <1 mg/L PO <sub>4</sub> <sup>3-</sup> <0.3 NTU Turbidity	pH 5.5-8.5 >0.3 mg/L Fe Fe:As Ratio > 20:1
<b>Pre-Oxidation Required</b>	Yes for Arsenic (III)	Likely for Arsenic (III)	Yes for Arsenic (III) on some systems	Yes for Arsenic (III)
<b>Operator Skill Level</b>	High	Medium	Low	Medium
<b>Waste Generated</b>	Spent Resin & Brine, Backwash Water	Reject Water	Spent Media, Backwash Water	Backwash Water, Sludge
<b>POE/POU Cost</b>	Medium/Not Applicable	High/Medium	Medium/Medium	Medium/Not Applicable
<b>Pilot Testing Required</b>	Yes	Yes	Yes	No
<b>Other Considerations</b>	<ul style="list-style-type: none"> <li>• Possible pre &amp; post pH adjustment.</li> <li>• Pre-filtration required.</li> <li>• Potentially hazardous brine waste.</li> </ul>	<ul style="list-style-type: none"> <li>• High water loss (15-75% of feed water).</li> </ul>	<ul style="list-style-type: none"> <li>• Media may be very expensive.</li> <li>• Pre-filtration may be required.</li> </ul>	<ul style="list-style-type: none"> <li>• None.</li> </ul>

Notes: 1. Source, USEPA Arsenic Treatment Technology Evaluation Handbook for Small Systems. 2. Depends on the arsenic and iron concentrations.

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Table 1 identifies several treatment options that may be most applicable and would best meet the goals of a small water system. Each of the options is discussed following the table along with a summary of pilot testing protocol.

### **Ion Exchange**

Ion exchange units are categorized as either cation or anion depending on the “chemical” that is to be removed. Cation resin units remove higher valence positive (+) ions and replace them with a lower valence less harmful or more aesthetically pleasing (+) ions such as sodium ( $\text{Na}^+$ ). Likewise, anion resin units remove higher valence negative (-) ions and replace them with a lower valence less harmful or more aesthetically pleasing (-) ions such as hydroxide ( $\text{OH}^-$ ) or chloride ( $\text{Cl}^-$ ).

As standard ion exchange can only remove arsenic (V),  $\text{As}^{+5}$ , a pre-oxidant is required to remove arsenic (III),  $\text{As}^{+3}$ . Therefore, it is important to know which species of arsenic is dominant in the water source. Typical oxidants include potassium permanganate and chlorine, both of which offer a certain degree of complexity and operations and maintenance

issues. Potassium permanganate is the most common since it does not have the safety concerns as those associated with chlorine. Nonetheless, the use of oxidants creates additional process-related responsibilities and costs.

Although point-of-use devices are not available for ion exchange, an anion exchange unit could be installed into an existing system to preferentially remove arsenic. The additional ion exchange unit would yield additional wastes in the form of spent resin & brine, and backwash water.

### **Membranes**

Membrane technology is a treatment process that uses a physical barrier to separate hardness ions, dissolved organics, total dissolved solids, and other constituents from the raw water. The membrane barrier separates the water into two streams: (1) permeate that has passed through the membrane and contains less dissolved solids than the raw water, and (2) concentrate that has been

rejected by the membrane and contains more dissolved solids than the raw water.

Membranes offer complete removal of raw water constituents based on the membrane pore size. Smaller pore sizes reject more constituents than larger pore sizes. Membrane systems typically generate a large quantity of reject wastewater and therefore must be designed accordingly to produce the required water flow. Means for disposal of the large volume of wastewater must be provided as well. Although the cost of membranes has historically been higher than other more traditional technologies, the prices are becoming more competitive as the technology has improved and the numbers of installations continue to increase. Membrane units can be purchased for point-of-use or point-of-entry applications.

Point-of-use (POU) devices offer the ability to treat only the water that has the potential to be ingested whereas centralized units would treat the entire well flow. For instance, POU devices could be installed on drinking fountains, icemakers, and faucets used for cooking purposes only. POU membrane units are typically installed below the sink and supplied with a bladder tank and separate tap to allow continued use of the existing tap for general uses. As shown in Table 1, pre-oxidation for arsenic (III) removal is likely and therefore would require a chemical feed system. However, this may be impractical with point-of-use treatment since a two (2) minute contact time (minimum) is required and numerous locations would have to be covered. POU treatment is not without its drawbacks though. Performance testing is required prior to full-scale implementation. Every tap used for ingestion purposes must be covered and equipped with an alarm or shutoff device. Additionally, every unit must be monitored for compliance determination and a maintenance schedule submitted on a regular basis.

### **Oxidation-Filtration**

Oxidation-Filtration is a fairly simple process that has been used extensively for iron removal in groundwater treatment for many years. In plain terms, raw water is aerated at a nominal 30-minute contact time to trigger the dissolved iron to precipitate out as iron oxides where they are removed through the filtration process. Arsenic (V) coprecipitates with the iron oxides and is therefore removed in the filter with the iron. The effec-



*Typical Point-Of-Use Device*

tiveness of this process is dependent on the iron to arsenic ratio in the raw water. It is the most effective if iron:arsenic  $\geq 20:1$ . If manganese or arsenic (III) is to be removed, chemical oxidation is required as discussed for the previous

technologies. In addition, manganese requires a special media type known as greensand.

This type of treatment unit is typically supplied as a single integral unit comprised of an aerator fan, detention tank, and filter. Additionally, they are offered in either a gravity-feed mode or pressure-feed mode. For the gravity-feed unit, the raw water is pumped from the well to the top of the unit where it flows by gravity through the detention chamber and filter. The addition of an intermediate pump may be required to transfer the water through the existing treatment train and maintain the existing water system pressure. A pressure-feed unit enables the use of the well pump to “push” the water through the filter and the existing treatment system, provided the existing pumps can manage the added headlosses.

### **Iron-Based Adsorptive Media**

A process similar to ion exchange but fairly new to the market is iron-based adsorptive media. The media is comprised largely of a ferric base to remove arsenic and other heavy metals from raw water. Unlike ion exchange, iron-based media is not an ion replacement process. The media simply adsorbs the metal on its surface area without releasing any other constituent back into the water. Many systems do not require a backwash cycle thus eliminating backwash water waste. The spent media is disposed of and replaced with new media or regenerated following a sufficient run time interval. Regeneration can be accomplished on-site or off-site by a regeneration company. On-site regeneration involves operator expertise and additional chemical feed systems. Off-site regeneration can be costly and requires replacement media for the vessels during the regeneration period. Media run times vary per manufacturer but can range from three months up to 21 or more months between media change out.

This system can be installed in series within existing treatment systems. Since it is a pressure vessel system, additional pumping may be required.

## **TREATMENT SELECTION CONSIDERATIONS:**

### **Pilot Testing Protocol (Demonstration Study)**

The OEPA has developed guidelines for obtaining approval of arsenic removal systems. Of the four technologies mentioned, oxidation-filtration treatment is the only process that does not require pilot testing. All other technologies require a pilot test program to prove their effectiveness at removing arsenic from the raw water at each source. Since the newer technologies have not had a sufficient proven track record in OEPA's eyes, their basis is that varying water quality can affect the performance of a given system and therefore each system will be different. The purpose of the Demonstration Study is to assess the performance and suitability of the proposed treatment option to; determine operating parameters; assess any interference from other constituents in the water; and determine the necessary regeneration frequency and procedures.

The required pilot test duration is 480 hours at the design flow rate with all other treatment components in service. All water processed through the pilot unit must be sent to waste. Bear in mind that the pilot unit would be a scaled down version of a typical unit and therefore waste quantities should not be significant.

A Demonstration Protocol Plan would need to be developed for anion exchange and adsorptive media centralized units and submitted to OEPA for approval. The purpose of the plan is to formalize methodologies of procedures and testing requirements. Testing parameters have been formulated by OEPA for both of the technologies and include an extensive list of water quality parameters.

The approval of a point-of-use (POU) device is not as arduous as that of centralized systems. All POU devices must first be certified according to the American National Standards Institute (ANSI) standards. Devices must be tested against the corresponding ANSI/NSF (National Sanitation Foundation) standards by an ANSI accredited laboratory. Piloting of a single tap is recommended before choosing a POU strategy for compliance with the arsenic MCL. Piloting a single tap affords the water system some certainty that the device will adequately remove arsenic before purchasing the required number of units.

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**Monitoring & Maintenance Considerations**

Point-of-Entry or centralized treatment systems offer the advantage of a single point of monitoring and maintenance unlike point-of-use devices. Monitoring of POU devices requires that 25% of the total number of units be sampled quarterly on a rotating basis. For instance, one set of 25 devices out of a hypothetical 100 devices would be sampled one quarter and then a different set of 25 would be sampled the next quarter, etc. Centralized systems can be monitored on a regular basis from a single effluent sample tap. Additionally, a maintenance/inspection schedule should be developed and implemented to coordinate cartridge or media change out for each POU unit.

With their remote location and accessibility, POU units can have a tendency towards damage and misuse causing unnecessary repairs or possible replacement. A centralize system would be retrofitted into the existing water treatment system with limited access to personnel only.

**Additional Considerations**

Further considerations in the selection process include optimal raw water quality, waste generation, and "Other Considerations" as listed in Table 1. The ion exchange process has the most expansive raw water quality criteria list of the four options shown in Table 1, whereas membranes have the least extensive. Membranes however can be fouled by particulates and thus usually require pre-filtration. Of the four options presented, oxidation-filtration provides a reasonable water quality criterion that can be met with the existing water at both facilities tested.

Each option will generate some quantity of waste. Iron-based sorbents would likely require disposal of the spent media only if off-site regeneration is implemented. Of the "Other Considerations" (Table 1), oxidation-filtration offers the clear-cut advantage over the other alternatives. Filter media is backwashed on a regular basis so media replacement is not a concern and there is no concern for pre-filtration, pH adjustment, or high water loss.

**About the Author**

Mark Chiovarrelli is a licensed Professional Engineer in the State of Ohio with a Master's Degree in Environmental Engineering from the University of Central Florida. He is a Senior Project Engineer in the Water/Wastewater Group of R.D. Zande & Associates, INC. Columbus office.

**Welcome New Members**

<b>Member - Hometown</b>	<b>Endorsed By</b>
<b>October</b>	
Garry Myers - Ludlow Falls	Lorrie Brown
James Sims - Midvale	
Michael O'Malley - Cleveland	Melinda Raimann
Gina Routen - Cleveland	Melinda Raimann
Todd Wilson - Kingston	
Alireza Fathi - Cincinnati	
Monica Powell - Columbus	
Regina Edwards - Warren	
Franco Lucarelli - Warren	Bob Davis
Brian Mavromatis - Wintersville	
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Veronica Pope - Cleveland	
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David Thomas - Bridgeport	
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Douglas Kester - Huron	
Steven Cover - Port Clinton	
Qiuli Lu - Columbus	Denise Nelson
Daniel Malz - Cleveland	Charles Smith, Jr.
Miriam Siegfried - Columbus	
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