Collins Park WTP HAB Short Term Solutions and Beyond - Taming the Creature(s) from the Blue Green Lagoon

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THE PROBLEM

After the historic “do not drink” advisory issued on August 2, 2014, the City of Toledo immediately began to seek additional treatment measures for harmful algal bloom (HAB) removal that could be implemented by the 2015 algal season.

The Challenges

With only approximately 9 months available for design & implementation, HAB short term improvements had to be identified and fully operational by July 2015.

Alternatives Screening - There were several alternatives initially considered for additional treatment barriers for HAB events which included:

- Increased feed capacity of potassium permanganate at the Intake Crib/Low Service Pumping Station (LSPS)
- Increased feed capacity of powdered activated carbon (PAC) at the LSPS
- PAC post sedimentation at the East & West Plants
- DAF (dissolved air flotation)
- ozone post-sedimentation
- post filtration GAC contactors
- UV Advanced Oxidation Process (AOP)

Due to the urgency of being able to implement treatment technologies by the 2015 algal season, the HAB Short Term Measures projects were identified from these potential alternatives. Having a full understanding of the treatment processes, unique arrangement of the infrastructure and operational characteristics of the Collins Park WTP facilities was paramount in making the selections among these projects. A process flow schematic of the Collins Park WTP is shown on page 6.

continued on page 6
Tideflex® Mixing System Improves Water Quality and the Environment In One Step

The Tideflex® Mixing System (TMS) is extensively CFD modeled, scale modeled and field validated to improve storage tank water quality by eliminating short circuiting and achieving complete mixing. The TMS is a green technology that does not require an outside energy source or maintenance, resulting in major cost savings over a minimum 30-year life. For every tank and reservoir, Tideflex® Engineers select the optimum TMS configuration and provide a mixing and water age analysis to confirm complete mixing based on volume turnover.
Hello! I hope each and every one of you has enjoyed this beautiful winter weather we have had in Ohio. It is hard to believe that my term as chair is half way completed. It has definitely proven to be an exciting and busy year.

I had the pleasure of attending the fall meetings in each of the sections. It was great to cross paths with contacts from my past and to meet several new individuals as well. Thank you to each of the Districts for welcoming me and allowing me just a few moments to introduce myself and bring the attendees up to speed on a few exciting items the Section is embarking on this year.

Back in November we held a strategic planning session. As a Section, we have not held one of these since 1999. AOM, our professional services provider facilitated this workshop for us as we worked through discussions on how our Section looked, looks and could look in the future. This session was extremely informative and offered some great suggestions for us to consider moving forward. As we all know, times are changing, technology is changing, membership make up and needs are changing as are our volunteer interests. Additional information about how we plan to implement these results will be an ongoing topic as the year progresses.

We have signed another Memorandum of Understanding (MOU) with Ohio Water Environment Association (OWEA). Yes… we will be holding another Joint One Water Conference. We are looking to hold this during the summer of 2018 in Columbus. We have a team in place to locate and lock in a hotel and conference room space for this event. We are all hoping for another successful event like we had in 2014. We are also holding conversations on others ways to perhaps join forces in some of our training sessions and committee efforts, such as through the newly formed Asset Management Committee which is comprised of members from both organizations.

Cliff Shrive, Jeff Swertfeger and the rest of the Local Arrangements Committee are working together to plan our 78th Annual Conference to be held September 13 – 16, 2016 in Cincinnati at the Duke Energy Convention Center Hilton Netherlands Plaza. This year’s theme is Vote Water. As is always the case, I know this team along with the Technical Program Committee will put together an event worth attending.

Steve Heimlich, the Education Committee and AOM are helping us put together both an Area 1 and Area 2 training to be held in Ohio this year. For the Area 1 training, the Association and our Section have signed an agreement with RCAP to develop and deliver small systems training as part of a $4M grant funding from USEPA. For the Area 2 training, the Association and our Section have signed an agreement with Environmental Finance Center (EFCN) to develop and deliver training and technical assistance for small drinking water systems in the area of financial and managerial capacity as part of a $1.8M in grant funding from USEPA. With additional revenue from avenues such as these training sessions, we are continuously finding ways to give back to our members and perhaps future members. A few examples of this include additional funding to our competitions committee to help send our teams and judges to ACE, increased prizes for our scholarship winners as well as the additional money we are contributing to science fair competitions.

The WUC has been very busy recently with discussions circulating around lead recent issues Thank you to Mike Baker and Ohio EPA for agreeing to sit down with us and bounce some of your ideas off of our attendees and listen to some of our questions and concerns. We are very fortunate in Ohio to have such a wonderful working relationship with the Agency and we only hope this is able to continue in the years to come.

We are continuing to send you our weekly updates of events going on in our Section as well as links to relevant news articles in print over the last week or so. These emails are delivered to you from the email address: American Water Works Association Ohio Section with the subject H2O in the Know – (Month) (Date), (Year) issue. If any of the Districts or Committees has information they would like to include in these eblasts, but contact AOM and we can work with you to pass this along to our members.

We have a busy Spring ahead for our volunteers and members with both the Southern Expo and Northern Expo, each of the District’s Spring meetings, the Washington Fly-In as well as Region III Meeting of Section Officers in Fargo, ND. I’d like to thank each of you for your efforts in helping to support each of these events. As is always the case, we are always looking for volunteers to get involved and help with each of these events. If you are interested in volunteering and just need a little help finding the best place to do, don’t hesitate to contact myself or any of the other members of the governing board. We’d love to have your help in shaping the future of this Section.

I’m looking forward to working with you in the second half of my term as Chair.
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Welcome to 2016! From the very beginning months of this year, AWWA has continued to move forward on all the current initiatives and programs. I am continually amazed at the varied activities that are being undertaken on the Association level.

- Small Systems Training; grant award through USEPA
- Community Engineers Corps
- Total Water Solutions
- AWWA India
- Value of Water Coalition
- AWWA2020
- Membership Structure Update
- The Water Equation

Progress is being made on several levels, but there is still a lot of work to do before success has been declared. Keep asking questions, volunteering your time, and help AWWA realize our Vision – A better world through better water.

Some quick updates on a few of the activities…as mentioned in a previous Report, AWWA will be modifying the membership structure. The 21st Century Membership Model seeks to reduce confusion, provide the potential for an increase in members, increase-operational and Section effectiveness, and facilitate opportunities for member engagement. One of the first steps that will be undertaken is the elimination of the Plus+ Points Program. A new package of benefits will be substituted for our Utility and Service Provider Organizations, which will maximize the current offerings while removing the confusing membership language.

Another item that was recently discussed during the Board of Director’s Meeting is AWWA’s Philanthropic and Charity Designation. Following the direction of the current Strategic Plan which was adopted in 2013, the Association developed an AWWA philanthropic initiative. In late 2014 The Water Equation was launched, and focuses on workforce advancement, as well as community and global outreach fundraising efforts. The culmination of several discussions by the Board resulted in the following statement:

**AWWA will focus philanthropic efforts on The Water Equation and continue to support Water For People**

What does this mean to the Ohio Section, its members, and Water for People? It means that you as a member will have the opportunity to support not one, but two wonderful programs. Each is deserving of your time and financial donations, and you will have to choose the right balance for you personally. But it also means what is stated; that AWWA as an organization will be focusing on our own philanthropic program, The Water Equation.

ACE2016 – What’s New. Jim Cantore, on-camera meteorologist for The Weather Channel will be the Keynote Speaker during the Opening General Session. Jay Mohr will be keynote speaker of the Water Industry Luncheon. You are encouraged to attend both sessions, although there is a fee for the luncheon. Additional items that will be new to ACE this year in Chicago:

- Unlimited Free Exhibits Only registration for Water and Waste Water Utilities who pre-register.
- New Waste Water sessions to be held in the exhibit hall.

In closing, I’d like to once again say Thank You to the members of the Ohio Section. I am proud to be Your representative on the AWWA Board of Directors. And if you have suggestions about the Ohio Section, or questions about the activities of the Association, please do not hesitate to contact me at cliff.shrive@stantec.com or 513.824.6744

Cliff Shrive, Ohio Section Director

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The Collins Park WTP consists of two identical parallel plants that includes the West Plant (80 MGD) and East Plant (40 MGD) for a total capacity of 120 MGD. The short term projects selected include:

- LSPS Potassium Permanganate System Improvements
- LSPS PAC Feed Improvements
- East & West Plant PAC Feed Improvements

It was determined the other alternatives of DAF (dissolved air flotation), ozone raw water or post-sedimentation, post-filtration GAC contactors and UV AOP were too large and complex to design and construct in this short term period. These technologies were considered to be longer term treatment alternatives that were evaluated in the General Plan as additional treatment barriers to be implemented at a later date.

Two of the alternatives were eliminated in the initial screening, DAF and UV AOP. Although DAF is an excellent process to remove unlysed algal cells there were many site specific disadvantages that included available space limitations at the LSPS (that is surrounded by Cedar Point National Wildlife Refuge), LSPS site waste stream disposal and treatment (City of Oregon wastewater system ~6 miles away), and the inability to treat lysed dissolved microcystin in the water. For UV AOP with hydrogen peroxide to be effective against harmful algal bloom toxins, the amount of UV and power requirements would be greater than UV levels used in normal water treatment. This increased sizing along with the need to re-pump the treated flow did not make this alternative attractive for further evaluation.

**MEETING USEPA HEALTH ADVISORY LEVELS**

To the right in Table 1 are interim USEPA health advisory levels for microcystin and cylindrospermopsin that have been issued until more research can be conducted and final regulations developed. Both of these toxins called cyanotoxins are from different forms of cyanobacteria also called blue-green algae. For freshwater bodies in this region microcystin is the predominant toxin with cylindrospermopsin being predominant in tropical or subtropical regions and generally not present in enough concentration in this region to be a concern.
Table 1: Cyanotoxin Health Guidelines

MAY 6, 2015 USEPA Issued Health Advisory Levels:

- Younger than School Age Children:
  - Microcystin > 0.3 ug/L
  - Cylindrospermopsin > 0.7 ug/L
- General Public
  - Microcystin > 1.6 ug/L
  - Cylindrospermopsin > 3.0 ug/L
- 10-day continuous exposure

THE SHORT TERM SOLUTIONS

Detailed design commenced in the Fall of 2014 in conjunction with bench scale testing of the efficacy of microcystin removal rates for the PAC feed at the LSPS and East and West Plants.

RAW WATER CHARACTERISTICS

During the summer of 2014, the City performed extensive intracellular and extracellular microcystin testing at the intake, surge well, raw water at the WTP, post sedimentation, filtered, clearwell, and plant finished water. Intracellular is all of the microcystin contained within the bacteria cell walls. Extracellular microcystin is the level of microcystin that has been released by a dead cell that has burst open and released its toxins (also called lysing). To provide some background data on the microcystin concentration results, the following three figures have been developed:

- Figure 1 Microcystin Lysed 0 – 50 ppb, August 8 – 23, 2014,
- Figure 2 Microcystin Lysed 0 – 10 ppb, August 8 – 23, 2014,
- Figure 3 Microcystin Extracellular, August 15 – 23, 2014,

The data in these figures was used as a trending tool over time, as the samples were not directly sequenced with the water as it flows through the plant processes. Figures 1 and 2 show the total microcystin in the samples by lysing all algal cells and releasing the microcystin; Figure 1 shows a full range of 0 – 50 ppb (µg/L) and Figure 2 provides an expanded scale to show greater detail of the lower microcystin levels within the plant treatment process.

When lake water and weather conditions become favorable for HAB growth, the toxic algae can reproduce very quickly. Figure 1 shows this as microcystin levels in the raw water at the intake sample spiked to 50 µg/L in mid-August.

Figure 1: Microcystin Lysed 0 – 50 ppb, August 8 – 23, 2014
Figure 2: Microcystin Lysed 0 – 10 ppb, August 8 – 23, 2014

Figure 3: Microcystin Extracellular, August 15 – 23, 2014

Figure 3 shows the extracellular microcystin in the water when filtered first to remove unlysed cells from the sample before testing for microcystin levels. Of special note, on August 16 and 17 when comparing levels between the intake and the surge well, the data is indicative that some lysing occurred after feeding potassium permanganate for quagga and zebra mussel control at the intake.
A TALE OF TWO WATERS
(DEC 2014 & AUG 2015)

To develop a basis for design for short term improvements, PAC jar testing for removal efficacy of microcystin was performed to simulate varying PAC feed rates at the LSPS and Collins Park WTP. With time not on our side, microcystin jar testing was first performed with December 2014 raw water (typically the best raw water quality of the year). Basis of design assumptions had to be made with subsequent jar testing performed in August 2015 to further verify the expected performance of the improvements.

LSPS PAC JAR TESTING RESULTS

PAC jar testing on removal efficacy of microcystin was performed to simulate the approximately 5 hour contact time that occurs through 9 miles of raw water main between the LSPS and the Collins Park WTP. Having this 5 hours of contact time is very unique and maximizes the time PAC may absorb extracellular microcystin in the raw water. The City currently uses MeadWestvaco NUCHAR SA, which is what was used for the jar testing. Figure 4 shows microcystin removal rates based on PAC feed rates 0, 5, 15, 25, 35 and 45 mg/L. At the far left with 0 mg/L PAC added is the control and shows the various spiked microcystin levels in the raw water samples. As PAC feed rates are increased, the levels of extracellular microcystin decreases.

The data validates that PAC is successful in removing large quantities of extracellular microcystin in the water. Of special note, the water that was tested was collected in December and is of higher quality than would be generally experienced when higher TOC levels and algae are present. Consequently, removal efficacy was expected to be less under typical water conditions, as such the removal rates would be expected to shift some to the right on Figure 4.

Subsequently, jar testing was performed in August 2015 and is shown in Figure 5. As anticipated, the microcystin removal rates for the raw water samples from August and September were less than for the December 2014 sample. The August sample in particular showed significantly less removal.

Figure 4: PAC Performance: December 2014 Raw Water
For example, a PAC dose of 45 mg/L did not fully reduce the microcystin level below 0.3 ug/L (EPA Advisory Level for younger children) but did reduce the microcystin below 1.6 ug/L (EPA Advisory Level for the general public). By contrast, in December we found that only 15 mg/L of PAC was needed to reduce the microcystin level to below 0.3 ug/L, even with starting concentrations as high as 42.2 ug/L. This indicates that the background organic matter present in the August sample, and to a lesser degree, the September sample, inhibited microcystin uptake (via competitive adsorption) to a greater extent than the organic matter present in the December sample. More organic matter in the samples or differences in the character of the organic matter in these samples could contribute to the inhibited microcystin uptake (as compared to the December 2015 testing). TOC data for the December 2014 sample was approximately 3.6 mg/L while TOC was 7 mg/L and 1.9 mg/L for the August and September 2015 samples. Although these are respectable removal rates, there is still need for additional removal rates and process treatment improvements to fully reduce microcystin to below all EPA Advisory Levels.

Figure 5: PAC Performance: August 2015 Raw Water

COLLINS PARK WTP JAR TESTING RESULTS

Initially, PAC jar testing on removal efficacy of microcystin was performed to simulate the approximately 7 – 15 minutes of contact time that occurs in the settled water conduit between the recarbonation basins and filters. Figure 6 shows microcystin removal rates based PAC feed rates 0, 1, 2, 3, 4 and 5 mg/L using the City’s wood based PAC.

As shown in Figure 6, the PAC addition had little impact on reducing the microcystin level with the contact time provided in the settled water conduit. Subsequently, PAC jar testing on removal efficacy of microcystin was performed to simulate a 1.5 hour contact time to observe performance should PAC be applied ahead of the sedimentation basins. Figure 7 shows microcystin removal rates based PAC feed rates 0, 1, 2, 3, 4 and 5 mg/L using the City’s wood based PAC.
This data indicates that with the extended PAC contact time microcystin removal rates significantly increase. It should be noted that lignite based PAC was also tested, but did not perform as well as the wood based PAC. With these favorable results, testing proceeded to simulate adding 6 mg/L of PAC at the beginning of the 3rd pass of the flocculation tanks. The 3rd pass of the flocculation tanks was selected to minimize PAC particles reacting with the floc particles (thus after formation of floc has occurred and charged particles have been expended). Figure 8 shows microcystin spiked at 1 ug/L with removal rates based on the City wood based PAC feed rate of 6 mg/L and different levels of alum and lime feed rates at 30 minutes, 1.5 hours and 3 hours detention times.

Figure 8 also shows a significant reduction in microcystin in the range of 60 – 80% removal efficacy. While performing this testing, concern was expressed...
about how much of the PAC would be removed by the floc in suspension in the 3rd pass. Therefore, 1 L of the jar test was filtered to identify how much PAC remained after the 3rd pass flocculation and 1.5 hour contact time. Figure 9 shows the filtering results that indicates a significant amount of the PAC remains in suspension and available for further microcystin treatment in the sedimentation basins.

To see how complete microcystin removal would be at an elevated concentration of 10 µg/L, additional jar testing was performed and is shown in Figure 10. At this elevated concentration, microcystin removal rates of 55 – 65% are observed after 3 hours of sedimentation time.

Interestingly, in Jar Test 2 the conventional alum lime treatment process does not appear to remove any dissolved microcystin from the water.

Figure 9: PAC Remaining in Suspension: 3rd Pass Flocculation After 1.5 Hours Settling

Figure 10: PAC Performance, 3rd Pass Flocculation, Microcystin Test 10 µg/L
FILTER DEMONSTRATION STUDY

Excessive PAC immediately upstream of filters can cause decreased filter performance and a potential increase in effluent turbidity that may be of concern in meeting turbidity regulations.

Consequently, the City also performed a filter demonstration study and testing to observe the performance of a filter when PAC is introduced and present in the settled water. With the very aggressive schedule, a filter performance demonstration study was performed in the winter of 2014 – 2015 and subsequently during HAB season in August 2015.

Based on standard operations manual of practice the upper limit of PAC concentrations a filter can handle is approximately 6 mg/l. The data collected in the winter indicated the filters would be capable of filtering out up to 6 mg/l of the very fine PAC particles. However, because there was some undesirable increased break through observed, the City and OEPA desired to perform additional full scale testing in August 2015 during the HAB season.

TOC removal efficiency was also measured daily throughout the course of the trial period. The graph below shows the period of August and September 2015. There was no consistent trend with TOC removal as the PAC feed rates were varied through the course of the study, or after PAC feed rates were significantly reduced at the conclusion of the study. Removal rates observed are shown in Figure 11.

Based on the August 2015 full scale testing, the City is comfortable that the installed PAC systems at Collins Park WTP may be operated at dosages up to 6 mg/L without the risk of significant loss in filter performance or elevated risk of effluent turbidity breakthrough. Effluent turbidity was not significantly affected by the PAC dosage. TOC removal efficiency was similarly not significantly affected by PAC dosage. However, filter head loss performance was negatively affected at the higher dosages, but the increased head loss did not exceed operating thresholds and was adequately managed during the period of the study.

SHORT TERM IMPROVEMENTS

Intake Crib & Low Service Pumping Station – The chemical feed improvements design concept is to lyse the algae cells with permanganate solution in the intake pipe in Lake Erie and apply needed dosages of activated carbon at the LSPS to remove algal toxins in the raw water. More specifically, the basis of design for these improvements includes:

- **Intake Crib** - Increasing potassium permanganate current feed rate from 1 mg/l for mussel control to 6.5 mg/L to assist in the reduction of algal toxins by lysing cells while in the 3 mile intake conduit pipe.
- **Low Service Pumping Station** – Improving PAC feed capabilities by providing additional storage and increasing the current feed capacity.
  - PAC feed rates increased from 15 mg/L to 40 mg/L to allow for more complete absorption of extracellular microcystin during the 9 mile ~5 hour contact travel time to the Collins Park WTP.
  - New storage silo for 175,000 pounds of dry PAC.

*continued on page 14*
Of special note, when lysing with potassium permanganate at the raw water application point care must be taken to confirm that all treatment processes downstream are not overloaded and are able to absorb all lysed extracellular microcystin from the water. An alternative approach is to not lyse and instead, remove unlysed cells in the coagulation and sedimentation process.

Collins Park East & West Plants - Chemical feed improvements at the treatment plants consisted of:

- **East Plant** – Providing capability to feed up to 6 mg/l of PAC at 3rd pass of flocculators and installing new 45,000 pound storage silo.
- **West Plant** – Providing capability to feed up to 6 mg/l of PAC at 3rd pass of flocculators and installing new 45,000 pound storage silo.

Detailed design, bidding and construction was completed within a very aggressive 9 month period and was fully operational by July 2015 just in time for the algal season. This accomplishment was a culmination of outstanding Team efforts by the City of Toledo, ARCADIS, PMG, Mosser Construction and the Ohio EPA. Without these monumental efforts by all parties this project could not have been completed in this timeframe. Project costs and typical residential user costs are listed below in Table 2. The impact to residential rates are minimal in comparison to the added protection these short term improvements have to offer especially in light of the USEPA Advisory Level of 0.3 ug/L for younger children.

Quick to respond to the need for immediate infrastructure improvements for removal of algal toxins from drinking water, the Ohio EPA introduced funding opportunities for addressing harmful algal bloom impacts and cyanotoxin testing equipment in August, 2014. Through extensive communication and coordination efforts with the Ohio EPA, the City was able to secure Water Supply Revolving Loan Account (WSRLA) loans for the planning and construction of the short term HAB chemical feed improvements.

Generally, the PAC feed systems at the WTP are viewed as a short term treatment measure and will ultimately be replaced with a more effective long term solution.

Figure 11: PAC 3rd Pass Feed TOC Removal Rates

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Project Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction Projects</strong></td>
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</tr>
<tr>
<td>PAC Feed Equipment for HAB Chemical Feed Improvements</td>
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<tr>
<td>HAB Chemical Feed Improvements</td>
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<tr>
<td><strong>Engineering &amp; Technical Services</strong></td>
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</table>
ADDITIONAL SHORT TERM BARRIER OPTION

Increase Chlorine Dosage at Settled Water or Post-Filtration Application Points – As a final treatment barrier, should the PAC system and treatment processes not be able to achieve the necessary removal levels of microcystin with a large harmful algal bloom, the City has the capacity to significantly increase chlorine feed at the settled water and post-filtration locations. In addition, the City has 70 MG of clearwell storage that has an 18 – 24 hour contact time to allow the increased chlorine to further destroy any remaining microcystin. This option needs to be carefully balanced with the potential of increased DBP’s and THM’s.

BEYOND SHORT TERM MEASURES – OZONE SYSTEM DESIGN

During the implementation of these short term improvements there has been extensive evaluation and jar testing of using ozone at the settled water application point or GAC contactors post-filtration. Based on jar testing, ozone was shown to be more effective than PAC and GAC in microcystin destruction and in operational cost. Therefore, the City’s long term solution is to implements ozone treatment at the Collins Park East & West Plants.

PUBLIC RELATIONS PLAN

With the “do not drink” event on August 2, 2014, the City administration and public officials were very concerned about public perception moving forward. To more fully educate and inform the public when microcystin is detected in the raw water and convey treatment performance they developed the following dashboard in Figure 12 that is on the City’s Department of Public Utilities website and is distributed to local television channels and newspapers.

Figure 12: Microcystin Dashboard

The City of Toledo has improved its capabilities to treat HAB’s and microcystin in their water supply for the near term with upgrades to the potassium permanganate and PAC feed systems; until such time as the ozone treatment barrier will be constructed and operational.
FAREWELL WISHES TO DAN MCVAY

With more than 25 years in the industry, Regional Manager, Dan McVay, is retiring after 15 years of service with DN Tanks. He has been an active member of AWWA and was a deserving recipient of the Fuller, LaDue, Lechner and Water Wheel awards. We appreciate his years of dedication, support and commitment to our customers and to the industry. We wish Dan and his wife, Sharon, well as they embark on this new journey.

WELCOME STEVE APPLEGATE

As Dan leaves, we welcome a new addition to the DN Tanks family. We are pleased to introduce your new point of contact for your area, Steve Applegate. Please feel free to contact Steve regarding new and/or existing tank projects.

STEVE APPLEGATE, REGIONAL MANAGER

317.517.5771 | STEVE.APPLLEGAT@DNTANKS.COM
WWW.DNTANKS.COM
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The Great Lakes is now home to AMERICAN SpiralWeld’s newest division. That means we’re closer than ever to delivering solutions throughout the Great Lakes. Whatever the job size, in sizes up to 12 feet in diameter and thickness up to one inch, we can handle it. Built strong, built to endure, and made in America. That’s The Right Way. That’s the AMERICAN way.

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Introducing the first topic for Alloway’s Summer Webinar Series

The Impact of Harmful Algal Blooms on the Water & Wastewater Industries

Featuring Presenters - Barbara Lubberger, OEPA Division of Drinking and Ground Waters, & Andy Bachman, OEPA Division of Surface Water

Tuesday, May 24th, 2016

12:00 to 1:00 P.M.

For a complete list of topics included in our Summer Webinar Series, visit

www.alloway.com

Register online by May 23rd, 2016
Baker and Associates
Water and Waste Treatment Equipment
1284 Som Center Rd, #215
Cleveland, Ohio 44124
Phone: 440.461.4577, Fax: 440.461.0429

Ted Baker
440.829.8405
hlbaker@aol.com

Doug Borkosky
614.361.3673
doug@hlbaker.com

Tony Lococo
330.961.1087
tony@hlbaker.com

With over 30 years of experience, let us serve your analytical needs.
On behalf of the Ohio Section AWWA Governing Board and our local arrangements committee, I am pleased to officially invite you to join the Governing Board during the 78th Annual Conference, to be held at the Hilton Cincinnati Netherland Plaza Hotel in downtown Cincinnati from September 13 to 16, 2016.

Vote Water! 2016 will highlight the many ways that Water touches our lives, from the time we wake up until we go to sleep each night. This year’s local arrangements committee, with volunteers from all over Southwest Ohio, has put together a conference you’ll remember for years to come. The Technical Program Committee has also assembled technical sessions that will appeal to the various aspects of water. Vote Water! 2016 covers water resources management through treatment and supply, as well as administrative tasks such as customer service, and research activities. The Conference wraps-up Friday with discussions with OEPA personnel, and about regulatory aspects which impact our water community.

Technical Sessions are available each day of the conference, beginning with “Early Bird” sessions on Tuesday. The annual golf tournament will once again be held at the Kenton County GC, and we’ll be gathering Downtown Cincinnati Tuesday evening with a Welcome Event prior to the official start of the Annual Conference.

With an anticipated 100 exhibitors on Wednesday, don’t miss out on gaining additional contact hours by participating in the Exhibit Tours. And don’t forget to support your District or local Tapping and Top Ops Teams during the Exhibits.

You can visit our website http://www.oawwa.org for conference updates and additional forms. See you in Cincinnati!

Robin Rupe
Ohio Section Chair

Support the Ohio Hydro Party!

Join us in Cincinnati, September 13-16 for the Ohio Section Annual Conference and Vote Water!
## PRELIMINARY SCHEDULE
(subject to change; check the OAWWA website for updated information)

### Tuesday, September 13
- Registration: Hilton
- Golf Outing: Kenton County Golf Course
- Early Bird Workshop: Hilton
- Spouse/Guest Program: Hilton
- Exhibit Setup: Duke Energy Convention Center
- Welcome Event: Downtown Cincinnati (location TBD)

### Wednesday, September 14
- Registration: Hilton
- Exhibit Setup: Duke Energy Convention Center
- Kickoff Breakfast/Awards: Hilton
- Exhibits Open: Duke Energy Convention Center
- Spouse/Guest Program: Hilton
- Competitions: Duke Energy Convention Center
- MAC Lunch: Duke Energy Convention Center
- Exhibit Education Tours: Duke Energy Convention Center
- MAC Reception: Duke Energy Convention Center

### Thursday, September 15
- Registration: Hilton
- Continental Breakfast: Hilton
- Concurrent Technical Sessions (am): Hilton
- Spouse/Guest Program: Hilton
- Business Lunch and Awards: Hilton
- Concurrent Technical Sessions (pm): Hilton
- Gala Reception / Awards: Hilton

### Friday, September 16
- Registration: Hilton
- Continental Breakfast: Hilton
- AWWA Awardee / Past Chairs Breakfast: Hilton
- Concurrent Technical Sessions (am): Hilton
- Spouse/Guest Program: Hilton
- Tour: Hilton
2016 Ohio Section Annual Conference
Cincinnati | September 13-16, 2016
Hilton Cincinnati Netherland Plaza and Duke Energy Convention Center

Special Guests and Spouses!
Welcome to Cincinnati! We have four fun filled days planned for your visit. We have shopping trips, tours of a world famous potter and our downtown art scene, scrumptious lunch destinations, and opportunities for you to indulge your creative side. We will whet your appetite with some of the things Cincinnati has to offer and will leave you wanting to come back for another visit.

Please stay tuned for the Summer newsletter for further details of the program. We look forward to your visit; September will be here before you know it.

Tuesday Night Pre-Conference Welcome Gathering
This is definitely tops on my ballot. Let's start the conference off right (or to the left, whatever your political leanings)! What better way to unwind after a long drive or a day of golf than to join your fellow water professionals for an evening of fun catching up with old friends and making new ones? This event is always popular and we are planning a great evening once again. Don't be left out! Early registration is only $20 (before Aug 12) and includes great hors d’oeuvres and drink tickets. See the OAWWA website and the Summer newsletter for more details.

Water Plant Tour
The Richard Miller Treatment Plant is a state of the art drinking water treatment plant located on Cincinnati’s east side. The core of the plant came into operation in 1907 and is still operational today and the Old River Station at the plant is a registered AWWA landmark. The 240 MGD rated capacity treatment plant has undergone several major updates and includes conventional treatment, three days of off-stream storage, GAC contactors with on-site reactivation, and the recently commissioned UV treatment system. With the UV system, this plant is capable of 7-log Cryptosporidium reduction. The plant tour will be held on Friday. Pre-registration is required.

Pre-Conference Research Committee Workshop
The Research Committee continues its tradition of offering a high-quality pre-conference workshop this year. Come hear about some of the latest Research and take the opportunity to learn from your fellow water professionals in this value added workshop. This year’s topic is entitled “The Problems and Perils of Cyanotoxin Sampling and Analysis”. In addition, the Early Bird Session will include a tour of the USEPA’s Andrew W. Breidenbach Environmental Research Center laboratories. Look for the final agenda and contact hour information this summer in the Newsletter or on the Ohio Section AWWA website. This event is open to all registrants and you do not need to be a member of the Research Committee to attend.
VOTE WATER

2016 Ohio Section Annual Conference
Cincinnati | September 13-16, 2016
Hilton Cincinnati Netherland Plaza and Duke Energy Convention Center

HILTON RESERVATIONS
Quick and Easy Reservations for Attendees

The Hilton Netherland Plaza Cincinnati is located at 35 West Fifth Street in Cincinnati, Ohio. The telephone number for the Hilton Netherland is +1(513) 421-9100.

**Single Rate:** starting at $175 a night
**Double Rate:** starting at $185 a night

*Book by AUGUST 22<sup>nd</sup> to reserve your room!*

Register Online by visiting the Ohio Section AWWA website or by going to the following web address: https://resweb.passkey.com/go/OAWWASep2016 or contact the Hilton directly at **1-800-HILTONS** (be sure to mention the group name: OAWWA)

GOLF OUTING AND COOKOUT
On Tuesday, September 13, 2016 at The Golf Courses at Kenton County

We have reserved both the Pioneer and Willows courses for the outing. The Pioneer course plays to 6,010 yds. at par 71 with the Willows course playing to 6,734 yds. at par 72. Registration will be opening soon. See OAWWA website and Summer Newsletter for registration info. Be sure to register as early as possible to guarantee the course of your choice.

- Scramble Format
- Lunch (Provided at the turn)
- Prizes for Longest Drive, Closest to the Pin, Etc.
- Awards for Top Three Teams on Each Course
- Door Prizes

**Day Schedule**

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<tr>
<td>Registration</td>
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<td>Shotgun Start</td>
<td>11:00 am</td>
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<tr>
<td>Cookout (Provided at the turn)</td>
<td>11:00 am – 2:30 pm</td>
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<tr>
<td>Awarding of Golf Prizes</td>
<td>5:00 pm</td>
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</tbody>
</table>

For Golf Outing Questions contact Jason DeLaet: (513) 591-5007

3908 Richardson Road
Independence, Kentucky 41051
2016 REGISTRATION CATEGORY EXPLANATIONS

The early registration deadline is August 12, 2016. Your AWWA membership number is required on the registration form to qualify for the member rate. To obtain the retiree rate, you must be recognized as a retiree on your AWWA membership. To obtain the student rate, a current student ID is required.

**Full Registration:** This includes Technical Sessions (Thursday and Friday), the Exhibits & Educational Tours, the Kick-Off Breakfast, The MAC Luncheon and Mixer, the Business Luncheon, and the Annual Reception & Gala. The Research Committee Workshop, Plant Tour, Golf and Tuesday’s Social event are not included.

**One-Day Registration (Wednesday):** This includes the Kick-Off Breakfast, the Exhibits & Educational Tours, and the MAC Luncheon and Mixer.

**One-Day Registration (Thursday):** This includes the Technical Sessions, the Business Luncheon, and the Annual Reception & Gala.

**One-Day Registration (Friday):** This includes the Friday Technical Sessions.

**Full Spouses/Guest Program:** This includes all Spouse/Guest Activities and Tours, The Hospitality Suite, the Kick-Off Breakfast, the MAC Mixer and the Annual Reception & Gala.

**Limited Spouse/Guest Program:** This includes all Spouse/Guest Activities and Tours, the Hospitality Suite and the MAC Mixer. It does not include the Kick-Off Breakfast, Business Luncheon or the Annual Reception & Gala.

**Research Committee Pre-Conference Workshop:** This includes the technical program, lunch and break refreshments. This workshop has an additional fee and is not included in the Full Conference Registration package.

**Water Plant Tour:** This includes a technical tour of the Richard Miller Treatment Plant, transportation to and from the water plant, and refreshments at the plant. This tour has an additional fee and is not included in the Full Conference Registration package.

**Tuesday Night Mixer:** This includes entry into the Tuesday night pre-conference mixer. Hors d’oeuvres and drink tickets will be provided for registrants.

**Budget Options:** This includes the technical sessions for the day selected or for the entire conference (Wednesday – Friday), as well as break refreshments. It does not include any meal functions, mixers or receptions.

**Exhibitor Registration:** This includes Exhibit booth fees for three persons working the booth, three MAC Luncheon Tickets, three Technical registrations, six MAC Reception tickets and a $25.00 donation to Water for People. Further information is available in the Exhibitor Registration Packet.
2016 Ohio Section Annual Conference
Cincinnati | September 13-16, 2016
Hilton Cincinnati Netherland Plaza and Duke Energy Convention Center

ATTENDEE REGISTRATION
First Name: ____________________________
Last Name: ____________________________
EPA CORE ID: __________________________
Company: ______________________________
Phone: ________________________________
Mailing Address: _______________________ 
Email: ________________________________ AWWA Member #: __________________

REGISTRATION by 8/12 8/12-9/2
Full Conference
Member $295 $345
Nonmember $395 $445
Retired Member $200 $235
Retired Nonmember $300 $335
One Day Registration – includes meals
Weds Only Member $170 $195
Weds Only Nonmember $220 $245
Thurs Only Member $170 $195
Thurs Only Nonmember $220 $245
Friday Only Member $90 $115
Friday Only Nonmember $100 $115
Spouse Program
Full Program $195 $245
Limited Program $140 $190
Research Workshop
Member $85 $110
Nonmember $135 $160
Student (ID req’d) $45 $60
Water Plant Tour $35 $50
Tuesday Night Mixer $20 $25

Budget Options – No meals or events included
Weds Expo & Ed Tours
Member $50 $75
Nonmember $80 $105
Thursday Technical Sessions
Member $75 $100
Nonmember $110 $135
Friday Technical Sessions
Member $50 $75
Nonmember $80 $105
Full Technical Program
Member $160 $185
Nonmember $190 $205
Student $50 $75

Extra Meal Tickets

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REGISTRATION by 8/12 8/12-9/2

Payment Information
Payments must be made out to OAWWA

Grand Total: $__________

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Invoice My Company*
Credit Card:
Visa
Mastercard
Discover
AMEX

*invoice will be sent to address above

Credit Card Information
Name (as it appears on card; please print):

Card Number: ____________________________
CVV Code: ____________________________
Expiration Date: _______________________
Billing Zip Code: _______________________

Authorized Signature — I hereby agree to the terms and conditions of my card issuer agreement.

Please send with payment to: OAWWA
17 S High St, Suite 200
Columbus, OH 43215

***Cancellation policy: Full refund if cancellation is received by September 1, 2016. There will be no refunds after that date.***

Call Emily Davis at 844.766.2845 with registration questions!
COMPETITIONS

2015 Ohio Section AWWA Tapping Contest

The Ohio Section Tapping Committee would like to invite Ohio Water Utilities to send a tapping team to the Section Tapping Contest. This year’s contest will be held on Wednesday, September 14th in Cincinnati. The winner of our Section contest will be given the opportunity to represent the Ohio Section at the Annual Conference and Exhibition (ACE) in Philadelphia, June 11-14, 2017.

To register your team for this event, please complete this form (one form per team) and submit to Mike Gradoville at mgradoville@aymcdonald.com by August 15, 2016

---

**Tapping Contest Entry Form:**

---

Utility Name:
Contact Name:
Address: _______________________________________________________________
City: ____________________ State: ________ Zip Code:____________________
Phone:______________________ Fax: ______________________________________
E-mail: _________________________________________________________________

---

**Meter Madness**

The winners of the District Competitions at the April Southern Ohio Utility EXPO (SE & SW) and the Northern Ohio Water and Wastewater EXPO (NE & NW) will compete head-to-head during the MAC Mixer on Wednesday, September 14, 2016. Come cheer on your District champion as they compete to represent the Ohio Section at the Annual Conference and Exposition (ACE) in Philadelphia in June, 2017.

**Top Ops**

Calling all District Teams!! Do you have what it takes to be crowned the Ohio Section Top Ops Champion for 2016 and go on to Philadelphia in 2017? The annual competition will be held on Wednesday, September 14, 2016 and will feature the winners of the summer District meeting competitions. Contact Mike Gradoville at mgradoville@aymcdonald.com or Kevin Gleich at kgleich@columbus.gov for more information.
EXPO TOUR REGISTRATION

First Presenter: ________________________________
Second Presenter: ______________________________
Company: ______________________________________
Email: ________________________________________
Address: ______________________________________
City, State, Zip: ________________________________

On **Wednesday, September 14, 2016**, during the Ohio Section AWWA Annual Conference in Cincinnati, exhibitors will have a unique opportunity to showcase their products or services and help attendees, **Ohio EPA Certified Operators, Registered Sanitarians and Professional Engineers**, earn contact hours (subject to OEPA approval) or continuing education credits. Presenters are sought to cover highlights or products, services, or solutions that they provide. Each presenter will be allowed 15 minutes to speak **at their booth**. Guided groups of attendees will visit booths at scheduled intervals. In order to obtain approval from the OEPA, the presentation must be educational in nature. To participate, please complete and submit this form **no later August 1, 2016**. No submissions will be accepted after this date.

**Note:** Presentation summary and presenter bios MUST be submitted with this form.

Please check only one topic below to indicate the subject of your presentation:

- Distribution System
- Hydrants
- Lab
- Tanks
- Pipes
- Water Treatment Equipment
- Safety Equipment
- Chemicals

Applicable to (check all that apply):

- Water Operators
- Registered Sanitarians
- Wastewater Operators
- Professional Engineers

For additional information and requirements, please contact:
Emily Davis
Ohio Section AWWA
844.766.2845
oawwa@assnoffices.com

To register online, go to:
https://oawwa.formstack.com/forms/2016expo
EXHIBITOR INFORMATION

Location: Duke Energy Convention Center (513-419-7300)

Tradeshow Hours: Wednesday, September 14, 2016 10:00 AM – 5:00 PM

Shipping: Exhibit shipments will be received by the General Services Contractor. Information to be provided.

Set Up Hours: Tuesday, September 13, 2016 — 3:00 PM – 5:00 PM Wednesday, September 14, 2016 — 7:30 AM – 9:30 AM

Exhibit Removal: All exhibits must be removed Thursday, September 15, 2016 by 11:00 AM!

Booth: 10’ x 10’ Booth, carpeted with pipe & drape, skirted table, two chairs, sign with Exhibitor name

Exhibit Fees: $625 by June 30, 2016; $725 after June 30, 2016

Additional Booth Attendees: $95 by June 30, 2016; $110 after June 30, 2016

Exhibit fee includes booth plus Exhibit day registrations, lunch and MAC social activities for three (3) Exhibit booth attendees, three (3) technical conference registrations and a $25 donation to Water For People. Additional booth attendees, $95 ($110 late) with items listed above. There are additional fees for electric, internet, phone, water, etc. Fees to be furnished in the exhibitor’s packet.

Register Online or return your completed form and payment, payable to OAWWA: 17 S High St, Suite 200, Columbus, OH 43215

EXHIBITOR AGREEMENT

The undersigned Tabletop Exhibitor (hereinafter referred to as the Exhibitor) hereby agrees to participate in the Tabletop Exhibits at the Ohio Section AWWA Conference, Wednesday, September 14, 2016 as described herein and in the Exhibitor information. The Exhibitor agrees to pay the designated Exhibitor’s registration fee of $625 postmarked by June 30, 2016, or $725 postmarked after June 30, 2016. The Exhibitor also agrees to all terms of the “Liability and Responsibility” clause, which is part of this contract. In the event that an Exhibitor wishes to cancel the contract and forfeit the exhibit space, a full refund of the registration fees will be made up to August 14, 2016. No refunds will be made after that date.

Liability and Responsibility

By signing registration form, the Exhibitor agrees to assume full liability and responsibility for any and all injuries, losses, damages, claims, or expenses (including attorney fees) arising from injury or damage to Exhibitor’s displays, equipment, and other property brought upon the Duke Energy Convention Center premises. The Exhibitor shall indemnify and hold harmless the Ohio Section AWWA (OAWWA), the Duke Energy Convention Center, the City of Cincinnati, and the officers, agents, servants, members, and employees of each organization for any and all injuries, losses, damages, claims, and expenses.

The Exhibitor also agrees to hold harmless the OAWWA, the Duke Energy Convention Center and the City of Cincinnati for any and all injuries, losses, damages, claims, or expenses (including attorney fees) that may occur to the Exhibitor, the Exhibitor’s employees or property, or to any other person or property by reason of the Exhibitor’s use of the exhibition facilities prior to, during, or subsequent to the period covered by this contract and agrees to expressly release OAWWA, the Duke Energy Convention Center and the City of Cincinnati from such liability.

The indemnification obligation set forth shall be void as to an indemnitive, including its officers, agents, servants, members, and employees whose negligence or willful misconduct was the sole cause of the incident given rise to the injury, loss, damage, or claim. This indemnification shall not be limited in any way by limitation on the amount or type of damages, compensation, or benefits payable by or for the Exhibitor under workers compensation acts, disability benefit acts, or other employee benefit acts.

The exhibition event is scheduled from 10:00 AM to 5:00 PM on September 14, 2016. It is mutually agreed that it is the duty and responsibility of each Exhibitor to install their exhibit before the opening of the exhibition event and to dismantle their exhibit after the exhibition event closes according to the Exhibitor’s Information section contained in the prospectus. Under no circumstances shall an Exhibitor dismantle their exhibit before the closing of the exhibition event (5:00 PM on September 14, 2016) without prior permission of the Conference Exhibition Committee.
EXHIBITOR REGISTRATION

Company: ____________________________
Contact Name: ______________________
Billing Address: ______________________
City, State, Zip: ______________________
Phone: ______________________________
Email: ______________________________

Booth Attendee Information
Please check box to indicate primary onsite contact

☐ Name (first and last): __________________
☐ Name (first and last): __________________
☐ Name (first and last): __________________
☐ Name (first and last): __________________
☐ Name (first and last): __________________
☐ Name (first and last): __________________

Exhibitor Fees:
$625 – By June 30, 2016
$725 – After June 30, 2016

Additional Booth Attendee:
$95 by June 30, 2016
$110 after June 30, 2016

Exhibitor fees include booth plus exhibit day registrations, lunch and MAC Mixer tickets for up to three (3) booth attendees. There are additional fees for electric, internet, phone, water, etc. More information & costs furnished in exhibitor’s packet sent prior to the conference.

DEADLINE for booth registration is August 26, 2016.

Questions? Contact Emily Davis, OAWWA Office at: oawwa@assnoffices.com or Tim Shaw, Exhibit Chair, at: tshaw@hpthompson.com

NEW THIS YEAR

Please register online for faster service! Booths are assigned on a first come, first serve basis. Registration by mail or fax is delayed up to 7 days for processing by OAWWA staff once your form is received. Errors or missing information on paper forms will delay your registration even longer.

To register online, go to:
https://oawwa.formstack.com/forms/2016exhibitor

Payment Information

Payments must be made out to OAWWA

Grand Total: __________________

☐ Check
☐ Credit Card:
  ☐ Visa  ☐ Mastercard
  ☐ Discover  ☐ AMEX

Credit Card Information
Name (as it appears on card; please print):

____________________________________
Card Number: ________________________
CVV Code: __________________________
Expiration Date: ______________________
Billing Zip Code: _____________________

Authorized Signature — I hereby agree to the terms and conditions of my card issuer agreement.

By signing below, I have read and accept the terms of the Exhibitor Agreement.

____________________________________

Please send with payment to:
OAWWA
17 S High St, Suite 200
Columbus, OH 43215
Or scan and email to: oawwa@assnoffices.com

Payment Information

NEW THIS YEAR
2016 Ohio Section Annual Conference
Cincinnati | September 13-16, 2016
Hilton Cincinnati Netherland Plaza and Duke Energy Convention Center

SPONSOR REGISTRATION

Company: ____________________________
Contact Name: ________________________
Billing Address: ________________________
City, State, Zip: ________________________
Phone: ______________________________
Email: ________________________________

Please indicate your level of sponsorship below:

- [ ] Premier Level
  - Two (2) complimentary Full Conference registrations
    - Pre-Gala Reception - $10,000
    - Thursday Breakfast - $15,000
    - Friday Breakfast - $15,000

- [ ] Platinum Level - $1,500
  - One (1) complimentary Full Conference registration
    - Wednesday Break Refreshments (2)
    - Thursday Break Refreshments (2)
    - Attendee Gift (5)

- [ ] Gold Sponsor - $1,250
  - One (1) complimentary Full Thursday registration
    - Tuesday Pre-Con Reception Beverages (2)
    - On-Site Conference Program (2)

- [ ] Silver Sponsor - $1,000
  - One (1) Thursday night Reception & Gala ticket
    - Awardee/Past Chair Breakfast (2)
    - Gala Entertainment (2)

- [ ] Bronze Sponsor - $750
  - Tour Transportation (1)
    - Research Workshop Breaks (1)
    - Spouse Program Suite Refreshments (1)
    - Annual Reception & Gala Decorations (2)
    - Friday Break Refreshments (3)

- [ ] Golf Hole - $200
- [ ] Golf Refreshments - $150
- [ ] Golf Prize - $125

Grand Total: _____________

Complimentary Registration
OAWWA staff will contact this person for more detailed registration information.

Name (first and last): ____________________________
Email: ________________________________
Name (first and last): ____________________________
Email: ________________________________

Payment Information

Payments must be made out to OAWWA

Grand Total: $ _____________

- [ ] Check
- [ ] Credit Card:
  - [ ] Visa
  - [ ] Mastercard
  - [ ] Discover
  - [ ] AMEX

Credit Card Information
Name (as it appears on card; please print):

Card Number: ____________________________
CVV Code: ____________________________
Expiration Date: ____________________________
Billing Zip Code: ____________________________

Authorized Signature — I hereby agree to the terms and conditions of my card issuer agreement.

Please send with payment to:
OAWWA
17 S High St, Suite 200
Columbus, OH 43215
Or scan and email to: oawwa@assnoffices.com

Payment Information

Grand Total: $ _____________

Payments must be made out to OAWWA

Check
Credit Card:
  - [ ] Visa
  - [ ] Mastercard
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  - Annual Reception & Gala Decorations (9/15): Provide table top & room decorations for the annual Reception & Gala. These decorations will also be awarded as door prizes to attendees. (1 sponsorship available)
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Todd Danielson, Rick Eberle and Steve Heimlich - Avon Lake Regional Water
Craig Suehrstedt, Isabelle Hammer and Tim Wolfe – MWH Americas, Inc.

CONTRIBUTING EVENTS

On a cold winter’s night in January 2014 frazil ice showed signs of raising its ugly head along the southern shore of Lake Erie in Avon Lake (and elsewhere). The event that began around 9 p.m. on January 7th led to a challenging 40-hour event for Avon Lake Regional Water. It wasn’t until January 9th that the water filtration plant (WFP) was fully functioning again and the finished-water storage tanks had been re-filled. Innovative emergency measures that were implemented to maintain system pressure and continue to meet finished-water demands included:

- back-flushing the intake with water from basins in the WFP, and
- setting up auxiliary pumps / piping to deliver source water directly from the Lake to the WFP (bypassing the Lake intake).

Avon Lake Regional Water staff immediately implemented operations changes to help mitigate future frazil ice issues and began planning for longer-term solutions. If frazil ice periodically reducing the capacity of the source-water intakes wasn’t enough, Avon Lake Regional Water must also respond at times to deteriorating source-water quality associated with Lake Erie dead-zone events and potentially harmful algal blooms (HABs).

In an attempt to address all of these issues in a responsible and timely manner, Avon Lake Regional Water determined that a multi-pronged approach to improving reliability and redundancy was necessary. Each prong would move forward and help the system independently. Collectively, the system would become much more resilient. This approach became one of Avon Lake Regional Water's five initiatives in its strategic plan and
included intake, treatment, and storage improvements; interconnection with other systems; and other work.  

In 2014, Avon Lake Regional Water began the initial design work for the capital improvements that would be necessary. MWH Americas was selected to assist Avon Lake Regional Water in preparing the preliminary engineering for improvements at its WFP. Only one-month after the preliminary engineering was initiated, the governor announced the availability of zero-interest funding to help respond to HABs. However, to qualify, projects needed to be shovel-ready (i.e., bid for conventional design-bid-build projects, or a guaranteed maximum price, GMP, in place for alternative-delivery projects) by June 2015. Wanting to minimize the impact on customer water rates, Avon Lake Regional Water chose in early January 2015 to pursue an alternative-project delivery for improvements at the WFP based on a construction manager at risk (CMAR) approach.  

THE WFP IMPROVEMENT PLAN  

A progressive public water system (PWS), Avon Lake Regional Water began plans to upgrade and expand its existing WFP to address Lake Erie HABs and dead-zone issues, improve reliability and continue to meet increasing water demands. The plan that was developed and is currently being implemented includes (see Figure 1):  
1. Installing two new Clearwells (7 & 8) and an associated finished-water Pump station on the site owned by Avon Lake Regional Water that is located south of Lake Road (adjacent to the existing WFP located just north of Lake Road),  
2. Constructing a new 3.0-MG elevated storage tank in Avon Lake’s portion of the distribution system,  
3. Providing new piping connections between the existing filters and the new clearwells / finished-water pump station, and also between the new pump station and the existing water-distribution system. When completed finished water will be conveyed to the extensive Avon Lake Regional Water distribution system through either: a) the new South finished-water pump station, or b) the existing Central finished-water pump station (The existing North finished-water pump station is to be abandoned.),  
4. Converting the older, existing Clearwells 1 to 4 to attenuation basins for recycling spent backwash water from existing filters 1 to 24 to provide reliability for the new recycle program.  
5. Upgrading the media of Filters 13 to 20 to better respond to HABs and dead-zone events associated with Lake Erie.  

Avon Lake Regional Water is already considering future WFP improvements to stay ahead of the curve, including: conversion from liquid chlorine to sodium hypochlorite, and installing advanced unit-treatment processes like intermediate ozone (in conjunction with biologically-active filtration) and post-filter UV. Also the capital improvements included with this expansion / upgrade project are being designed for equivalent, maximum-day capacities of 60 MGD (current WFP approved capacity is 50 MGD), with the ability to easily expand the facilities to a capacity of 70 MGD.  

PLAN DETAILS  

Avon Lake Regional Water is a rapidly-growing PWS that provides water for 200,000+ people in a 680 sq mi area that covers seven counties (Figure 2). Eighty-five percent of the finished water is supplied to customers outside the confines of Avon Lake, including:  
• Avon,  
• Medina,  
• Medina County,  
• North Ridgeville,  
• Rural Lorain County Water Authority (RL-CWA),  
• Sheffield, and  
• Sheffield Lake.  

Average-day production for Avon Lake Regional Water’s WFP is in the 20 – 25 MGD range.
Additional **finished-water storage**, both on site and in Avon Lake's portion of the distribution system, positions Avon Lake Regional Water to better respond to HAB, dead zone, frazil ice and system reliability issues. Currently, the Avon Lake Regional Water WFP has a seasonal approved capacity of 50 million gallons per day (MGD) in the summer and a 40 MGD in the winter, limited by the existing clearwell system. As Avon Lake Regional Water plans to meet growing customer finished-water demands, additional finished-water storage volume and finished-water pumping capacity increases the WFP's approved capacity first to 60 and then 70 MGD (see Figure 3 for construction of new clearwells).

Avon Lake Regional Water provides finished water to several other communities directly and through the Rural Lorain County Water Authority (RLCWA). RLCWA receives finished water from Avon Lake Regional Water through a large booster pump station located on the south side of Avon Lake. A larger, and higher overhead finished-water storage tank in Avon Lake's portion of the extensive distribution system would better position Avon Lake Regional Water to provide adequate time for WFP shut-downs to perform preventative and/or emergency maintenance. A water-distribution study completed showed significant benefit with a **3.0-MG elevated storage tank** (at a higher elevation than existing finished-water tanks) located between the WFP and RLCWA's booster pump station. (See Figure 4 for a progression picture of Avon, Ohio's water tank [similar to the one being designed for Avon Lake Regional Water being elevated into place. Photos taken by CT Consultants.)

Backwashing frequency has increased with increasing filtration rate and periodically with algae associated with the dead zone in Lake Erie. Spent backwash volumes conveyed directly to the sewer system without attenuation cause process issues at Avon Lake's wastewater treatment plant, especially during the winter. The older, existing Clearwells 1 to 4 have limited CT and hydraulic capacity and are difficult to upgrade and/or expand due to their location. The existing North-high finished-water pump station has similar constraints. **Conversion of these Clearwells 1 to 4 into spent filter backwash water attenuation basins facilitates** equalization of the quality of the spent filter washwater and discharge to the sewer system at a slower and more uniform rate. Spent washwater can be recycled most of the time at a uniform rate
to the wet well of the WFP's source-water pump station, when quality of the washwater permits.

The existing WFP has 24 dual-media filters. Filters 13- 20 at Avon Lake Regional Water’s WFP have not been updated in quite some time. Source-water challenges being encountered with drinking water rules and periodically with Lake Erie (e.g., lower required combined filtered-water turbidity values, HABs, algae associated with the dead zone, etc.) suggest it is time to rehabilitate these filters. **The existing filter rehabilitation includes:**
1. Replacement of filter media.
2. Replacement of filter control consoles.
3. Replacement of most of the filter valves and actuators.
4. Replacement of loss of head and rate of flow (differential-pressure cells) monitors.

**CMAR**

**In early January 2015 Avon Lake Regional Water had:**
- a preliminary engineering report for capital improvements to address: HABs, dead-zone issues, finished-water quality/quantity and reliability for each of the issues discussed above, and
- an agreement with Ohio EPA for a zero-percent loan for the improvements that were meant to help respond to HABs.

To take advantage of this zero-percent loan - prior to June 30, 2015, Avon Lake Regional Water had to either bid a design-bid-build project or provide Ohio EPA with a GMP for an alternative-delivery project in four months, while also obtaining Ohio EPA Plan Approval. Staff chose to proceed with CMAR and secured MWH Americas to perform the design, and subsequently MWH Constructors as the CMAR contractor.

The CMAR was selected using: a) a qualifications-based selection process during the initial Request for Qualifications (RFQ) stage to develop a short list, and b) a best-value selection process during the final Request for Proposal stage for the final CMAR selection. Qualifications-based selection criteria for were established for the RFQ. Best-value criteria used in evaluating proposals from the short-listed firms included factors that were determined to derive or offer the greatest value to Avon Lake Regional Water, combining both qualifications and fee.

In January 2015 - among PWSs applying for Ohio EPA zero-interest loans - Avon Lake Regional Water was near the end of the list in terms of being shovel ready. The CMAR schedule shown below was followed and Avon Lake Regional Water moved to near the head of list by late April – early May. Working closely and effectively with Ohio EPA resulted in plan approval being obtained from the Agency in less than two months – which helped immensely in meeting the June 30 deadline for zero-percent interest loans.

---

**Figure 4**

continued on page 44
BACK TO THE BIGGER PICTURE

Water utilities provide an indispensable public service—clean, safe drinking water whenever a customer (e.g., person, hospital, fire department, industry…) needs it. With aging infrastructure, stronger and more severe weather patterns, population growth, and increasing expectations, utilities must reconsider if the way they are currently providing service is the way they should continue to provide service and if there are inexpensive changes they can make to improve the level of service. Avon Lake Regional Water updated its master plan to prioritize improvements that provide the most benefit to customers at a reasonable cost. To cost-effectively meet increasing water production needs Avon Lake Regional Water recently completed a third Ohio EPA full-scale demonstration study to high rate some of the treatment processes at its existing WFP. In its continuing mission to provide safe, reliable, cost-effective water to its customers, for this project Avon Lake Regional Water ventured into new things including a new project-delivery approach and interconnection to other PWSs. Avon Lake Regional Water has found that customer expectations regarding level of service have changed over recent years, and customers are more willing to pay a little bit more for a higher level of service. To undertake the multi-pronged approach to improving resiliency, Avon Lake Regional Water will be spending approximately $35 million. Much of the work will be funded using zero-percent interest loans offered by Ohio EPA, which saves more than $350,000 per year in interest expenses. Keeping the actual cost to the customer in mind, each account will pay approximately $2 per month for this improved level of service.

ACKNOWLEDGEMENTS

The zero-percent interest loan for many of the capital improvements associated with this project would not have happened without the excellent plan approval response provided by Ohio EPA staff. Mr. James Salerno and MWH Constructors were very helpful in identifying cost-saving ideas during the early stages of design and providing oversight on the CMAR portion of this project. Dr. Stan Zachopoulos and Mr. Bob Hrusovsky of MWH Americas were very helpful during the pre-design and design phases. Last, but not least, superior treatment services provided by Avon Lake Regional Water staff at the WFP made it possible to implement these improvements.

<table>
<thead>
<tr>
<th>Event</th>
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<tbody>
<tr>
<td>RFQ Posted and Advertised</td>
<td>February 4, 2015</td>
</tr>
<tr>
<td>Qualifications Due</td>
<td>February 20, 2015</td>
</tr>
<tr>
<td>Request For Proposals issued to the Short-Listed Firms</td>
<td>February 24, 2015</td>
</tr>
<tr>
<td>Pre-Proposal Conference (all proposers) including Site Visit</td>
<td>February 27, 2015</td>
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<tr>
<td>Submittal of Preliminary Design to Ohio EPA for Plan Approval</td>
<td>March 13, 2015</td>
</tr>
<tr>
<td>Proprietary Pre-Proposal Meetings (Individual CMAR Firms and Owner)</td>
<td>March 10-11, 2015</td>
</tr>
<tr>
<td>Proposals Due</td>
<td>March 20, 2015</td>
</tr>
<tr>
<td>Interviews (Optional)</td>
<td>March 25, 2015</td>
</tr>
<tr>
<td>Tentative Selection of CMAR</td>
<td>March 26, 2015</td>
</tr>
<tr>
<td>Completion of 30% Design</td>
<td>March 27, 2015</td>
</tr>
<tr>
<td>Confirmation of CMAR Selection at Board Meeting</td>
<td>April 7, 2015</td>
</tr>
<tr>
<td>Establish a Guaranteed Maximum Price (GMP)</td>
<td>May 5, 2015</td>
</tr>
<tr>
<td>GMP Negotiations</td>
<td>May 7-8, 2015</td>
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<tr>
<td>GMP Amendment</td>
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</table>
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How System Hydraulics and Electric Costs are Related

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In consideration of a pumping system, it is important to understand the relationship between hydraulics and power consumption. Owners can utilize improvements to their system that may increase effectiveness of pumping and reduce energy demands.

Once a pumping system has failed or a decision is required to replace or repair the pump and/or motor, the owner will be required to look at the factors that led to the failure and to the changes within the pumping facility.

Pumping systems account for nearly 50 percent of the electricity used by pumping-intense fields such as municipal water and wastewater industries. A study completed by U.S. Department of Energy study concluded that the optimization of pumping systems can reduce facilities energy costs by 20 percent. This study also concluded that pumping system optimization can typically prove benefits such as life-cycle costs savings obtained through reduced maintenance costs, improved system reliability, enhanced process control and extended product quality.

Primary considerations during the review of determining repair versus replacement of pumping components should include:
- energy use and efficiency before and after a repair;
- efficiency of a new motor, operation hours, and load against the original machine to some threshold;
- availability of replacement components;
- number of previous repairs;
- review of what was repaired and how work was performed;
- machine reliability;
- general conditions;
- effects of downtime on profits;
- number of inventory spares and parts; and
- changes within the hydraulic system.

While evaluating the life-cycle costs of a repair or replacement, the owner should consider the following:
- the cost to purchase, install, operate (including energy costs), maintain and dispose of all system components;
- the components that make up the total costs of a pumping system that provide an opportunity to reduce energy, operational and maintenance costs;
- life of the pumping system; and
- operational factors including water hammer, variable speed drives (VFD), slow opening valves, soft start motors and fluid velocity.

A well designed system allows for the selection of a smaller pump and motor, thereby reducing both the purchase price and life-cycle costs. A well designed system will operate at the BEP thus reducing electric costs. Consideration should be given knowing that aging will move the pump away from the BEP.
The hydraulics of the system should be reviewed prior to concluding whether to replace or repair a pump. One common mistake of replacing a pump is that the same pump style or model could be installed. While this option may be convenient because the existing contract documents and user manual are available on the owners’ shelves and that the existing pump suction and discharge configurations are identical, the entire hydraulics should be reviewed. Changes to the entire system will affect the pump selections. System hydraulics such as baseline demands, seasonal variations, fire demands, diurnal variations, peak demands and storage availability should be considered. Factors that affect the system hydraulics include:

- age of pipes;
- new customers or demographics;
- change in service areas;
- addition and utilization of storage;
- control valves;
- distribution valves;
- system suction head;
- system discharge head;
- exit conditions;
- incentives for operating conditions from the electric company;
- frequency and operation hours.

Reinstating the above factors, a pumping system designed 15 years ago may not apply to the current hydraulic system.

Evaluating the existing and future system hydraulics should be made to determine the appropriate pump. This evaluation will define the range of system curves so that the selection of pumps can be made at the best operating point of the system. In determining the system curve, equations such as the Darcy-Weisbach friction loss equation and Hazen-Williams equations may be used.

\[
\text{Darcy-Weisbach equation: } H_f = f \cdot \frac{L}{D} \cdot \frac{v^2}{2g}
\]

\[
\text{Hazen-Williams equation: } Q = 0.279 \cdot C \cdot D^{0.54} \cdot S^{0.54}
\]

A system curve is required to select an appropriate pump for a particular application. The curve is a graphical representation of the energy equation and is a function of the static head and major and minor losses. After a system curve for the range of operation has been calculated, the curve can be plotted in HEAD (feet) versus FLOW (gallons per minute). This curve is used to approximate the best operation point of the system. An example of a system curve is shown below in Figure 1.

Pump characteristics are graphically shown on the pump performance curve which is typically provided by the manufacturer. The characteristics of a pump curve display the relationship between the flowrate and head for an actual pump, efficiency,
net positive suction head (NPSH), impellor diameters, speeds, and power. An example of a pump curve is shown to the left in Figure 2.

The pump curve can be plotted with the system curve to determine the BEP as shown below in Figure 3. The best operation point will generally be close to the BEP. The available NPSH should be greater than the required NPSH to prevent cavitation.

When multiple pumping arrangements are considered, it should be known that in theory, the head capacity is increased by connecting two or more pumps in...
Flow to RPM = a linear relationship \( \frac{\text{RPM}_1}{\text{RPM}_2} = \frac{\text{Q}_1}{\text{Q}_2} \)

Head to RPM = a square relationship \( \frac{\text{H}_1}{\text{H}_2} = \left( \frac{\text{RPM}_1}{\text{RPM}_2} \right)^2 \)

HP to RPM = a cubed relationship \( \frac{\text{H}_1}{\text{H}_2} = \left( \frac{\text{RPM}_1}{\text{RPM}_2} \right)^3 \)

Assumes wheel diameter remains the same.

By increasing speed or impeller size, HP increases, thus increasing KW and electrical costs. Other items to be considered while deciding to make investments to your pumping systems are the type of pump and number of stages to the pump. Single stage pumps and multiple-stage pumps will affect pump selection.

series while the flow capacity is increased by the connection two or more pumps in parallel as shown above in Figures 4 and 5.

While the hydraulics of simple pumping systems are fairly easy to determine, the affinity laws should be investigated while considering pump repairs. The affinity laws state the following:

Flow to RPM = a linear relationship \( \frac{\text{RPM}_1}{\text{RPM}_2} = \frac{\text{Q}_1}{\text{Q}_2} \)

Head to RPM = a square relationship \( \frac{\text{H}_1}{\text{H}_2} = \left( \frac{\text{RPM}_1}{\text{RPM}_2} \right)^2 \)

HP to RPM = a cubed relationship \( \frac{\text{H}_1}{\text{H}_2} = \left( \frac{\text{RPM}_1}{\text{RPM}_2} \right)^3 \)

Assumes wheel diameter remains the same.

The following relationships should be taken into consideration to determine how the affinity laws will affect energy costs.

- Joule = Unit of Energy
- Joule/Sec. = Unit of Power
- Watt = Unit of Power = 1 Joule/Sec
- HP = Unit of Power = 756 Watts
- KW-Hrs = (Hp x 746/1 HP x 1 KW/1000 W) x (hours)
Single Stage pumps typically provide the following features:

- single impeller and volute to generate pressure;
- pressure generated depends on diameter and speed;
- impeller is sole element for transferring energy;
- diameter of impeller is the key element;
- trimming impeller reduces head by reducing transfer of energy;
- distance between impeller and volute determines the pump hydraulic efficiency;
- operating points can be changed by trimming the impeller and/or speed; and
- turn down speed typically 5 percent.

While multiple-stage pumps provide different features that include the following:

- multiple impellers and volutes;
- flow from one impeller through other impellers essentially acting as pumps in series;
- amount of pressure developed depends on diameter of impellers and number of stages;
- impellers are not usually trimmed;
- each impeller can typically be smaller than single stage and have a tighter space between impeller and volute;
- not recommended for liquids containing solids;
- turn down speed typically 17-percent;
- smaller motor/reduced electrical consumption;
- smaller foot print/higher efficiencies; and
- greater turn-down equates in reduction of brake horsepower.

While many issues to pumps and electrical use have been discussed above, FVD considerations should be given to increase operational control and flexibility, reduce energy consumption at non-peak times, provide complete motor protection and diagnostics, allow user interface and system integration, soft starting and stopping, reduce equipment wear, and provide for potential energy savings.

There are many considerations to be given while making improvements to your pumping facilities through repairs or replacements. It is obvious that by performing a complete investigation of the existing and proposed distribution system, determining the appropriate pump configuration, applying the affinity laws, and optimizing your pumping operations can save electrical costs.

REFERENCES:

1. Life Cycle Cost Savings in Water Treatment Pumping Systems by Robert Lax
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The Revised Total Coliform Rule (RTCR) is effective for all Ohio public water systems (PWSs) starting April 1, 2016. A significant modification to the 1989 Total Coliform Rule is the addition of Level 1 and 2 Assessments. The purpose of these assessments is to enhance public health protection by identifying the presence of sanitary defects. One way an assessment is triggered is by sampling results. Under the RTCR, a PWS with sample results that show potential microbial contamination is required to conduct an assessment of the water system to identify and correct any significant deficiencies in the distribution system or treatment processes. If total coliforms are found in drinking water, this suggests that a breach or failure in the water system has occurred, possibly allowing pathogens to enter the water supply. If E. coli is found in the drinking water, this indicates the water system has potentially been contaminated by fecal waste or other pathogenic organisms. Below are more detailed descriptions of Level 1 and Level 2 Assessments.

**LEVEL 1 ASSESSMENT**

A PWS must conduct a Level 1 Assessment if any of the following treatment techniques are triggered:

1) For PWSs taking 40 samples or more per month, the PWS exceeds 5 percent total coliform-positive samples during a month.
2) For PWSs taking less than 40 samples per month, the PWS has two or more total coliform-positive samples during the same month.
3) PWS fails to take every required repeat sample after any single routine total coliform-positive sample.

The Level 1 Assessment is a basic assessment conducted by a knowledgeable representative of the water system. PWSs required to complete a Level 1 Assessment will be instructed by Ohio EPA staff to document the examination of the water system’s source water, treatment, distribution system and relevant operational practices. This documentation must be submitted to Ohio EPA on the Level 1 Assessment form no later than 30 days following notification of the treatment technique trigger. The completed assessment form must include information on any significant deficiencies detected, corrective actions completed and a proposed timetable for remediation.

**LEVEL 2 ASSESSMENT**

A PWS must conduct a Level 2 Assessment if any of the following treatment techniques are triggered:

1) PWS exceeds the E. coli maximum contaminate level.
2) PWS has a second Level 1 treatment technique trigger in a consecutive 12-month period.

A Level 2 Assessment involves a more detailed examination of the water system. The elements of a Level 2 Assessment are the same as those of a Level 1 assessment, but each element is investigated in greater detail. Due to the acute risk to public health, all Level 2 Assessments will be conducted by Ohio EPA staff through a site visit. The findings of the assessment, along with an agreed upon timetable for completing any necessary corrective action, will be memorialized in writing and sent to the water system. It is ultimately the responsibility of the PWS to ensure that the requirements of the Level 2 Assessment are completed.

For more information about Level 1 and Level 2 Assessments, including locating the assessment forms, please visit the Division of Drinking and Ground Waters’ RTCR webpage at [http://epa.ohio.gov/ddagw/rtcr.aspx](http://epa.ohio.gov/ddagw/rtcr.aspx).
Reminder! New Contact Hour Tracking Information & Procedures!

By: Laura Carter, OAWWA Section Manager

The Ohio EPA has launched the Operator Service in the eBusiness Center where Water Operators can view a list of all approved contact hour courses taken. OAWWA uploads all contact hour attendance for district and section meetings into Ohio EPAs eBusiness Center (eBiz) online database. Because of the method of attendance reporting in eBiz, you will need to provide your Ohio EPA Core Person ID number at every OAWWA district or section meeting, as some of you have seen at our meetings held last year. Your Ohio EPA Core Person ID number is the middle seven digits of your operator's certificate number. OAWWA must provide the Ohio EPA with your Core Person ID number when we upload attendance online to the Ohio EPA. If we do not have this information, we will be unable to upload your attendance record in the eBusiness Center. Your OTCO student number cannot be substituted for your Ohio EPA Core Person ID.

Anyone who is certified by Ohio EPA or has applied to take an examination through Ohio EPA (regardless of whether the exam was taken or passed) has an EPA Core Person ID number. Please Do NOT create a new number if you have taken or applied for an examination. If you are unsure if you have an Ohio EPA Core Person ID number, call the Ohio EPA at (614) 644-2752

In order to view your contact hour course attendance list, you need to first create an eBiz account through the Ohio EPAs eBusiness Center website. NOTE: If you are currently using the eBusiness Center to submit operating reports through eDMR or eDWR via a PERSONAL account (not a Business/Utility account) you may use the same account.

Instruction documents for your use in navigating eBiz can be found under the eBusiness Center tab of the Operator Certification Web site: http://epa.ohio.gov/ddagw/opcert.aspx#111264998-ebusiness-center.

Creating a new eBusiness account
1. Go to the eBiz page on the Ohio EPAs website (https://ebiz.epa.ohio.gov/)
2. Click the 'Create New Account' link and create a User ID and a password.
3. You will need to enter your name, address, email address and phone number.
4. Submit your information and you’ve created your account. You will then need to request a PIN.

To request a PIN (electronic signature)
1. Log into eBiz using your User ID and password.
2. In the ‘My Tasks’ section, click the ‘Request New PIN’ link.
3. You will need to verify your contact information.
4. Create five security questions and answers. (Make note of these questions as they cannot be retrieved by Ohio EPA)
5. Click ‘Request PIN’ button
6. After your PIN Request is submitted, you will need to print the 'Subscriber Agreement Form' from the confirmation page or confirmation email.
7. This form needs to be completed and notarized.
8. After the form is notarized, you will mail it to one of the addresses on the confirmation page or email.
9. Once the form is received and approved by the Ohio EPA, your PIN number will be mailed to you.

After you have created your eBusiness account, you will need to request the Operator Service which is listed on the main menu as “Water/Wastewater Operators: Apply for Exams, Renewal and Contact Hours”. You will need your Ohio EPA Core Person ID number to activate the Operator Service. You do not need your PIN to activate the service, but you will need it to submit applications.

Once you have requested the service you should be able to see your profile, a list of exams you have taken and certifies you hold. Under that you will also see all of the contact hours that have been loaded into your account.

Please direct any questions to Emily Davis, Section Assistant at: Emily@assnoffices.com or call 844-766-2843
Important Dates, Events & Newsletter Information

2016 National Conferences

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Name</th>
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</thead>
<tbody>
<tr>
<td>Mar 7-10</td>
<td>Providence, RI</td>
<td>Sustainable Water Management</td>
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<tr>
<td>Jun 19-22</td>
<td>Chicago IL</td>
<td>Annual Conference and Exposition</td>
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2016 State Water Tests

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<tr>
<th>Date</th>
<th>Test Name</th>
<th>Deadline for Application</th>
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<tbody>
<tr>
<td>May 4</td>
<td>Water I / II / III, Water Distribution I / II</td>
<td>February 4</td>
</tr>
<tr>
<td>Nov 10</td>
<td>Water I / II / III, Water Distribution I / II</td>
<td>August 12</td>
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2016 Specialty Conferences

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<th>Date</th>
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<tbody>
<tr>
<td>Jul 12</td>
<td>Water Distribution Workshop</td>
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<tr>
<td>Dec 6</td>
<td>Safe Drinking Water Act Seminar</td>
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<td></td>
<td>(6 Contact Hours Each)</td>
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2016 Review Sessions

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<tr>
<td>Northeast</td>
<td>Apr 16</td>
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<tr>
<td>Northwest</td>
<td>Apr 23</td>
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<tr>
<td>Southeast</td>
<td>Apr 25</td>
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<tr>
<td>Southwest</td>
<td>Apr 23</td>
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2016 AWWA Conference and Exposition

September 13-16, at the Cincinnati Netherlands Hotel

District Conferences (Contact Hours TBA)

Northwest District Meetings

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<thead>
<tr>
<th>Date</th>
<th>Event Name</th>
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<tbody>
<tr>
<td>Apr 14</td>
<td>Northern Expo/ Meter Madness</td>
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<tr>
<td>Mar 24</td>
<td>Toledo</td>
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<tr>
<td>Jul 21</td>
<td>Joint NW/SE - City of Columbus</td>
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<td>Delaware</td>
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Southeast District Meetings

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<tr>
<td>Apr 12</td>
<td>Southern Expo/ Meter Madness</td>
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<tr>
<td>Apr 21</td>
<td>Joint SE/SW Expo - Deer Creek</td>
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<tr>
<td>Jul 15</td>
<td>Miami University</td>
</tr>
<tr>
<td>Oct 14</td>
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Northeast District Meetings

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<td>May 19</td>
<td>Aqua Ohio Massillon</td>
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<tr>
<td>Aug 18</td>
<td>Gervasi Winery Canton</td>
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<td>Oct 6</td>
<td>Painesville</td>
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Southeast District Meetings

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<tr>
<td>Jul 15</td>
<td>Joint SE/NW - City of Columbus</td>
</tr>
<tr>
<td>Date TBD</td>
<td>Columbus Blue Jackets Game</td>
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Deadline for material to be in the 2016 newsletters are:

- Summer Issue - May 13 - Target mailing week of June 13
- Winter Issue - October 7 - Target mailing week of December 5

The Ohio Section Newsletter is the newsletter of the Ohio AWWA, published three times a year. Send comments, news notes, glossy / digital photos, and articles to:

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The ideas, opinions, concepts, procedures, etc. expressed in this publication are those of the individual authors and not necessarily those of the Ohio Section AWWA, its officers, general membership, or the editor.
33rd Annual OAWWA Northern Expo

Where: Buckeye Event Center
       624 Henry Street
       Dalton, Ohio 44618

When: Thursday, April 14th, 2016

Time: Registration begins at 8:30am

For more info: Kevin Givins, Expo Chair
                City of Wooster
                1123 Old Columbus Road
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                Phone# 330-263-5285
                Fax # 330-263-5209
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Where: Buckeye Event Center
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Time: Registration begins at 8:30am

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World Watches Academy Awards Of Water In Berkeley Springs

BERKELEY SPRINGS, WV —

The Berkeley Springs International Water Tasting, the world’s most prestigious, gave out awards to waters from three continents.

Municipal water winners included a best in the world and a best in the USA. Clearbrook, British Columbia, Canada, added a new gold to its multiple medals as Best Water in the World. The gold medal for Best in the USA went to Eldorado Springs, Colorado, their first gold. The first-ever municipal water entered from Australia won the silver for Marysville in Victoria province. Independence, MO, won the bronze. California waters finished off the top five with Santa Ana winning fourth and Mission Springs Water District, Desert Hot Springs placing fifth. All three had ranked or won medals in past contests.

“The consistency in winners from year to year with different panels of judges validates the choices,” remarked perennial watermaster, Arthur von Wiesenberger. “It also speaks to the impressively high caliber of the waters entered.”

The bronze winner was another Bosnian water, Celvick Dobri Kiseljak, Tesanj. There was a three way tie for 4th: Oro Luxury Water, Vizianius, Macedonia, Nakd Luxury Sparkling Water, Putaruru, New Zealand and Deluge Sparkling Natural Spring Water, Oro-Medonte, ON, Canada.

Purified waters are a relatively new addition to the water world, often municipal systems bottling their water. The gold medal went to Bar H2O, of Richmond, MI, which was a silver medalist in 2015. New this year was the silver medalist, Divinia, Idaho Falls, ID. The bronze went to Hamilton On Tap, Hamilton, OH which holds three previous golds in the municipal division. Fourth and fifth place winners bottle famous Berkeley Springs water with Mountain Drop, Linthicum, MD placing fourth and Berkeley Springs Purified Water, Berkeley Springs, WV.

“The consistency in winners from year to year with different panels of judges validates the choices,” remarked perennial watermaster, Arthur von Wiesenberger. “It also speaks to the impressively high caliber of the waters entered.”

The room went wild when the Best Bottled Water was announced because Theoni Natural Mineral Water of Greece was present winning over 27 other entries. This event marked Theoni’s launch in the US market. Canadian waters won silver, bronze and 4th place: Prairie Crystal Pure Spring Water, Marchand MB, Eau De Source 83 ppm, Village Blanchard, NB, and Davia Organic Maple Sap Water, Saint-Quentin, NB respectively. Antipodes, Whakatane, New Zealand placed 5th.

The audience was filled with water enthusiasts coming from as far as Canada and California. Ten media judges spent hours tasting and selecting from waters sourced in 18 states, seven Canadian provinces and 5 foreign countries. “There were waters from Macedonia, Greece, France and four from New Zealand” said Jeanne Mozier, an event founder.

Sparkling waters are sourced from five countries. The best sparkling water in the world is Tesanski Kiseljak, Tesanj, Bosnia. The silver medal went to Touch Sparkling Mineral Water, Marchand, MB. The copper medal went to Natural Spring Water, New Zealand. California waters finished off the top five with Santa Ana finishing fourth and Mission Springs Water District, Desert Hot Springs placing fifth. All three had ranked or won medals in past contests.

“The consistency in winners from year to year with different panels of judges validates the choices,” remarked perennial watermaster, Arthur von Wiesenberger. “It also speaks to the impressively high caliber of the waters entered.”

The crown was interested in the peoples’ choice packaging competition where it was their votes that chose which of the seven entrants was the most alluring. They voted the gold by an overwhelming margin to Nakd Luxury Artesian Water, Bay of Plenty, New Zealand. A New Zealand water, Antipodes of Whakatane also won the silver. Third place was Jackson Springs Natural Premium Spring Water, Middlebro, MB, Canada sporting on the label their past gold medal for best bottled water.

Conclusion of the daylong water tasting is the famed “water rush” where the audience is invited to take home hundreds of bottles of water sent as part of the judging. “I spent about six hours arranging all the waters in a display,” said Mozier. “The crowd spent less than ten minutes making it all disappear. It’s like a Tibetan sand mandala,” she laughed. “I was pleased to see our favorite couple from Brooklyn in the rush. Peter and Cynthia Lloyd come every year especially for the water tasting – and the rush.”
The ten media judges selected by Klein Rone included representatives from various regional and national media including television and online magazines. They were instructed by von Wiessenberger to look, sniff and taste each water under guidelines similar to those in a wine tasting. The waters were rated for each attribute including appearance (it should be clear – or slightly opaque for glacial waters), aroma (there should be none), taste (it should taste clean), mouth feel (it should feel light), aftertaste (it should leave you thirsty for more). Waters were tasted in four separate flights over two days.

“The judges job is crucial and so is their training,” said Mozier. “We wanted to acknowledge this and developed the Certified Water Taster designation presenting all our judges with diplomas.”

The 27th annual Berkeley Springs International Water Tasting is scheduled for Saturday, February 25, 2017. The event was live streamed for the first time using new technology from Comcast operated by the Morgan Arts Council’s Digital Media Center. It can be seen on www.berkeleysprings.com. For more information on Berkeley Springs or its water tasting, call 1-800-447-8797 or check the website.

**BEST MUNICIPAL WATER 2016**

1st – Clearbrook, Abbotsford, BC, Canada (Best in the World)
1st in US – Eldorado Springs, CO (Best in US)
2nd – Marysville, Victoria, Australia
3rd – Independence, MO
4th – Santa Ana, CA
5th – Mission Springs Water District, Desert Hot Springs, CA

**BEST BOTTLED WATER 2016**

1st – Theoni Natural Mineral Water, Karditsa, Greece
2nd – Prairie Crystal Pure Spring Water, Marchand MB, Canada
3rd – Eau De Source 83 ppm, Village Blanchard, NB, Canada
4th – Davia Organic Maple Sap Water, Saint-Quentin, NB, Canada
5th – Antipodes, Whakatane, New Zealand

**BEST SPARKLING – 2016**

1st – Tesanjski Kiseljak, Tesanj, Bosnia
2nd – Touch Sparkling Mineral Water, Marchand, MB, Canada
3rd – Celvick Dobri Kiseljak, Tesanj, Bosnia
3 way tie for 4th
– Oro Luxury Water, Vizianius, Macedonia
– Nakd Luxury Sparkling Water, Putaruru, New Zealand
– Deluge Sparkling Natural Spring Water, Oro-Medonte, ON, Canada

**BEST PURIFIED DRINKING WATER – 2016**

1st – Bar H2O, Richmond, MI
2nd – Divinia, Idaho Falls, ID
3rd – Hamilton On Tap, Hamilton, OH
4th – Mountain Drop, Linthicum, MD bottling famous Berkeley Springs water.
5th – Berkeley Springs Purified Water, Berkeley Springs, WV

**BEST PACKAGING — 2016**

1st – Nakd Luxury Artesian Water, Bay of Plenty, New Zealand
2nd – Antipodes, Whakatane, New Zealand
3rd – Jackson Springs Natural Premium Spring Water, Middlebro, MB, Canada
B&N Appoints Mark Hutson to Great Lakes Division Director

Burgess & Niple (B&N), is pleased to announce the appointment of Mark Hutson, PE, to Great Lakes Division Director. In this position, Mark is responsible for operation of the firm’s offices in Akron and Painesville, Ohio. Mark joined B&N in 1998 and has served as the Great Lakes Utility Infrastructure Director since 2007. Prior to that, he was the Utility Infrastructure Section Director in B&N’s Painesville office.

Mark attended the University of Akron where he earned a Bachelor of Science in Civil Engineering. He is a registered Professional Engineer and an active member of the American Water Works Association.

Joe Bates Attended Membership Summit

Joe Bates attended the AWWA Headquarters Membership Summit in Denver, Colorado January 27-29, 2016. He returned with a check

Robert Eagleton Passed 8/27/45-1/3/16

Robert L. Eagleton, 70, passed away on Sunday January 3 in St. Elizabeth Health Center. Bob was born, Aug. 27, 1945, in Salem, the son of Jerome and Bertha Hannah Pemberton Eagleton. Bob was a 1963 graduate of Salem High School and received his Bachelor of Science in Engineering from Youngstown State University in 1968. Bob joined the Mahoning Valley Sanitary District Water Department as a Civil Engineer in 1968. In 1985, Bob accepted a position with the Cleveland Water Department where he retired in 2003. He was a member of the AWWA where he served as Secretary Treasurer for several years.

Bob leaves his wife, the former Stephanie, whom he married Nov. 27, 1969; two sons, Jeffrey (Marti) of North Ridgefield and James (Kathy) of Willoughby Hills; and one brother, Gary (Cynthia) Eagleton of Salem.
for $1617.00 from AWWA to the Ohio Section. The check was given to the Ohio Section for meeting its goal of 62% retention of new members in 2015. Joe Bates is on the Ohio AWWA membership committee and has been a member of AWWA for 10 years. He is the Water Treatment Plant Supervisor for the City of Xenia, Ohio, and has over 22 years of experience in both Water and Wastewater Treatment. Joe has worked for a number of communities in southwest Ohio including the City of Springboro, Franklin, Montgomery County and the Village of Yellow Springs. “Attending this Summit was a great privilege. Not only did I get to tour the AWWA headquarters in Denver, but I also got to meet many other water professionals and other AWWA members from Canada, Mexico and all over the US. You can never get enough of the Rocky Mountains!” said Joe.

Crown Water Treatment Plant One of Only 15 Honored with National Award

In 2015, Cleveland Water’s Crown Water Treatment Plant received the prestigious Phase IV “Excellence in Water Treatment” award from the Partnership for Safe Water Treatment Plant Optimization Program. The Crown Water Treatment Plant is the program’s 15th recipient of this award across North America.

Phase IV represents the highest possible level of performance that can be achieved in the four-phase Partnership for Safe Water program. Crown was honored for excellent performance in surpassing the required federal standards for water quality. Cleveland Water has participated in the of Cleveland Water Alex Margevicius.

The Partnership for Safe Water is a voluntary self-assessment and optimization program for water treatment plants and distribution system operations. More than 240 utility subscribers, collectively serving millions of people, are committed to the Partnership’s goal of providing safe, high-quality drinking water through achieving operational excellence in water treatment. Partnership members participate in a rigorous four-phase self-assessment and peer review process, developed by industry experts, and are recognized publicly for their commitment to delivering safe water to their communities. Special thanks to the entire staff at Crown Water Treatment Plant for their hard work in achieving this recognition:


EMH&T CELEBRATES NINE DECADES OF CLIENT SERVICE

COLUMBUS, OH – EMH&T is proud to announce its ninetieth year of providing professional design services to our valued clients throughout the Midwest and the Southeast. “EMH&T’s perspective is seasoned with the experience of the many professionals that have contributed to the success of the company over the past 90 years,” says EMH&T President Sandy Doyle-Ahern. “It means that our clients can trust the rock-solid foundation that has made EMH&T one of the most successful and well-respected firms in the region.”

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ANNOUNCEMENTS

The firm's foundation started with survey services in 1926, and then in 1954 the firm expanded with additional partners and capabilities completing the transformation to Evans, Mechwart, Hambleton & Tilton, today known as EMH&T.

As the firm continued to grow beyond survey and site engineering, it added a range of new disciplines, including planning and landscape architecture, transportation engineering, environmental and cultural resources, urban design, geographic information systems, construction services, and railroad engineering to meet the multifaceted needs of a growing client base.

Today, EMH&T offers this comprehensive array of disciplines to address the full range of project needs, from concept through construction. The firm's more than 350 professionals and technical personnel include civil, public works, transportation and water resource engineers, surveyors, construction managers, environmental scientists, GIS specialists, and land planners representing 16 core disciplines.

The firm will celebrate this milestone anniversary throughout 2016. “We are planning a variety of activities to commemorate this special year in the firm's history,” says Sandy, “and we all look forward to many more years of outstanding service to our valued clients, new and old.”

As part of the anniversary celebration, the firm has re-designed its company website to better reflect the people, projects, and culture of EMH&T. The new website will be launched as the kick-off event of the firm's various anniversary activities.

T&M ASSOCIATES APPOINTS DR. STEVEN XIAO

MIDDLETOWN, NJ – Dr. Steven Xiao, PhD, PE, has joined T&M Associates, expanding the firm's specialized technical capabilities for treatment of municipal and industrial water and wastewater. Dr. Xiao, a well-respected industry leader, brings national and international experience in process design, operation and optimization within both private and public sectors. His specialized expertise adds a new dimension to T&M's water resources practice and will serve both regional and national clientele from T&M's Cleveland, OH office.

“Dr. Xiao's deep understanding of emerging technologies and knowledge of process design will benefit the most complex water and wastewater treatment challenges our clients face,” said Ihsan Al-Fayyomi, T&M's senior vice president and environmental services practice leader. “By adding a recognized technical leader of this caliber, our clients will be able to access a comprehensive range of efficient solutions as they look to address aging infrastructure and ever tightening regulatory requirements.”

Dr. Xiao holds three degrees in Environmental Engineering: a BS from Southeast University in Nanjing, China, a MSE from Johns Hopkins University, and a PhD from the University of Central Florida. Prior to joining T&M, he spent six years at China Yida Holding, managing projects and designs at water treatment plants and facilities in China. Before China Yida Holding, he worked at Brown and Caldwell and GAI Consultants. Dr. Xiao is a registered professional engineer in multiple states.

T&M employs a team of 400 business and technical professionals and operates from 19 office locations throughout Delaware, Indiana, Kentucky, Massachusetts, Michigan, New Jersey, Pennsylvania and Ohio.
American Water Works Association

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3 Ways to Join

1. Apply online at www.awwa.org/join
2. Fax completed application to 303.347.0804
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By joining AWWA, you grant the association, through implied consent, authorization to send you commercial electronic messages. Your communication preferences can be updated at any time at www.awwa.org under “My Account.”

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