Ohio Water Environment Association Volume 89:4 | Issue 4 2016

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WEFTEC 2016

Ohio Ops Challenge Teams **Read More Inside** pg. 24-25

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What's Inside

Disclaimer

The Buckeye Bulletin (BB) is the official publication of the Ohio Water Environment Association, Inc., a not-for-profit corporation founded in 1926, dedicated to the improvement of water quality in Ohio and the continuing education of water professionals. It is one of the top five member associations of the Water Environment Federation.

The ideas, opinions, concepts, and procedures expressed in this publication are those of the individual authors and not necessarily those of the Ohio Water Environment Association, its officers, general membership, or staff.

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Get Involved - Join a Committee Today

The Ohio Water Environment Association has 25 committees which focus on various aspects of the water quality field and association operations.

Contact OWEA at **info@ohiowea.org** or the chair of a committee that interests you for more information.

OWEA NEWS

OWEA is looking for a designer for our new logo! Details on the Logo Design Competition can be found on page 10. Top designs will be published in the February 2017 issue of the Buckeye Bulletin and we will have the membership vote on their favorite.

Find OWEA on your favorite social network



Are you a social media guru? Find out how you can become part of OWEA's social media team. Email us at *info@ohiowea.org*

OWEA Calendar

November

- 10 OWEA Watershed Workshop
- 15 NW Section Lagoon Training
- 16 Executive Committee Meeting
- 17 NW/NE LAC Training
- 17 SE Collection Systems Hands-On Workshop
- 17 SW Plant Ops Seminar

December

- 1 OWEA Biosolids Workshop
- 1 NE Collection Systems Hands-On Workshop
- 8 NW Collection Systems Hands-On Workshop

January

- 11 Executive Committee Meeting
- 17 NE Operations Seminar
- 26 SW Industrial Waste Seminar

Welcome New Members

July 2016-September 2016

Mohamed Abed Alison Allwes Amit Bathija Hudda Bryant Kasey Carlisle Ben Champagne Christine Chen Marill Clay Bradley Crim Steve Eberts Adrian Eriksen Alison Gale Natalie Gase Mehmet Gencer Grace Halter Sarah Hunt Donna Hyland Robert Jambor Tracy Jones Ritesh Kalbande Eugene J. Leson Dave Mathews Bryant McDonnell Rishi Mehta Josh Melegari Kelly Messer Travis O'Leary Akul Rajan Joseph Sicurezza Kale Suedkamp Russell Thompson Daniel Valek Ben Vandermeyden Craig Voros Sylvie Wilson Steven Wise Carl Wootten Derek Wootten Suo Xiao

Thank you for joining the Ohio Water Environment Association and the Water Environment Federation. We welcome your contribution to preserving and enhancing Ohio's water quality environment.

PRESIDENT'S **M**ESSAGE

To the members of the Ohio Water Environment Association, I hope that when this issue reaches you that everybody is enjoying another wonderful fall in Ohio. By now those of you with families are back into the groove of school, taking the kids to the five different things they have to do all at the same time. I would say that I miss those days, and although I miss the kids being that age, I really do not miss those days.

In August the Executive Committee had a two day retreat to advance our strategic plan from two years ago and to discuss the organization moving forward. OWEA as a



Ted Baker OWEA President

whole does a fairly good job educating their members but the fact is we could be doing a lot more. We are currently working on several classroom style training sessions that will help our membership better prepare for and pass their state exams. Our goal is to roll these two to four week classes out in 2017 so keep your eyes open.

We also spent a great deal of time talking about the committees that OWEA has and how to make them stronger. The Executive Committee was split into four groups each responsible for five committees. The plan is to update or create policy and procedures for each committee and to draw up a real plan from an activity and budget perspective. This will better allow for new members that would like to volunteer time to better understand each committee's role. Along those lines, I would ask anybody

Ted Baker is currently the owner of Baker & Associates, a manufacturers' rep firm in the state of Ohio, where he has worked for the past 26 years. He is a member of the Select Society of Sanitary Sludge Shovelers (5S) and a recipient of the Keith Riley Outstanding Supporter award. He has a Bachelor of Science degree in Economics from The University of North Carolina, Greensboro.

Ted resides in Munroe Falls, Ohio with his wife Mary. They have two children, one daughter, age 22, a recent graduate of American University and one son, age 20, a Junior at Xavier University. Ted is an avid golfer and geocacher and he and his wife love to travel, especially to Walt Disney World in Orlando, Florida. that wants to become involved to please reach out to either myself or the OWEA staff. We need to infuse new people and new ideas into many of our committees and we can't do that without you.

If you are unable to commit time to a state committee but want to be involved, please reach out to your section executive committees. Ohio, unlike many other member associations, has four very strong and very involved sections. They offer the opportunity for local and valuable training for operators that have a difficult time traveling. But like the state they run entirely

on volunteers so please consider reaching out to them as well. It is where every single one of us at the state level got our start.

Perhaps the most important thing any member can do is introduce our organization to a new member. I have always hated that we harp on membership "numbers" but as your president I would like to share with each of you why it is actually important to the state of Ohio. This magic number has always been 2,000 members and Ohio is one of only five member associations that meets that criteria. Because of this we are afforded an extra voice at WEF in the form of three delegates, many MA's only have one delegate, a few have two, but only five MA's have three. This means that our state's voice can be heard in more places as we have more WEF committees and work groups with Ohio representation.

One of the other benefits to having three delegates is that each MA is allowed to send one Ops Challenge team for each delegate. This means we once again had three teams representing our state this year in the national competition. Although my schedule was extra crazy this year at WEFTEC, I made sure that I got over to watch each team participate in at least one event. I can't tell

2016 - 2017 Executive Committee Meeting Dates

November 16, 2016	OWEA Office
January 11, 2017	OWEA Office
February 8, 2017	OWEA Office
March 8, 2017	OWEA Office
May 10, 2017	OWEA Office
June 25, 2017	Hyatt Regency – Cincinnati, OH

you how proud I was watching all of them!! This year Ohio was represented by Northwest Water & Sewer, the City of Columbus and the NEORSD. To all of you, thank you for your dedication to this event. I had a great time visiting with each of you and can't wait to watch you compete again next year!!! Keep Practicing!!!

In my first President's Message I talked about members that are part of the history of this organization. I got a lot of great comments from people after the Buckeye Bulletin came out, but what I am hoping to see now is action. By the time this reaches you our Plant Ops/Laboratory workshop will have taken place. But the Watershed workshop should be right around the corner on the 10th of November and the Biosolids workshop will take place on December 1st. My hope is to see many new faces participating and that the managers reading this encourage just one new person to attend an event.

Finally I want to take this opportunity to wish each and every one of you a joyous holiday season. No matter what your faith is, it is that time of year that we surround ourselves with family and friends. There are times it



feels like a chore, that is true, but remember life is never planned or perfect, in fact it's the curve balls that make us all stronger. One day we will wake up and some of those family members and friends will be gone and you will wonder why you didn't spend just one more holiday with them, even if it was a chore.

The New Year and 2017 is right around the corner and because of the fabulous sponsors we have OWEA has plans to introduce many new things in 2017 and 2018. This Executive Committee is striving at every turn to make us more relevant to the general public and to make the education and training each of you needs more readily available. My promise to you as president is that we will continue to do this in the most affordable way possible.

Remember this final thought:

The only person any of us needs to be better than is the one we were yesterday.

Ted Baker OWEA President

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KOCAREK KORNER

The Need to Dream

by Dale E. Kocarek, PE, BCEE, Past President 2010-2011

Why We Dream

Sleep based dreaming has fascinated human kind for millennia. Some believe that it is a way to reconcile internal conflicts within our lives. Others believe that it is a doorway to the great beyond, while some believe that dreams predict the future. Modern scientists agree that sleep and dreaming is a vital component of a normal neurological recuperative process essential to health and wellness.



Sigmund Freud

Perhaps the greatest and earliest insights into the dreaming process are attributable to Sigmund Freud, the Czech born Austrian Psychiatrist (1856-1939). Throughout his long career beginning in Austria and ending in London in the 1930s, Freud was keenlv interested in the unconscious mind and the dreaming process. In 1923, this led to the introduction of the terms Id, Ego, Super and Ego.

which was considered a revolutionary breakthrough to explain the complexities of the conscious and unconscious mind. This helped form the basis of the modern field of psychology.

Types of Dreams

While I profess no background in psychology, I believe that dreams can be separated into three types:

 ${\ensuremath{\bullet}}$ Nocturnal based dreams, which were the focus of Freud

- Fanciful dreams, which may be called "daydreams"
- Thinking of possibilities, popularized by the



Ball field from the movie "Field of Dreams"

Reverend Norman Vincent Peale (1898-1993) in his book "The Power of Positive Thinking."

As we age, it appears that our ability to dream becomes less and less. The process becomes squelched or extinguished to the pressures and pace of life. Then at certain points, we make excuses such as "I am too old," or "I don't have enough time."

As people of science, we are taught to be grounded in reality and develop a logic and fact based thinking. Movies like "Field of Dreams" portray dreaming in fanciful context. An Iowa farmer and former baseball enthusiast building risked bankruptcy in pursuit of a dream.

But does this mean that dreams are not important?

Dreams that Shape Our Future

In the metaphysical sense, I believe that dreaming is important to provide context, meaning and direction to our lives. Sometimes, we need to create time to think creatively

and "make things happen" as a master plan for one's life. We are often told to "think big." I am reminded of a quote from the Irish Born Playwright George Bernard Shaw (1856-1950):

"You see things; and you say Why?' But I dream things that never were; and I say Why not?"

George Bernard Shaw was an activist and critic of the social, economic and cultural divisions in Great Britain in the early 20th Century. His most famous play was



George Bernard Shaw

Pygmalion, written in 1912, which was centered on the class divisions in Great Britain at that time. Pygmalion became popularized in the movie musical My Fair Lady in 1964, starring Audrey Hepburn and Rex Harrison.

What Role Should OWEA Play?

I recently attended a retreat of the OWEA Executive Committee at the Mohican State Park. It was a two day event led by President Ted Baker. The theme was a strategic look back over the last two years – since our last retreat – and then pragmatic look into the future.

I found our retreat interesting and productive, and I would encourage our sections to do something similar. The benefit of going to a different place to think helps stir creative juices of planning and dreaming. The retreat also allowed our current board to get to know each other better and bond with new board members. In addition to the

KOCAREK KORNER

pleasant surroundings, the thing that impressed me most was the positive energy in the air and the diversity of our Board. We had representatives of three generations with a common bond of OWEA and enhancing and protecting the water environment.

I have known Ted Baker for the last 15 years. Since that time. I saw him advance through the chairs of the Northeast Section to become the President of OWEA. During our retreat, Ted mentioned that one of his dreams is to become WEF President. While the role to becoming a WEF President requires years of work within the WEF Community, it is good to hear someone in our ranks express this interest.

Dreams for All Generations

I believe that our organization can offer something of value for each generation. As someone that is older, I appreciate that we must learn from our past, but not be afraid to reinvent ourselves for the future.

Jonah Goldberg, a syndicated columnist, in his article in the Columbus Dispatch of October 8, 2016 wrote a piece titled: Millennials Favor Clinton, But Will They Vote? Here, Goldberg stated the following, "It is silly to talk about millenials as a homogenous group, not just racially, but in most things." Sure some generalizations are possible about a cohort that grew up with the internet versus one that didn't. Based on discussions that I heard at our



retreat and at WEFTEC this year is that in addition to being bright and motivated, millenials want to see the value in something for themselves. Like many of us, they wish to be part of meaningful activities and do things that have impact.

As a member of the WEF House of Delegates, I had the privilege of participating in the construction of a rain garden service project in front of the New Orleans City Hall. It was 90 degrees and very humid, and I enjoyed it immensely, in part because I like planting things. The excitement and energy of the event filled the air. This was as good and worthy of a cause as I have been part of in my volunteer life.

In Closing

I believe that one of OWEA's strengths is our diversity. We must learn from each other and respect those that came before. In addition, we must appreciate and encourage those younger than us to dream.

I wish to close by again quoting George Bernard Shaw, "Life is not about finding yourself. Life is about creating yourself."

We have the responsibility to be proactive and dream. I believe that OWEA has a responsibility for those entering our organization to help them create themselves and fulfill their dreams.



Dale Kocarek and other volunteers from the WEF Service Project. Photos courtesy of Water Environment Federation.



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Mew & Amproved go Design Contest

OWEA is looking for a new visual identity and needs your help. We are seeking ideas for a modern, creative, innovative and professional logo design that will help identify and define our organization for the next decade.

The logo should be recognizable and be consistent with OWEA's mission, "To Educate our members through sharing information and networking, educate the public on preserving and enhancing our water quality, be proactive on water environment issues and build a positive professional image within and outside the Association."

Please read below for more details regarding logo design, contest rules & submission requirements.

How to Enter the Contest

Submissions will be accepted from Monday, November 28, 2016 through December 30, 2016. In order for your entry to be submitted and reviewed by our judges (OWEA Executive Committee and Staff), all entries must be: Submitted through the online contest form at: http://ohiowea.org/owea_logo_design_contest.php Submitted in their original source file and

Submitted as a high resolution .pdf with 300 dpi or higher.

The top four entries will be presented to the entire OWEA membership for voting. The logo that receives the largest number of votes will become our new logo.

Finalists and winners will be announced via the OWEA website, social media, and direct contact via email.

Logo Requirements

Professional: This logo will be featured on our website, our social media platforms and other mediums (stationary, pamphlets, t-shirts etc). As a result, while we want the logo to be eye-catching, it must be legible in a variety of sizes and formats.

Theme: Logo must be consistent with and promote the mission of the Ohio Water Environment Association.

Color: There are no limitations and any colors may be used. However, logo must look good in color (if any) or black and white. If your design is chosen, you will be required to relinquish all rights to the logo to OWEA. The logo may be changed / modified by OWEA for permanent use at the discretion of OWEA.

Integrity: Logos cannot contain copyrighted material. Logos must have been created and edited by the contestant(s). Logos may not include images or licensed images that have been previously published unless permission is given. Must be easily reproducible and scalable for large and small formatting and also allowing color change if necessary.

Prize

Contest finalists will receive a \$50 Amazon Gift Card and the final winner will receive a \$250 Amazon Gift Card (and bragging rights!).

If you would like access to our current logo graphics, please contact Megan Borror at *meganborror@ohiowea.org.*

NOTE: OWEA reserves the right to not select finalists / final logo and to retain our current logo, depending on numbers and quality of submissions.



WEF Delegates' Report



Dale Kocarek

The annual WEF House of Delegates (HOD) meeting was held on Saturday September 24, 2016 in New Orleans, LA (NOLA). WEFTEC is the only time during the year where members from the HOD convene. I believe that the furthest distance traveled was New Zealand. This year marked the end of my first term as a member on the HOD, and after this article I am no longer the senior WEF Delegate from Ohio. That honor now falls to Tom Angelo. I am now the "junior" delegate again.

The morning agenda consisted of a formal meeting led by the Speaker of the House, which was Jamie Eichenberger. At the end of the day, there was a transition to a new speaker, and this year it was Howard Carter of Sago, Maine where he is the Water Resource Recovery Department Director. I have worked with Howard before and am excited to see him take on the Speaker role. He is one of many fine leaders from the New England Water Environment Association.

In terms of Ohio, we have no changes in delegates this year. Your representatives on the WEF HOD are Tom Angelo, Tom Fishbaugh, and myself, Dale Kocarek. Given that we have been able to maintain



The Young Professionals Service Project at WEFTEC.



Tom Angelo

WEF membership over 2,000, we are entitled to three WEF Delegates. For most of our existence, Ohio has had two.

The HOD is the policy advisor for WEF. HOD Committees tend to be fixed and continue every year. They handle the majority of business associated with the HOD and report to the Board of Trustees. Work groups typically have a lifespan of one to two years and are chosen to address key issues/hot topics of concern for WEF. Once in a while, a work group is determined to be so important that it is promoted to a standing committee.

As I have noted in the past, HOD has five standing committees: Steering, Budget, Outreach, WEFMAX, and Nominating. I am on the Steering Committee, Tom Angelo is on the WEFMAX Committee, and Tom Fishbaugh is on the Outreach Committee.

The most "technical" committees are probably the Steering and Budget Committees as they pertain to the inner workings of WEF and have a direct link to the Board of Trustees (BOT). The WEFMAX and Outreach Committees primarily focus on the Member Associations such as OWEA. The Nominating Committee's sole role is to continue to find the best fit for volunteers on the five standing committees. I was on that committee last year.

Many of our members probably know most about WEFMAX as we often talk about it. This coming year, we have a WEFMAX in Cincinnati, Ohio on April 26-28, 201. I encourage anyone in section or committee leadership to attend as it gives unprecedented access to WEF staff and the inner workings of this fascinating organization. WEFMAX meetings are rotated around the



Tom Fishbaugh

United States and Canada, with three typically in the US and one in Canada.

The WEF HOD also has a number of workgroups. This year we have three: Strategic Planning, Public Communications, and Membership. Workgroups have one or two assignments to complete in the year and then end. The Public Communications workgroup, which I am on, is a continuation of the Voice of Water, and the Water Advocates, which is connected to the WEF Government Affairs Committee.

One of the most valuable outcomes of the workgroups has been the Outreach Committee, which started out as the MA Leadership Workgroup. This group is focused solely on member associations and was sorely needed. The Outreach committee is not a public voice-point of interface between MAs and WEF. They are in the process or organizing a lot of useful information, which will benefit MAs in the future – almost anything from "soup to nuts." This information will be housed under the WEFCOM community.

One of the most interesting things about the day was our participation in the Young Professionals Service Project at City Hall in NOLA. We went at the noon hour when the temperature was in the 90s and the humidity could not have been higher. But with all of this being said, this was my highpoint at WEFTEC!

Interested in joining a WEF Committee? Does travel make you hesitant to join? Goodbye hesitation as many meetings are held over the phone. Go to http://wef.org/committees for more information.



NWOWEA Jeff Thompson, President

Greetings from the Northwest Section!

As I sit at my office desk pondering all of my presidential duties and wondering if I have remembered everything that needs to be done, a reminder email pops up in regards to the section Buckeye Bulletin update deadline. The angle of the sun as it sinks lower in the hemisphere, positions the sun in my face and puts a blinding glare on my computer screen. It's my yearly sign that winter is approaching! Winter can be especially challenging for OWEA Members. Preparation for freezing weather is starting to take place. Over the years each facility has learned to deal with the challenges of changing season and the effects from it. Operator, maintenance personnel, and managers often have to come up with solutions to problems not covered in a S.O.P. or maintenance manual. Whether it be solving an icing problem on equipment in the winter, to trying to put grease in a zerk you can't see. With all of the great solutions out there to solve a problem, we at the Northwest Section want anyone that has a story to share it.

On a nationwide basis, WEF has the "operator ingenuity" award. The Northwest Section wants to reward individuals by offering paid section meeting fees (4) and one ops workshop fee, including one night hotel for one winner. We plan on making this an ongoing event and picking winners a couple of weeks before each meeting. Anyone with an "O & M idea/tools/practices" story can contact a Northwest Executive member. If the individual doesn't want to do the story/write-up, an Executive Committee member will do it and submit it. As we receive submittals, the Executive Committee will send the article for publication in the Buckeye Bulletin. Our intention is to recognize the ingenuity of people in our industry and maybe help with a problem someone on the faculty may have. No idea, tool, or practice is too small or insignificant. In that respect, I challenge the other sections. Let's see what's out there! Hopefully next year, Ohio will be sending someone to WEFTEC to receive the Operator Ingenuity Award!

The Executive Committee has also discussed a focus on small communities and how to get them involved and to attend meetings. We have discussed some challenges that small systems face. Amongst these are time, travel, funds, awareness and management/council cooperation.

We are in the process of investigating the option of holding regular small systems meetings county by county that require minimal travel, short time frame one to two hours and are free or minimal cost. We are hoping to have a county representative that will keep in contact with the small communities and the Executive Committee small systems chair. We in turn would find presenters and a regular in county meeting place.

If anyone has additional ideas please contact an Executive Committee member or if you know someone within the individual counties of the Northwest Section that would want to participate, please let us know. Hopefully, we will soon put the idea in motion to get the small systems involved!

The Northwest section has openings for two section committee chairs, one for the Young Professionals chair and one for the Watershed chair. If you are interested or know of anyone that would want to fill these committee positions please contact any NW EC member.

Past President Roberta Acosta [Streiffert] is working on organizing a Past Presidents event/get together. She will contact all of the NW section past presidents when plans are finalized. Roberta seems to be *REALLY* enjoying the role of Past President. The smile on her face proves it.

As provided by Terry, thanks Terry, Tony Hintze and Terri Brenner, co-chairs for the NW OWEA Lab Analysts Committee, have been working on a way to get more interactive with our members and we have decided to start our own group on Facebook. Unlike a Facebook page that you "Like" and have very little interaction with, when you join the NWOWEA Lab Analysts Committee group you will be able to post questions, articles, and join in on discussions. We will be able to come together, help our peers, and share ideas. This will be great for those of us that don't check our email on a regular basis as we will keep you informed on current topics, EPA regulation changes, and upcoming LAC meetings. This group is not just for the Lab Analysts. It is for all wastewater professionals, so be sure to share this and all Buckeye Bulletin readers can join us as well. We just got the group started and we are trying to get the word out. The group is for all wastewater professionals in Ohio not just Lab Analysts.

Please follow the link below and join us. Be sure to read the Welcome and Guidelines post that is pinned at the top of the Discussions page. If you are using a mobile device click the "View Pinned Post" tab just above where you would write a post. *https://www.facebook.com/groups/180998595649355/*

Hope to see you there!

I would like to thank everyone that helps make my presidential duties a lot easier. From vendors, engineers, operators, administrators to my NWOWEA and State OWEA Chairs and committee members. What a great group of people to know!

As a final note, please visit the OWEA website regularly for section meetings and various other workshops. I hope to see you at a meeting.

Jeff Thompson NWOWEA President jthompson@cityofstmarys.net



SWOWEA

Jason Tincu, President

As (finally) cooler temperatures grace our presence and Pumpkin Spice everything takes over the world, we reflect on another productive quarter in the SW Section. And in doing so, I'm reminded how well we work together: the Executive Committee, Committee Chairs and Co-Chairs, membership, and OWEA support staff. Being an old hack on the basketball court, one of the things that I tried (and still try to do when my body allows) is to make everyone better around me...leveraging their strengths and skills for the best interest of the team. This is also one of my goals as President of the SW section: to recognize and enhance the strength and skills of those around me and inspire them to contribute to the greater good of the organization! This methodology worked to make my team better and more successful in basketball (though leaving me only averaging around three points, four assists, and three rebounds per game). Why wouldn't it also be successful in the professional/SWOWEA world? We will soon see!

SWOWEA is very excited to announce that we set a record for section meeting attendance at 140 people with our recent event at the City of Middletown. Pictured is City Manager, Doug Adkins, who gave an excellent presentation on the state and vision for the City. SWOWEA would also like to thank Scott Tadych, Gerry Burris, and the City of Middletown staff for hosting the event. The SWOWEA would also like to thank the event sponsors: BL Anderson, Brown and Caldwell, Hazen, and HP Thompson. The event included a plant tour at Middletown's wastewater treatment facility as well as technical sessions and business meeting at the Middletown Moose Lodge.

SWOWEA also hosted the following events across the past few months.

July 21, 2016—LAC Summer Meeting at the City of Fairfield





Doug Adkins presenting at the section meeting at City of Middletown.

July 27, 2016—YP Plant Tour and Happy Hour at Montgomery County Environmental Services and Warped Wing Brewery (plug)

August 14, 2016—SWOWEA Family and Friends event at the Dayton Dragons

October 13, 2016—SW Fall Lab Analyst Committee event at YSI

We are super excited about our upcoming offerings including the Fall Op Ed Day (10/28), and our Plant Ops Seminar and Section Meeting in Mason (11/17). See the OWEA website for more details. In addition to this lineup, the SW is very excited about hosting next year's OWEA state conference in Cincinnati, **Rollin Down the River**. Planning is well underway for what will, no doubt, be an awesome event! Thanks to Conference Chairs, Sharon Vaughn of the City of Dayton and Marty Davidson of BL Anderson, for spearheading this charge!

As we plan to close out 2016 in a strong fashion and vault into 2017, I will continue to draw upon the talents around me to deliver quality services to our membership and also look to grow the future of SWOWEA. We are continually in search of support and new volunteers. So if you are interested in participating or happen to see a gap within our organization that you may be able to fill, please get ahold of us and we will "dish you the ball". Feel free to contact me directly with any comments, questions, gripes, or suggestions at:

jtincu@brwncald.com.



Section Reports





The Northeast Section has been very busy planning the fall and winter meetings. On September 22nd, we officially kicked off fall with tours of the New Waterford and East Palestine Water Reclamation Facilities. 85 members were in attendance. Some drove more than two hours to learn about wastewater treatment in these rural communities. This clearly demonstrates how valuable it is to our members to see different facilities, large or small and learn about the plant's operation. Thanks to Frank Daniels, John Jurjavcic, and their staff for making this such a successful event.

Next up was the annual clambake scheduled for October 8th at Grantwood Golf Course in Solon. This is always a great fall event to just relax and enjoy some really good food, fun and conversation. October 11th was the Young Professional's Akron Waterways Renewed Program Bus Tour. Brian Gresser, Water Reclamation Services Manager at the Akron Water Reclamation Facility took the group on a guided tour of four projects that are intended to control combined sewer overflows. October 19th was the Industrial Pretreatment Coordinators Workshop at the EPA Northeast District Office, Twinsburg. November 10th was the "Free" Supervisor's Seminar at the Furnace Run Pavilion in Richfield. This event provides topics for members involved in management and supervision. Preliminary plans are in the works for the 2017 Operations and Industrial Wastes Seminars on January 17th and February 16th respectively. Register for these popular events early because they typically reach capacity well before the registration deadline. Look for details in the December Sparkling Waters publication or on the NESOWEA website.

Every year the Executive Committee solicits nominations for WEF and OWEA State and Section awards to recognize members for their outstanding contributions to our industry and organization. We need your help to identify potential candidates. Please visit the NESOWEA website to review the award descriptions and to download nomination forms.

Lastly, I want to comment on the relevance and importance of public outreach. As we all know, the Baby Boomers and people that have been in the industry for many years are retiring at an alarming rate. It has become extremely difficult to fill these vacant positions. Why? Because we don't advertise very well. Our Past President, Tom Voldrich initiated the challenge last year for us to get involved in public outreach to educate the public about the significant role we play in protecting our water resources. Twenty years ago, people didn't want to talk about what we do. Today, it is significantly different.

The Young Professionals Group, chaired by Ashley Williston, has done a fantastic job interacting with student groups in our area. They have participated in beach cleanups, resumé reviews and manned OWEA information tables at school events. Through this interaction, students have attended OWEA meetings, written articles for the Buckeye Bulletin and participated in internship programs at various entities in our organization. The interest has been so overwhelming that there are more interns than we can accommodate. The next generation is genuinely concerned about the environment and what the future holds for their families. So to follow in the footsteps of our past president, I challenge you to get involved to help spread the word about careers in the water related professions.

If this sounds like something you would like to do, please contact Steve Baytos, Public Outreach Chair, at *Sbaytos@avonlakewater.org.* If you would like to volunteer for another committee, please contact any one of the Executive Committee or Committee Chair members. Committee functions and contact information can be found on the NESOWEA website under Committees.

Hope to see you soon. Paul J. Solanics

psolanics@solonohio.org



TOP: John Jurjavcic, Superintendent at the East Palestine Water Reclamation Facility BOTTOM: Tour of the New Waterford Water Reclamation Facility.

SECTION Reports SEOWEA 2016-2017 Sponsors



SEOWEA John Owen, President

The SEOWEA Executive Committee has been busy with activities and planning for the upcoming 2016-2017 events.

The first event for this year was the SEOWEA LAC meeting that was held on August 23rd at the City of Newark WWTP, with lunch being provided by Thomas Scientific. Big thanks to the City of Newark for hosting the meeting and to Melodi Clark for coordinating a SELAC meeting with a record 42 attendees! Following the LAC meeting, was our Section meeting held on October 20th and hosted by Delaware County. Another Big thanks to Mike Frommer and Tiffany Maag of Delaware County for hosting our fall meeting, as well as to all the presenters and attendees, for making it a success.

This year's Friends and Family night was with the Columbus Blue Jackets at Nationwide Arena on November 4th. Attendees got to experience an NHL hockey game in a festive and entertaining environment. This event followed last years' Columbus Crew event and two successful years with the Columbus Clippers. Southeast Section would like to thank our 2016-2017 sponsors for making this year's Friends and Family Night possible.

Looking ahead to 2017, the Southeast Exec. Committee has developed a tentative section meeting schedule, so mark your calendars. More details to follow:

February 9th	Industrial Treatment Meeting, Location TBD
April 13th	Plant Ops/Collections/Small Systems Training Tentatively planned for the West Jefferson WWTP
May 11th	Safety/Regulatory/Biosolids/ Awards/Officer Elections Location TBD

If you would be interested in hosting a section meeting or being involved in a committee function, please let myself or any of the Southeast Exec. Committee members know. We are always looking for new and exciting sites to visit. Furthermore, if you have interest in becoming more involved in a section committee or being a future member of the SE Executive Committee, let us know. There is substantial personal and professional growth one can gain from being involved in this great organization. Hope to see you at a function soon!

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Government & Regulatory Affairs Committee Update

by Dale Kocarek, P.E., Government and Regulatory Affairs Chair

Based on my recent trip to WEFTEC and learning about how WEF and other member associations organize their committees, I have decided to separate the Government and Regulatory Affairs Committee into five separate branches:

- Workshop,
- Legislative,
- Technical Review
- Fly In
- Sections

The **Workshop Group** has been led by John Owen for many years, and we have a good formula for success. As many of you know, we are combining our workshop, scheduled for March 9, 2017 with the Ohio AWWA. We have been coordinating with Stacia Eckenwiler of the Ohio AWWA and Laura Carter in workshop planning. Please be on the lookout for our "call for papers." The format for the workshop will include a joint session in the morning with two "break out" sessions in the afternoon – one will be focused primarily on wastewater topics, and the other on drinking water topics. As we have embraced a "One Water" culture, it only makes sense to join our organizations in this important area.

The **Legislative Group** will be where we follow proposed bills at the state and federal level. I am trying

to develop this function further, but progress has been slow.

The **Technical Review Group** was a big success for us in the past, and I wish to resurrect this important group with new people interested in rules review, mostly rules from the Ohio EPA. Over the past few years, many of our key reviewers have changed jobs and taken on new interests.

The **Fly in Group** will be closely aligned with the Legislative Group, and will likely change year to year based on schedules and personal interests. One thing I wish in the future is to take a more proactive follow-up when we return home. Given the importance of visiting our leaders in Washington and again at home, we have traditionally encouraged Senior Board members, along with current and Past Presidents to attend. One of most rewarding things was that a legislative aide for Representative Latta, contacted Doug Clark and toured Bowling Green.

The **Sections Group** (four in all) is something that I wish to encourage. I believe that this is a good opportunity for Young Professionals to test our committee and see if it is of interested for them. I will be proposing this to our President and Sections in the near future.

Is Your Membership Profile Up to Date?

Are you receiving your copy of the Buckeye Bulletin and timely email updates from the Ohio

Water Environment Association? Has your job or position changed?

You can update your information online at:

http://www.ohiowea.org/memberships.php



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COMMITTEE **R**EPORTS

Certification Committee

by Kathy Richards, Certification Chair

Certification Clarifications!

Hello all! There has been some confusion recently about the minimum requirements to sit for the Voluntary Wastewater Laboratory Analyst Certification examination. Please understand that these minimum qualifications are set nationally by the Association of Boards of Certification, in part to ensure consistency and also to help enable reciprocity should your career take you to another state (or even country).

EXPERIENCE MUST BE ACTUAL HANDS ON EXPERIENCE IN A WATER POLLUTION CONTROL/ WATER RECLAMATION LABORATORY!

Class	Education	Experience
Ι	High School or GED	1 Year - 2080 Hours
II	High School or GED	3 Years - 6240 Hours
III	High School + 900 Hrs. Training/Education	4 Years - 8320 Hours
IV	High School + 1800 Hrs. Training/Education	4 Years - 8320 Hours

Class I

- High school diploma, general equivalency diploma (GED), or equivalent and
- 1 year acceptable wastewater laboratory experience.

Note that no substitution for education or experience shall be permitted.

Class II

- High school diploma, GED, or equivalent and
- 3 years of acceptable wastewater laboratory experience.

Note that a maximum of 675 contact hours or 68 continuing education units (CEUs) or 68 quarter credits or 45 semester credits of post-high school education in the environmental control field, engineering, or related science may be substituted for 1.5 years of wastewater laboratory experience.

Class III

- High school diploma, GED, or equivalent and
- 4 years of acceptable wastewater laboratory experience and
- 900 contact hours or 90 CEUs or 90 quarter credit hours or 60 semester credits of post-high school education in the environmental control field, engineering, or related science.

Note that a maximum of 900 contact hours or 90 continuing education units (CEUs) or 90 quarter credits or 60 semester credits of post-high school education in the environmental control field, engineering, or related science may be substituted for 2 years of wastewater laboratory experience. A maximum of 1 year experience in a Class II or higher position may be substituted for 450 contact hours or 45 CEUs or 45 quarter credit hours or 30 semester hours of post-high school education in the environmental control field, engineering or related science.

Class IV

- High school diploma, GED, or equivalent and
- 4 years of acceptable wastewater laboratory experience and
- 1800 contact hours or 180 CEUs or 180 quarter credit hours or 120 semester credits of post-high school education in the environmental control field, engineering, or related science.

Note that a maximum of 900 contact hours or 90 continuing education units (CEUs) or 90 quarter credits or 60 semester credits of post-high school education in the environmental control field, engineering, or related science may be substituted for 2 years of wastewater laboratory experience. A maximum of 2 year experience in a Class III or higher position may be substituted for 900 contact hours or 90 CEUs or 90 quarter credit hours or 60 semester hours of post-high school education in the environmental control field, engineering or related science.

ADDITIONAL INFORMATION REGARDING EDUCATION & EXPERIENCE

- Education applied to the experience requirements shall not also be applied to the education requirements.
- Experience applied to the education requirements shall not also be applied to the experience requirements.
- Where applicable, related experience in operations, maintenance, other environmental control utility positions, and allied trades such as a hospital laboratory technician or other certification categories may be substituted for one-half of the experience requirement.

If you have any questions as to whether or not you qualify, please contact me <u>before</u> you apply and I will assess your eligibility.

Kathy Richards Director, OhioWEA Certification Board *certification@ohiowea.org*



Idioms: Can They Make You Safe? Safety Committee Update

by Michael Welke, City of Warren, Safety Committee Co-Chair

While thinking of what to write about for this issue I was walking around and heard someone say, "**There** is a method to my madness" which made me start to think about other idioms and how they could relate to safety.

Examples of these idioms are **Two hands are better than one**; **Let the cat out of the bag**, communicate with others, share ideas and thoughts. You might not see the danger that could be there but someone else might.

Cleanliness is next to godliness and An apple a day keeps the doctor away reminds me of hygiene and health safety. Curiosity killed the cat, Stop and smell the roses, and Patience is a virtue remind me of not rushing into things. Stop and take a step back and look over the situation and find the potential dangers.

Even though the task seems like **A piece of cake**, **Stop and smell the roses** to make sure you are **On the ball** to be safe.

It takes Two to tango, to See eye-to-eye, and

to understand the **Whole nine yards** of a situation.

Try not to **Beat around the bush** or wait to **Cross that bridge when you come to it** because you might **Cut corners** and **Bite off more than you can chew** and **Miss the boat** on safety.

While I hope this article **Cuts the mustard** and is **The best thing since sliced bread** to get you to **Think safety first**, **The ball is in your court** and this can be a **Blessing in disguise** if it gets you to be safe. Either way, it is always **Better to be safe than sorry**.

Nathan and myself would like to welcome two new members to the Safety Committee. Jerry Ondo from Madison WWTP will be representing the Northeast Section and Patricia Tebbe from OEPA will be representing the Northwest Section. Arriving in the mail soon are the Safety postcards. These are to remind you to submit your facility for a Safety Award.

Applications can be found at: *www.ohiowea.org/safety.php*

COMMITTEE CONTACT INFORMATION Safety Committee Co-Chair Safety Committee Co-Chair Mike Welke Nathan Coev City of Warren City of Pataskala mwelke@warren.org ncoey@ci.pataskala.oh.us YOUR WATER PROFESSIONALS. J. DWIGHT THOMPSON COMPANY Water & Wastewater Manufacturer's Representative DRINKING WATER Wells and Reservoirs, Treatment, Distribution • WASTEWATER MARC NUSSER **Collection and Treatment Systems** (513) 800-9009 - marc@jdtco.com • WET WEATHER MANAGEMENT GPD GROUP Stormwater, Watersheds, Green Control Measures 520 South Main Street, Suite 2531, Akron OH 44311 800.955.4731 PO BOX 505 - MIAMITOWN, OHIO 45041 (513) 871-9970 - FAX (513) 871-2270 - www.jdtco.com ARCHITECTS | ENGINEERS | PLANNERS Visit us on the web at www.gpdgroup.co

NE Section Students & Young Professionals Update

by Ashley Williston, NE YP Chair, Burgess & Niple

This last quarter, our NE Section YP group has held two popular events!

On August 17th, North East Ohio Regional Sewer District (NEORSD) hosted our YP event at their Westerly Facility. Doug Dietzel, a member our YP group, gave his presentation titled "Overflow Control Using Chemically Enhanced High Rate Treatment". The presentation explained the process of Chemically Enhanced High Rate Treatment, described the pilot designs at each of the Northeast Ohio Regional Sewer Districts Facilities and shared the data that was collected over the past three years. The purpose of the event was to have Doug practice his presentation with our group before presenting at WEFTEC. After the presentation, Doug led the group on a tour of the Westerly Plant. Since we were so close to Lake Erie, after the tour we went to the Whiskey Island Still & Eatery. We conversed over appetizers and got to see a great Lake Erie sunset.

On October 11th, the City of Akron hosted a Bus Tour of the Akron Waterways Renewed Program. Brian Gresser, Akron Water Reclamation Services Manager, joined our group to host a bus tour of several completed and ongoing construction projects initiated to control the City's combined sewer overflows and to update the City's sewer infrastructure. We started the meeting at the WRF Training Facility where Brian gave a presentation before loading onto a 30 passenger Presidential Coach bus that the Executive Committee rented for the event. After the event the group gathered at Winking Lizard in Peninsula. We usually have a few new YPs attend every event... even though there is a good core group that typically tries to come to everything. We had six new people at the last event – which was pretty exciting!

On November 15, 2016 from 4:00pm-6:00pm we will be having a Resume Review Event at Cleveland State University where our YP group will be meeting with CSU and Case Western Reserve college students reviewing resumes and answering questions.

To receive the NE YP emails to hear about our upcoming events and other YP information send me an email: *ashley.williston@burgessniple.com.*

Photo Collage of the NE Young Professionals event at the Westerly Facility.

Photo Collage of the NE Young Professionals bus tour of the Akron Waterways Renewed Program.

Lab Analysts Committee Update

by Denise Seman and Melodi Clark, Committee Co-Chairs

Happy fall everyone!

Hope everyone has had a great year so far....wow, has it gone fast! We're heading into the holiday season. The year will be gone before we know it.

The Plant Operations and Laboratory Analysis workshop was held October 26 & 27, such great topics presented again. For those of you that could make it, it was great seeing everyone! Those of you that didn't make it, we really missed you and hopefully we can see you at another event soon. I will be attempting to attend a section meeting in each section during 2017, since I am well aware that many people can't get out to the state meetings, and would like to be able to touch base with those that can't. (Denise)

If anyone would like to join the state committee, please let us know. We're always open to new members. If you have any topics you would like to have more training/ info on, please contact us. We'd like to be able to provide you with the topics you'd most like to see.

Hands on workshops are a hot topic, but we need to do a bit more research for holding them. Equipment availability and space will limit the number of people that can attend any session, as well as instructor availability.

SE LAC – Melodi Clark

I would like to give a huge thank you to the City of Newark and Nancy Taylor on hosting our Lab meeting. We had over 42 people attend!! Thomas Scientific sponsored our lunch once again so I would like to thank them for that. The tour of the plant was great. Amy Hursey from the City of Zanesville gave a wonderful presentation and I thank her for that. Our lab meetings keep growing which is awesome! I am still looking to hold a mega lab meeting here in Columbus towards the end of the year that would include all four sections. If you have a presentation that you would be willing to give please let me know. I am so happy to see our section meetings really start to increase in number. Let's keep up the great work and have even more people at our next meeting!

SW LAC - Karen Tenore and Jim Davis

Our Summer meeting was hosted by the City of Fairfield WWTP on July 21.

Topics presented were: Total Suspended Solids; Lab Analysis of Emerging Chemicals of Concern; Overview of Lab Pack Services; and Facility Tour.

COMMITTEE CONTACT INFORMATION NW Co-Chair Anthony Hintze (419) 334-3876 tjhintze@gmail.com **Co-State Chair** SW Co-Chair Denise Seman Karen Tenore **NW Co-Chair** (330) 742-8820 (937) 333-1501 Terri Brenner karen.tenore@cityofdayton.org DSeman@YoungstownOhio.gov (419) 872-8041 tbrenner@ci.perrysburg.oh.us SW Co-Chair **Co-State Chair & SE Chair NE Chair** Jim Davis Melodi Clark Bev Hoffman (937) 496-7051 (614) 645-1239 NESOWEALAC@gmail.com DavisJi@mcohio.org MLClark@columbus.gov Join Your Section's Lab Analysis Committee

Certified wastewater analysts are a valuable resource to the industry. Network with and learn from other certified wastewater analysts in your area. Learn how to become certified by contacting the LAC Chair in your section.

Our Fall meeting was October13, 2016, hosted by Yellow Springs Instruments.

Topics presented were: Streamlining Analytical Testing; Total Phosphorus & Dissolved Phosphorus Monitoring Study; Overview of Blueprint Columbus; Can small Plants Meet Revised Ammonia and Nitrogen Criteria; and Facility Tour.

Upcoming meetings for 2017 need to be determined. Check the OWEA and WAVE for dates.

To inquire about being added to our e-mail list or to get information about attending, hosting, sponsoring or presenting at a future LAC meeting, please contact:

Karen Tenore, City of Dayton WRF 937-333-1845, karen.tenore@daytonohio.gov

Jim Davis, Montgomery County Water Services 937-496-7051, *davisji@mcohio.org*

Committee Members: Lynette Hodnicki, City of Fairfield Lori Kyle, Greene County Teresa Shinkle, Greene County Gregg Mitchell, City of Sidney Roger Rardain, City of Fairborn Darrin Honious, YSI

NE LAC –Beverly Hoffman

Our latest meeting was on August 12th at the Akron WPCS training facility with 28 people in attendance. We discussed Salmonella with Nichole Schafer from NEORSD. Melodi Clark, from The City of Columbus, shared with us the Total and Dissolved Phosphorus Monitoring Study the City of Columbus did in September and October of 2015. Thank you to everyone that helped make the meeting a success.

Our last meeting for the year is in the works for November at the Norwalk WWTP. We will be having the meeting with our neighbors, the Northwest Section LAC. Watch for more information in your emails.

To be added to the NES LAC membership directory to receive automatic emails for training events, please email *nesowealac@gmail.com*.

LAC section chair: Bev Hoffman / nesowealac@gmail.com LAC section committee members: Marie Simon / marie@northcoastlabs.com Lisa Feigle / lisaf@gacdwr.org Amy Starkey / ajstarkey@co.stark.oh.us

NW LAC- Tony Hintze and Terry Brenner

Hello from the Northwest Section! Terri and I have been very busy lately. Unfortunately our last meeting didn't make the deadline for the August issue. The meeting was held on July 28th in Lima, Ohio. A very big thank you goes out to Alloway for not only hosting our meeting but providing a delicious lunch. We had 14 people attend earning 2.5 contact hours. Attendees heard presentations on Sample Collection and Field Measurements presented by Kim Riddell, Alloway; Stream Surveys, presented by Beth Seibert, Ottawa River Coalition; An Overview of Bioassay Analysis presented by John Hoffman, Alloway.

We are really looking forward to our next meeting as it will be a joint meeting with the Northeast LAC! The meeting will be November 17th in Norwalk, Ohio. As I am writing this we are still working out the final details, so be sure to check your email and register for the meeting if you haven't yet done so. Hope to see you there!

Terri and I are also very excited to announce the start up of our Facebook Group, NWOWEA Lab Analysis Committee. Our group is slowly growing and we invite not just the NW section members, but all wastewater professionals in Ohio to come join us. You will be able to post questions, articles, and join in on discussions about all things wastewater. The purpose of the group is to help us come together, help our peers and share ideas. We will also keep you informed on current topics, EPA regulation changes, and upcoming LAC meetings. So search for us on Facebook or send me an email letting me know that you are interested and I will send you a link (*tjhintze@gmail.com*). Come join us and start posting!

Our email list keeps growing, so don't get left out. If you would like to be added send your info to (*tjhintze@* gmail.com) or to (*tbrenner@ci.perrysburg.oh.us*). Joining this list will keep you up to date on upcoming meetings along with any important information pertaining to the Lab. We look forward to hearing from you.

That's all we have this time around. We look forward to seeing you at the next meeting. And of course, always remember, working in the lab is just like cooking in your kitchen, just don't lick the spoon!

Committee mission statement:

The OWEA, Laboratory Analysis Committee (LAC) strives to provide relevant and timely information on laboratory regulation and policy for the collection and analysis of wastewater and surface water samples. We strive to provide training in a relaxed, stressfree manner, to ensure the ability for participants to gain knowledge and skills to benefit them in their professional environment.

Plant Operations Update

by Kim Riddell and Joe Tillison, Co-Chairs

We would like to thank the OWEA Executive Committee and all OWEA sponsors for sending all three Ohio WEA teams (the NWWSD Dirty Deeds, the Columbus Outfalls and our newest team, the NEORSD Minimal Headloss) to WEFTEC this year in New Orleans to represent Ohio in the national competition! OWEA covers the expenses for the winning teams travel to WEFTEC each year and this year they again sent three teams! THANK YOU on behalf of the Plant Ops Committee and the Ohio WEA teams!

Congratulations to the Northwestern Water and Sewer District Dirty Deeds for placing 2nd in the Laboratory Event and 8th overall in Division II in New Orleans! Great job gentlemen!

The committee also held its annual Plant Operations and Laboratory workshop on October 26-27, 2016 at Columbus Doubletree. Our Wednesday featured topic was green infrastructure and the WEF National Green Infrastructure certification program. Stacy Passaro, Passaro Engineering is an engineer from Maryland and currently serves as the Program Manager for the new certification program. In addition, speakers from University of Louisville and Franklin County Soil and Water provided talks on green infrastructure and urban bio-filtration systems. Day One was rounded out by sessions on operations with speakers from Brown and Caldwell, NEORSD and Cincinnati MSD. Day Two included sessions on emergency pumping, nutrient recovery and process monitoring, CSO mitigation in Bowling Green, the OEPA Process Control Team and the advantages of personal evolution in operations. The lab committee provided concurrent sessions for Day Two as well as an all-day energy track put together by USEPA. The committee is already starting to put some great ideas together for 2017 so please plan to put money in your budget to attend next year.

If you are interested in putting a team together for Operations Challenge, becoming a member of the committee or assisting as a judge / volunteer for Operations Challenge, please contact Kim Riddell at 419-234-4507 or *kim.riddell@alloway.com* or Joe Tillison at 419-354-6274. If you are an existing team or considering having a team in 2017, we encourage you to contact us soon to get on the schedule to use the equipment OWEA has for practice. The practice schedule fills up quickly and we don't want you to miss out on that time with the equipment! Call early!! We are here to help you out!

Future Committee Endeavors - If you are looking for a place to plug yourself in within OWEA, the Plant Operations and Maintenance Committee might just be that place! In addition to Operations Challenge and our annual 2-day workshop, we have begun work on short courses for Activated Sludge Process Control and a Math for Operators Course. We are looking for people interested in writing and reviewing information for these courses as well as eventually assisting in teaching them within your section. We hope to have these courses ready and available by mid-2017. In addition, there are plans to develop a Beginners and Advanced Wastewater Operations and Collections System Courses that will be rolled out in 2018. So in addition to our regular committee activities, we have lots of new and exciting places to get plugged in! We need you - so call Kim or Joe and we'll get you in touch with our specific project leaders. We look forward to hearing from you soon!

Mark your calendars with Plant Operations activities for 2017! The Operations Challenge competition will be held at the OWEA Annual Conference on Monday, June 26th, 2017 at the Hyatt Downtown in Cincinnati, Ohio.

Kim Riddell, *kim.riddell@alloway.com* Joe Tillison, *JTillison@bgohio.org*

DELANEY & ASSOCIATES, INC. Serving Kentucky and Ohio since 1984 Water & Wastewater Treatment Distribution & Collection Equipment & Field Service Erik Torgersen • erik@delaneyandassociatesinc.com (859) 342-4944 • www.delaneyandassociatesinc.com

Test Your Knowledge - Take the Operations Quiz

1. A _____ test is used to test for deflection in flexible pipes.

- a. Ultrasonic
- b. Mandrel
- c. Water
- d. Air

2. No gravity sewer designed to convey raw wastewater shall be less than <u>inches in diameter</u>.

- a. 6 inches
- b. 8 inches
- c. 10 inches
- d. 12 inches

3. Raw wastewater is often pumped into a treatment plant. What type of pump is typically utilized to perform this pumping / lifting of the influent?

- a. Progressive cavity
- b. Air-lift
- c. Centrifugal
- d. Positive Displacement

4. There is a storm event headed your way. In order to prevent washout of your biomass inventory, you should

- a. Bypass excessive flows directly to the receiving stream
- b. Empty your equalization tanks directly to the receiving stream to prepare for new excessive flows
- c. Increase your wasting rate to reduce the current volume of biomass
- d. Switch from plug flow mode to step feed mode if available

5. Taking samples along the length of your aeration basin and at various depths throughout the tank and analyzing them for solids concentration will verify whether or not you have_____.

- a. Proper mixing of your tank volume
- b. Sufficient tank volume for your biomass
- c. Sufficient variety of microorganisms in your biomass
- d. Adequate alkalinity to buffer the your pH

Answers noted below. Questions, comments, or submit a suggested question? Email OWEA at *info@ohiowea.org.*

Answers: 1-b; 2-b; 3-c; 4-d; 5-a

LEFT: Columbus Outfalls performing at WEFTEC in New Orleans, LA. ABOVE: All three teams with President Ted Baker at WEFTEC. RIGHT: Minimal Headloss of NEORSD performing at WEFTEC. COVER PHOTO: Dirty Deads of NWWSD performing at WEFTEC.

How to Protect Yourself Against Second-Hand Stress 7 Ways to avoid catching the stress bug.

by Anese Cavanaugh First published on inc.com

You walk into work on a Monday, feeling pretty great, and are immediately greeted by the "stress bug." People zooming around, stressed out about the week at hand, discussing their weekend dramas, worrying about their next meeting, or just feeling overwhelmed by all the "magic" of Monday. Your mood starts to shift as you feel the pull of the "dark side"--the dark side of stress. What started out as an awesome Monday is quickly becoming a bummer. And nothing bad has even happened to you. In fact, not much has really changed for you from the moment you walked in the door. The only thing that has changed? You're surrounded by stress.

Stress is easy to "catch." Research shows that sweat produced under stress releases "alarm pheromones" that activate the amygdala (the region of brain linked to emotional arousal) and basically create stress and carefulness in others, according to a recent Wall Street Journal report. Stress is contagious. And if you're not good at holding your state, it'll be easy to let that stress, or as I call it, "the lowest vibration," win.

It happens all the time: with your kids (the morning shuffle), at the grocery store (there's that stressed out guy again, with 30 items in the 10 item line), at work (you start a meeting, everyone's in good shape, one or two people are putting out the "stress vibe," and before you know it, they're sinking the room).

So what to do? It's up to you. You can't control others, but you can manage yourself. Beautifully. And when you manage yourself, you're contagious too--so it works both ways. Here are seven things you can do today to help protect yourself against second-hand stress.

1. Breathe and get present to this moment, now. Notice your body, your breath, what's truly happening for YOU right now, not them, and breathe. Just this act of being present will give you space and perspective. You can choose if you wish to stress out or not from here.

2. Remember, you are not them. The person who's bringing the room or conversation down with their energy and stories of stress? That's them. Not you. Don't climb on. Don't take it on. Throw them some compassion, have empathy, but don't get in the stress pit. (You'll likely only make it worse if you do anyway.)

3. Bubble up. I teach clients and students to do what I call "bubbling up," which means activating the super power of energetic space. If you imagine you have a bubble around you--with the energy and emotion inside the bubble being all yours and everything outside the bubble being everyone else's, this can give you space to decide HOW you want to be with that person, and WHAT you want to take on or not.

4. Watch out for story time. It's so easy to get hooked into story: theirs, yours, your mom's. It's exhausting--and stressful. Instead, take a pause, and

The People Place

OWEA's leadership has opted to begin a new Buckeye Bulletin article series focusing on the people side of our industry, hence the title: The People Place. Traditionally, the Buckeye Bulletin comes loaded with mountains of technical pieces: plant profiles, industry trends, regulatory insight, project overviews, etc., which, without proper 'people-care', would not be possible! After all, your organization can only be as successful as the health,

wellness, and productivity of your people and culture. Focus areas planned for this series are topics such as leadership, management, health and wellness, succession planning, work/life balance, recruiting/retaining, change management, knowledge transfer, career laddering/branding, etc. We hope you enjoy this series as much as we are excited to bring it to you! If you are interested in submitting an article or specific focus area, please contact Jason Tincu. Thank you!

Jason Tincu, SW OWEA Delegate, jtincu@brwncald.com

check in. Is it true? Whose story is it? What are you buying into? What "charge" are you getting out of the stress? Misery loves company, and in stress, hooking someone with a story can be cathartic. Swim away.

5. Change your state. Focus on what you're grateful for. Find amusement in this moment when you're tempted to stress out. (You might even laugh at yourself.) My favorite states for avoiding (or recovering from) second-hand stress are gratitude, curiosity, compassion, amusement, and being witness.

6. Take care of yourself proactively. Practice good IEP (Intentional Energetic Presence). Get in front of it before it's even an issue. Set your intentions at the beginning of the day (or before the meeting) for how you want to feel and how you want to show up. An ounce of proactiveness is worth 10 pounds of stress.

7. Get into your body. You feel that stress coming on. You feel the lure of the hook. And what if no amount of breathing or mind exercises will do the trick? Feel your feet touch the ground. Your butt touch the seat. Get up, move, get into your body, dance if you must, smile, and shift. Stress is all around us. Every day. We exude it, we sweat it, and we take it on. Feeling stress in your space is most often a result of not being present in the moment or not being present to what's yours and what's not. As a leader, the most powerful thing you can do to support the energy in your team or organization is to model healthy stress management. Of course, this starts with you. Enjoy.

Anese Cavanaugh is the creator of the IEP Method (Intentional Energetic Presence), the author of Contagious Culture: Show Up, Set the Tone, and Intentionally Create an Organization That Thrives (McGraw-Hill), and a leadership and collaboration adviser, strategist, and thinking partner for business leaders in the design, service, and

innovation spaces. She's devoted to helping people learn how to optimize their leadership and presence, and bring their best selves to the table, for greater collaboration, impact, and cultural success.

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Roll Call

Dr. Samuel Jeyanayagam of CH2M named Water Environment Federation (WEF) Fellow

Dr. Samuel Jeyanayagam, Vice President and Senior Principal Technologist at CH2M was inducted as WEF Fellow during WEFTEC® 2016 in New Orleans. LA. This prestigious award recognizes WEF members' achievements, stature, leadership, and

contributions to the preservation and enhancement of the global water environment.

Sam is a member of OWEA and has been a regular presenter at the Annual Conferences and seminars. Over the past 30 years he has served in a variety of leadership roles at WEF including a 3-year term as Chair of the largest WEF committee, the Municipal Resource Recovery Design Committee, and was responsible for guiding the development of programs and resources for the advancement of best design practices. Sam has coauthored more than 27 WEF publications and written and presented more than 180 papers. As Task Force Chair, he led a group of industry leaders in the development of WEF's Nutrient Roadmap. Sam also serves on the editorial board of the Water Environment Research and Water Environment & Technology journals.

Interested in advertising in the Buckeye Bulletin?

Space is available for 2017!

Contact Megan Borror at meganborror@ohiowea.org for more information.

The Buckeye Bulletin, reaches approximately 2,100 addresses: public and private owners of wastewater treatment works, Ohio cities and counties, consultants, engineers, treatment plant operators, laboratory analysts, public utility managers, and Ohio EPA staff, as well as Ohio's legislative members.

This publication provides you with an opportunity to display your products and services to wastewater professionals across the State of Ohio. The Buckeye Bulletin offers technical articles, wastewater plant profiles, watershed articles, committee reports, section reports, and information on upcoming OWEA events including Specialty Workshops and the 2017 OWEA Annual Conference. OWEA members may complete the Roll Call form at http://www.ohiowea.org/memberships.php

Information regarding members who have passed away may be emailed to info@ohiowea.org

Krishna Chelupati, P.E., has joined MWH, now part of Stantec as a Senior Civil Networks Engineer in their Cleveland, Ohio office. Krishna received his Bachelors degree in Civil Engineering from Kakatiya University, India in 2004 and his Masters degree in Civil Engineering from University of Kentucky in 2005. He is a registered professional engineer in the state of

Ohio and has over 10 years of experience in the water and wastewater industry, including collection system modeling and planning, development of hydrologic and hydraulic computer models and using models as a tool to assess wet weather performance, CSO and SSO compliance, sanitary sewer capacity, support decision making, solve consent driven requirements and analyze future growth scenarios. Krishna has been an active member of NESOWEA YP Committee since 2011, and began serving as Chair of Science Fair Committee in 2014. He is actively involved in various STEM initiatives and represents NESOWEA at Good Year STEM Career Day held annually at University of Akron.

Membership Services

If you need assistance with membership details, event registration, or coursework reports, contact us at 614.488.5800 or: Amy Davis, Executive Administrator *amydavis@ohiowea.org* Megan Borror, Office Assistant *meganborror@ohiowea.org*

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We encourage you to join OWEA and reap all the benefits of membership. Same price as a posting!

"We Don't Need No...Incineration",

Lessons Learned as Columbus Transitions to 100% Beneficial Re-use of Biosolids

by Sierra McCreary, Engineering Manager, Black & Veatch Corporation & Brandon Fox, Jackson Pike WWTP Manager, City of Columbus

Columbus' Biosolids Management Strategy

The City of Columbus generates approximately 24,000 dry tons of biosolids annually combined from their two wastewater treatment facilities, Jackson Pike and Southerly. The biosolids produced at the plants include unclassified and anaerobically digested Class B. Historically, the City has practiced a diverse management strategy for these biosolids, which included incineration, land application, composting, and offsite digestion. Columbus, in conjunction with Black & Veatch, recently evaluated these management practices in a holistic approach encompassing both treatment plants. This effort culminated in the decision to cease operation of the incinerators and transition to a 100% beneficial reuse program.

The City had been operating incinerators at both wastewater treatment facilities, which were going to be required to comply with the new Maximum Achievable Control Technology (MACT) emissions standards that became effective March 21, 2016. Black & Veatch performed a condition assessment, business case evaluation, and preliminary design for upgrades to the incinerators to meet the new regulations. However, because incineration was just one component of the City's overall biosolids management program, the focus of the business case evaluation shifted from determining the extent of incinerator upgrades based on total lifecycle cost, to determining the optimal number of incinerators across the two facilities to improve and operate based on the available capacity of all the biosolids beneficial reuse outlets.

During the evaluation it was found that certain combinations of possible events could result in insufficient biosolids management capacity. As such, a risk-based cost of providing an alternative management option was included for assessing each option. B&V and City staff worked together to identify these risks and develop the probability of their occurrence. The combinations of risks, their probabilities, and consequences were summarized in risk trees to determine the total risk cost associated with each alternative. Ultimately, the evaluation found that repairs to the incinerators were not necessary if the City expanded its beneficial reuse program by initiating liquid land application of biosolids from the Southerly WWTP. The figure below illustrates Columbus' new biosolids management strategies as of 2016.

Biosolids Land Application Facility (BLAF)

The recommendations from the incinerator evaluation led to the construction of a new Biosolids Land Application Facility at the Southerly WWTP to implement the new management option. The project required an accelerated schedule to complete the planning, design, bidding, and construction in only 18 months to meet the MACT compliance date of March 21, 2016. A staged construction milestone schedule was developed which allowed the City to gain partial use of the storage tanks before the MACT deadline, yet allowed the contractor adequate time to complete construction of the mechanical and electrical facilities prior to the fall 2016 land application season. This allowed Columbus to remove the incinerators from service before the new facility was entirely operational.

The new facility includes biosolids storage tanks, a centralized control and pumping building, a truck loading station, and odor control systems. The new facility was designed to handle and store thickened biosolids with a solids concentration of 8 - 10% to minimize hauling costs.

Storage Tanks & Odor Control – Land application periods are seasonal and occur primarily in the fall

100 % BENEFICIAL REUSE PROGRAM

3-D Design Model of the BLAF

tion of 8 - 10% to minimize hauling costs.

and spring. However, biosolids are being generated continuously; therefore, on-site storage is required to make the system functional. The BLAF facility includes four, 2 million gallon tanks for a total storage volume of 8 million gallons. The tanks are concrete and include aluminum covers to contain odor and prevent rain from diluting the biosolids. Each tank has a dedicated biofilter to provide tank ventilation and odor control. The biofilter material consists of lava rock and pine bark.

Land Application Control Building - The control building houses eight progressive cavity pumps to give plant operators ultimate flexibility to provide tank recirculation and load any bay of the truck loading station from any of the four tanks. The pumps are 2 stage, 24 feet long pumps rated for 1,000 gpm at 100 psi with 125 hp motors. The pumps and system are sized to fill up to 90 trucks per day, which enables the storage tanks to be emptied in the six to eight week land application window, and maximum is then available until the next storage volume out period. The facility includes seasonal load two pumps per tank; one will continually recirculate solids within the tank while the other will start and stop for truck loading operations.

The truck loading station was designed for a high degree of efficiency, and also to provide a safe working environment for the contract haulers. The loading

Biosolids Storage Tanks

3-D Design Model of the Land Application Control Building

sequence begins with the driver pulling the truck into one of three bays, each of which is equipped with a truck scale. The driver then walks up the truck loading platform and lowers an articulating walkway onto the top of the truck. A flexible loading arm with a discharge pipe and odor hood is placed into the fill port of the tanker. The driver manually starts and stops the loading operation to reach the desired weight and thus haul volume. All of the details of the loading operation are printed on a scale ticket at the station for the hauler and also stored in plant SCADA for the City's records.

Lessons Learned

Thickened Biosolids Characteristics-One of the unique challenges in designing this facility was accounting for the fluid behavior of biosolids in the 8 - 10% total solids (TS) range. Traditionally, WWTP's will typically thicken to 5 - 6% TS for liquid injection or dewater to 18 - 30% TS for mechanical spreading. Biosolids in the 8 - 10% TS range are considered to be a non-Newtonian fluid and it becomes difficult to determine the exact operational and behavioral characteristics. The viscosity of a Newtonian fluid, like water, is only dependent on temperature and will remain constant no matter how fast it is forced to flow through a pipe or channel. The viscosity of a non-Newtonian fluid is dependent on shear rate, and Rheology testing was necessary to predict the behavior and thus pressure losses associated with pumping the 8 - 10% biosolids. Rheology is the science of the deformation and flow of fluids, particularly non-Newtonian. During design, biosolids samples were collected and sent to the ATS Rheo Systems for analysis and that data was used to calibrate the hydraulic model. Additionally, existing centrifuges, pumps and piping were available at the Southerly WWTP to conduct field pump tests which

Truck Loading & Recirculation Pump

TECHNICAL ARTICLE

provided further verification of the model. Collecting data on site specific solids characteristics was critical to the successful design of the facility.

Centrifuge Optimization - The plant had excess capacity in their existing thickening centrifuge units, so it was possible to repurpose some of those units to thicken for the liquid land application operations. Centrifuge optimization was critical to the achieving success of the project. The design goals, based on the desired hauling criteria, were to produce biosolids with 8 - 10% TS. However, in reality, there is a significant difference in centrifuge and pump performance across that 8 to 10 % TS range. Typically, centrifuges thicken up to 6% TS, and anything above that is usually considered to be in the dewatering zone of 18 - 30%. The project goal of 8-10 % TS was targeting a range that did not fully dewater the biosolids but also needed to accomplish more than just remove the free water. In this range the thickening process is very unstable which caused operational challenges that had to be overcome. The pumping system is limited at 10% and producing biosolids thicker than that would challenge the system's ability to operate. Tight thickening tolerances are difficult to achieve and it took some time to adjust the centrifuge operating parameters to optimize operations and overcome excursions outside the desired concentration range. Ultimately, the operations goal was established at 9% TS within a tolerance of +/-1% operating range. The centrifuge optimization effort provided experience in knowing when to intervene to make changes, avoiding unnecessary reaction to normal variations, and not striving for an unrealistically tight operating band.

Tank Mixing – Tank mixing is required to prevent stratification of the material, minimize slugs of non-uniform biosolids, and provide consistent characteristics within each truck load to avoid discrepancies in samples collected for reporting and

Truck Loading Station

Truck Loading Platform

the actual dry tons applied to the fields. No mixing systems were identified during design that could guarantee adequate performance at 8 - 10% TS. The design solution was to incorporate tank recirculation to keep the material in motion. The piping and pumps in the control building allow for continuous recirculation of the biosolids within the storage tanks when necessary. The operational goal is to start tank recirculation prior to the truck load-out period to get the material circulating in advance and thereby avoid any difficulty with truck loading and provide a consistent product to the contract hauler. The tanks were also designed with a minimum 4:1 floor slope and the length of the suction piping was minimized to improve material flow to the pump.

Pipe Supports – Due to the fact that an existing pipe system was being used for some of the thickened biosolids conveyance, the design team took advantage by conducting pump tests during which large harmonic vibrations were observed. Because of the tight project schedule, a contractor contingency amount was provided as part of the construction bids to analyze the existing support systems after award of the contract. During construction, Black & Veatch performed dynamic analysis for vibration for all new and existing systems conveying the 8 - 10% thickened biosolids.

The facility is currently going through operational demonstration testing and will be put into full operation in the fall 2016 load out season. Completion of this project within the reduced design and construction schedule could not have been possible without the excellent cooperation of Black & Veatch, the City of Columbus and Kokosing Industrial, Inc. Many thanks are deserved for all who were involved in the design and construction of this facility.

YOUR HEALTH

As much as 60% of the human body is water. The brain is 70% water. The lungs are nearly 90% water. We are made of water and we can't survive without it. But the water we need also must be clean. Water and wastewater treatment has changed the lives of millions of Americans—all but eliminating fatal diseases such as cholera, typhoid, dysentery, and hepatitis. America has some of the cleanest, safest drinking water in the world and it must be preserved. Your life depends on it.

Did you know?

- Water makes up more than two thirds of human body weight. We would die in just a few days without it.
- Water is one of the most essential elements to health and is so important that your body actually has a specific drought management system in place to prevent dehydration and ensure your survival.¹
- Just as a car cannot run without gas and oil, our bodies cannot work without water. All of the cell and organ functions that make up our entire anatomy and physiology depend on water to function.¹
- Drinking eight glasses of water daily can decrease the risk of colon cancer by 45% and bladder cancer by 50%, and it potentially can even reduce the risk of breast cancer.²
- The World Health Organization estimates that globally 1.1 billion people still lack access to safe drinking water and 2.4 billion people lack access to basic sanitation. That's nearly three times the size of the entire U.S. population!³
- If we did nothing other than provide access to clean water and sanitation, without any other medical intervention, we could save two million lives a year.⁴

Why should you care about water?

America's water infrastructure — the 800,000 miles of water pipe and 600,000 miles of sewer line that deliver and remove your water and wastewater — is aging and needs to be repaired, but funding for improvement projects has reached an historic low. This fact, coupled with an increased demand for water from an ever-growing population, means we must take action now. Our quality of life and health cannot be sustained without continued and improved access to clean drinking water and sanitation services. Water is our lifeline.

Small actions can make a BIG difference.

- Support and invest in your water infrastructure.
- Don't take water for granted. The water we have now is all that we will ever have. Use it wisely.
- Think before you flush. Everything you send down the pipe ends up at your local wastewater treatment plant. We are all part of the water cycle. We all live downstream.

- Educate yourself. Take a tour of your local water and wastewater treatment plant to learn what happens to the water that you drink and use.
- Read and understand your water and wastewater bill.
- Stay informed about the water quality issues facing your community by contacting your local municipality and attending public meetings.

You need water. Water needs you.

Indispensable to jobs, the economy, our health and our communities, water runs through our lives in many ways. Everyone uses water and everyone is responsible for it.

We must all work together to keep our water clean and healthy. To do that, we each need to learn to value water. **To learn more, visit** www.WatersWorthIt.org.

BE AS GOOD TO WATER AS WATER'S BEEN TO YOU. WATER'S WORTH IT. © @ @ @ @

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PLANT PROFILE

Delaware County Regional Sewer District Wastewater Treatment Facilities

by Cory Smith, Assistant Operations Superintendent

DELAWAR

COUNTY

1808

History

On June 2, 1969, the Delaware County Regional Sewer District was established. Since 1969, there has been an abundant amount of growth within the County that has resulted in nine wastewater treatment plants and 24 pump stations being constructed.

OECC

In 1970, construction began at the Olentangy Environmental Control Facility (OECC) which is located on State Route 315 at the southern end of the district's service area. The original facility was designed for an average daily flow of 1.5 MGD, which was completed in 1980. Between 1980 and 1990 the County again saw increased growth. Because of the 10 year growth, the original 1.5 MGD plant was operating at full capacity. During design of the 1.5 MGD plant, Delaware County planned on expanding this plant to 6 MGD in the future. By 1992, Delaware County began construction to expand OECC to its final capacity of 6 MGD.

Alum Creek

By 1999, Delaware County had grown so rapidly that it was realized there was a need for a new treatment plant. Most of the development and service was coming from the Alum Creek basin which is located east of the OECC service area. Therefore, in 2002, the Alum Creek Water Reclamation Facility (ACWRF) was constructed. The Alum Creek WRF was built to a design average daily flow of 10 MGD.

Zero-Discharge Facilities

Delaware County also has three zerodischarge facilities. Zero-discharge means the wastewater treatment plants do not have a National Pollutant Discharge Elimination System (NPDES) permit. Developers within

Delaware County, through their own engineers, in the past have designed treatment plants that were installed to serve the surrounding communities. After the treatment plants and necessary pump stations were constructed the County would accept these facilities to operate. The wastewater treatment plant effluent from these three reuse facilities that have been developer constructed are used to irrigate golf courses. Tartan Fields Wastewater Reuse Facility serves the Tartan Fields community which is located at the southwest corner of Delaware County. Scioto Reserve Wastewater Reuse Facility serves the Scioto Reserve community which is located at Home Road & State Route 257 in Delaware County. Northstar Wastewater Reuse Facility, the newest of the County's reuse facilities, serves the Northstar community which is located near interstate 71 and Route 36/37 in Sunbury, OH.

Land Application Management Plan (LAMP)

In June of 2013, the Ohio EPA mandated for all land application facilities be required to meet certain permit requirements. The permit requirements are not considered to be an NPDES permit because they

Olentangy Environmental Control Center.

Alum Creek Water Reclamation Facility.

do not discharge into the waters of the state. These treatment plants were placed under a permit called Land Application Management Plan (LAMP). For Delaware County, this was not an ideal situation. The LAMP's call for the following requirements-

Total Inorganic Nitrogen	10 mg/l
E. Coli	126
Total Suspended Solids	45 mg/l
BOD	40 mg/l
Total Chlorine Residual	10 mg/l

Reuse Facility History

Tartan Fields Reuse facility began receiving flow in 1999 with a design of 0.250 MGD. Scioto Reserve Reuse was constructed in 2001 with a design of 0.423 MGD. These two facilities were not designed to handle the new requirements that have been placed on them by the EPA due to the fact that both treatment plants were built by developers at the peak of the late 1990's development. Just imagine walking into your facility and foam is overtaking the walls of the aeration tanks. Imagine the clarifiers a light greenish color because you don't have treatment. Imagine, during high flow events, your filters backwashing constantly and you cannot handle the design flow/loading amount that is being forced onto you as an operator. When operators and engineers for the County are not involved in the design and build construction process with the developers of these treatment plants it becomes an operational nightmare.

Tartan Fields Wastewater Reuse Facility was designed with screening, three aeration tanks, two final clarifiers, one rapid sand filter system, and disinfection by UV and one digester. Unlike most wastewater treatment plants, Tartan Fields was not designed with equalization tanks. The benefit of EQ tanks would allow uniform flow during both high flow events and normal flow events. During wet weather events, Tartan Fields has seen flows upwards of 0.200 MGD. At this point, the filters would begin to backwash consistently. Hydraulically, this was an operational nightmare. Waste loadings are very comparable with average domestic waste strengths of 150 mg/l BOD and 40 mg/l ammonia.

Scioto Reserve Wastewater Reuse Facility was designed with two separate parallel aeration tanks with each tank having one clarifier. The entire facility has one screening method and two EQ tanks that can be used together. These parallel tanks that are identified as the East Train and West train do not have the ability to be joined as one aeration tank. The strength of the wastewater entering Scioto Reserve for treatment would be upwards of 200 mg/l BOD and 60 mg/l ammonia.

Operating both facilities would to be very challenging with the new Ohio EPA Land Application requirements. Tartan Fields had hydraulic issues and treatment issues. Scioto Reserve had significant treatment issues. Wastewater treatment consists of three major necessities in order to be successful- TIME, OXYGEN, and FOOD. Both Scioto Reserve and Tartan Fields lacked in one or two of these necessities.

Tartan Fields Plant Upgrade

It was necessary, as the staff began completing upgrades, to figure out the best way to keep the overwhelming hydraulic issues at bay. There were many times that once flow reached 0.200 MGD the plant was inundated with flooding. It became routine for operators and the collections crew to be cleaning the plant floors of mixed liquor due to flooding the tanks. Staff determined that we would need new tertiary filters. Delaware County decided to purchase cloth media mini-disc filters. While the filters were being designed, internal staff began to upgrade the effluent piping from the aeration tanks. At the time of upgrade, there were 8" pipes used to carry flow to the clarifiers. The first project completed during the upgrade was upsizing the 8" pipe to 12" piping. While

Tartan Fields Anoxic Zone Wall.

Tartan Fields Anoxic Zone Mixer.

PLANT **P**ROFILE

upsizing the pipe to 12" the Regional Sewer District (RSD) also moved the aeration effluent. Instead of having three effluent pipes at the end of parallel tanks, RSD installed a plug flow system in order to help with the time it takes to nitrify and de-nitrify. In order to de-nitrify, the second step in upgrade was installing an anoxic zone. Installing a wall for

zone integrity and a mixer to keep the solids suspended.

In August of 2015, the Delaware County operations team started directing flow to the brand new cloth media mini-disk filters. The filters were designed to each handle 0.750 MGD. There were two filters installed. This would definitly give the operations staff some help with hydraulic issues. The main issue we feel that led to purchasing new filters was that the old filters backwashed too often, which overwhelmed the facility with flow being recirculated instead of leaving the plant. Currently, we only have one filter operating, even during high flow events.

Scioto Reserve Plant Upgrade

Land Application requirements called for Total Inorganic Nitrogen to be less than 10 mg/l. The main design issue with Scioto Reserve was the inability to denitrify. The aeration tank consisted of both course bubble diffusers and fine bubble diffusers. When the plant was originally designed the course bubble diffusers were supposed to provide mixing in the first third of the aeration tank. The rest of the aeration tank has fine bubble diffusers to provide oxygen for nitrification. Over time, the operators found that the course bubble diffusers were taking too much air from the fine bubble diffusers, causing a lack in nitrification.

The first step in the upgrade was to remove the course bubble diffusers and install a true anoxic zone. The

onal **"The anoxic** anox zones that were constructed and installed were completed by a team effort within the Delaware County Regional Sewer si for District." prov

anoxic zone consisted of installing a wall for zone integrity and a floating

mixer in order to keep the solids
suspended. Through testing, we have found that it is not necessary
for installing a recirculation pump
for nitrates at the end of the aeration tank. The return activated
sludge coming from the clarifiers
provide a sufficient amount of nitrates

in order to satisfy the LAMP permit total inorganic nitrogen limit as well as stocking the anoxic zone full of nitrate. Glycerin is added to the anoxic zone to help with supplying BOD for the organisms. Providing glycerin in place of food helps the organisms' uptake the nitrates which enhances the de-nitrification process.

Conclusion

It goes without question the most important decision made during the planning of these upgrades was to complete these upgrades with RSD staff. If these projects were completed with outside contractors the County would have paid nearly \$245,000 in design & construction for both facilities. The anoxic zones that were constructed and installed were completed by a team effort within the Delaware County Regional Sewer District. This includes, but not limited to, tanks being cleaned and prepared for construction by the collections department, installation of the anoxic zone walls and mixer by the maintenance department, and the preparation and continued wastewater treatment by the operations team. Without all three of these departments working together, these projects would not have been completed successfully.

Developers are ultimately not engineers or operators, therefore many obstacles and issues were required to be addressed at each facility. The Northstar Water Reclamation Facility is starting up very soon and the RSD staff may face some of the same issues.

Tartan Fields Aqua-MiniDisk Cloth Media Filters.

Scioto Reserve Anoxic Zone Mixer.


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A Chat with '68-'69 President Bill Hill

by Megan Borror, OWEA Staff

Staff: When did you first get involved with OWEA?

Bill Hill: Before it was OWEA. *laugh* Let's see, I first joined in 1954. April of 1954.

Staff: Can you think of anyone that's been a member longer than you?

Bill Hill: No. *laugh*

Staff: I was going to give you a hint. You're the fourth oldest member we have.

Bill Hill: Really?

Staff: I have John Litchfield, he joined in '51. George Newell, he joined in '52 and Lawrence Rigby, he joined in '53.

Bill Hill: Rigby? Yeah, I worked for him one time.

Staff: Yeah, he was a president in the '70s.

Bill Hill: Yeah.

Staff: I didn't know if you would know any of them.

Bill Hill: Yeah, I know Larry and I know George Newell. I didn't realize Larry was still a member. He's still alive, he's in Marion. I think that's where he is right now. He's an avid golfer.

Staff: Amy and I were both very surprised to find that you weren't the oldest member!



Bill Hill receiving the Dean Stewart Award at the 1960 Annual Conference. Image originally printed in Summer 1960 Issue of Buckeye Sludge.

Bill Hill: Yeah, really! That's interesting!

Staff: Do you remember when you first appeared in the Buckeye Bulletin?

Bill Hill: No. Well, let's see, I was President in '68.

Staff: It was way before that. You were in a lot of Buckeye Bulletins. The first one [you were in] was in the summer in 1958. You were talking about a workshop you are helping with. It was cool when your name first started showing up and then you were in pretty much every one for the next 20 years.

Bill Hill: Oh, really? You see I didn't realize that. Yeah, well you just do it. You don't think about it.

Staff: What were some of your roles in OWEA over the years? Or before it was OWEA?

Bill Hill: Oh boy. Well I was avid about training. That was a big thing. Then we ended up starting OTCO. I was on the Education Committee, OTCO, oh boy. *laughs*

Staff: I figured it would be a long list.

Bill Hill: Yeah, Operations of course. I was always big on Operations. That's why I got into training. I was in OWEA before our certifications were A, B, and C. I had an A Certification and then they switched to numbers. I might even be the oldest, or one of the oldest Class IV Certified Operations. My Certification was in September 1967, Class IV

Staff: '67 since you have been a Class IV? That's impressive!

Bill Hill: Yeah, that was a long time ago and a lot of water over the years. *laughs*

Staff: Do you remember other awards that you've been presented?

Bill Hill: Oh boy. Well, I had a few and I was always very proud of them and I never expected any of them. One I know I got was the Dean Stewart. It's interesting. I got the Past Presidents of course. I was President in '68. It was interesting.

Staff: And you were a Section President before that.

Bill Hill: Yes, Northeast. I was on a number of committees, state committees. Education and we started the OTCO from the Education Committee and Galen Gault was the President of the AWWA Education Committee and I was President of the OWEA and we started OTCO from that. I have been disappointed with OTCO, where it went, rather.

Staff: Out of all of the different roles and positions you've had, what would you say is your favorite?

Bill Hill: I'd say that training. There's a lot of—how would I say that-- there's a lot of satisfaction with seeing younger

operators move up and be trained and catch on and I'm still doing that. There's a number of plants that I just stop in and help them with stuff.

Staff: How did you first get involved with OWEA? Well, before it was OWEA.

Bill Hill: I think it was my father-in-law who got me into this business. I think he mentioned OWEA. The first time I joined was the Water and Sewage and Industrial Waste Treatment Conference when I joined.

Staff: And was he in the wastewater industry?

Bill Hill: Yes, he was.

Staff: What did he do?

Bill Hill: He worked at Ravenna Arsenal and he retired from Ravenna Arsenal. Let's see, I was going to college at the time and I was working on a load line in Ravenna Arsenal and we were about to be married and he came to me and said, "I got a job opening in the wastewater business. Would you be interested?" And I think I said something like, "What's the pay?" And it was a dime more hour at the time. *laughs* So I said, "I'll take it!" That's how I got into wastewater. I worked for a guy in Ravenna Arsenal who was very, well, he kept pushing me to get certified and all that kind of business. That was Bob Howell. He was my father-in-law and my supervisor.

Staff: So you had to listen to him at home and at work? *laughs*

Bill Hill: Yeah. *laughs* I guess. And then a job came open a couple of months after I went in Ravenna Arsenal and I was working there for about six months. Later, a job opened up, Windham, it was changing from federal government to a village and I took the job in Windham and I worked from 7:00 [am] to 3:30 [pm] in Windham and then I worked from 4:00 [pm] to 12:00 [am] at Ravenna Arsenal.

Staff: How long did you do that?

Bill Hill: I did that for about two years. That was a good experience. We got married in that time. Let's see I got married in... when did I get married? *laughs* 64 years now so it's got to be what '52? Yeah, I believe. I would have to go back, and we got married in June.

Staff: What has pushed you to remain so active after all these years?

Bill Hill: I enjoyed the people. I suppose a lot of people say that but I really enjoy the people in this business. Most of them are very honest and very straightforward and want to do what they're doing, you know. Yeah, it's the people. I've been very blessed over the years.

I had 22 years in Operation and I went with Floyd Browne. In fact, that's when I worked for Larry Rigby and that was in 1960. I worked for them for 10 years. I started in an O&M Service Group which did plan startups and training for

"There's a lot of satisfaction with seeing younger operators move up and be trained and catch on and I'm still doing that."

Floyd Browne. I always complained the engineers were not providing any startup services and Larry Rigby and Tom Dunn. Tom's gone now, he was killed in an automobile accident, but those two guys came to me when I was at Columbus Southerly and asked me if I could come up with let me put my money where my mouth was so

I said, "Okay" and I went up there and started O&M Services and that was interesting, that was fun.

We had 130 clients in Ohio. And that was all operation maintenance. Wrote O&M Manuals, did training. Everything started out with me and ended up with eight people and Floyd Browne. It was the first one in Ohio. I worked there for 10 years and CDM was the first one in the country and they recruited me to go to Boston and I didn't want to go to Boston, at first, but after the interview, I went to Boston and became a Vice-President at CDM. I ran their O&M Services Group of 150 people. Then they asked me to come back here and start offices for them in Ohio and that's how CDM got started in Ohio. Now there's three offices in Ohio.

We were all over the world. I have traveled in 26 countries in all 50 states. That's an accomplishment in itself. That's why I said I've been very blessed. Some of those were private but some of them weren't. Like my wife and I went to China and stuff like that but those are private things. We did a lot of it in the Middle East before it got all so upset. I was in Lebanon, Jordan, a plant started up there. That was very interesting.

Staff: You are going to make everyone jealous that reads this article.

Bill Hill: I could tell some real stories about some of the overseas stuff. It's really fun.

Staff: What would you say is the biggest change that you see in the organization since you started?

Bill Hill: Hmmm.

Staff: I'm sure there's been a lot.

Bill Hill: Yeah, there's been a lot. I'm glad to see them get back to training, I'll tell you that. But the biggest change? The organization has grown to do some pretty neat things. It's more organized than it was when I was chairman. I mean



City of Warren Wastewater Treatment Plant when Bill Hill was Superintendent. Image originally published in Spring 1961 Issue of Buckeye Sludge.

FIRESIDE CHATS

we were very organized, but it's grown. How many members do you have now?

Staff: Over 2,000.

Bill Hill: I think I was chairman the first time it went over 500. That's really grown. People seem to take an interest in wastewater. Once they get in, they

don't normally leave it. Yeah, not many leave it. It's very interesting. I'm sorry to see that 30 year thing but...

Staff: What 30 year thing?

Bill Hill: Well they retire in 30 years and when someone can't wait for 30 years, then I don't know what they do with themselves.

Staff: What direction would you like to see OWEA go moving forward?

Bill Hill: I'd like to see them involve the members more whether it's training or whatever, I'd like to see them involve the members more. I'm not sure just how you do that through committees. I know you mirror WEF. You see, I was a director at WEF for years.

Staff: Oh, I didn't know you went up to WEF!

Bill Hill: Yeah. No, I was there for a long time, probably eight or 10 years. I was chairman of the Publications Committee that separated the journal. We separated that into an Operations and a Research thing. I was very active in WEF.

When I was chairman of that committee, there was the San Francisco earthquake. *laughs* They always told me, "Don't go to work for Bill Hill on a committee because even if there's an earthquake, you are going to get assignments!" I told them to get under the table because some of the ceiling tiles were falling out and stuff. We all got under

the table when we were right at the end of the meeting so I was given assignments to some of the members and stuff, you know, to continue some of the things we were doing. *laughs* They always teased me about that, "Don't get on a Bill Hill committee because you'll get your assignments while you're under the table while an earthquake is going on."

Staff: That's good! That means you're persistent. You know stuff still has to get done.

Bill Hill: *laughs* Yeah, it was funny.



Officers of the Northeast Section-left to right George Pforsich, Exec. Comm., Canton; Mor Ake, Chairman, Bedford; Carl Viall, Exec. Comm., Akron; Bill Hill, Secretary, Wadsworth; Oscar Soroko, Treasurer, Cleveland.

Bill Hill (second from the right) while he was Secretary for the Northeast Section. Image originally printed in Summer **Staff:** How different was 1959 Issue of Buckeye Sludge.

the first conference you went to compared to the last conference you were at in 2016?

Bill Hill: It's bigger. More, a lot more, exhibitors. I think OWEA has done a pretty good job in general. You know, it's gotten really big in the exhibit area, you know. I think I'd like to see more people get involved in the operator stuff. I'd

"They always told me,

'Don't go work for Bill

Hill on a committee

because even if there's an

earthquake you're going

to get assignments!""

like to see more, Ohio's got a lot to offer. They need to send more people to WEF to tie the two together.

Staff: I like to think we're the best MA.

Bill Hill: You should! You could look at other state organizations and I'm not sure you could copy them. I think Ohio kind of leads a parade. I think we need to do a little more boasting

about that on the national level you know because they've got some good people in this organization. You've got a lot of good people.

Staff: What is the coolest thing that you've been able to do because of OWEA?

Bill Hill: Training, absolutely. You knew that was coming. Well you know I never looked to get promoted or never looked to get to an office. I just did what I thought had to be done. I'll never forget when we started the first training session. It was in Akron and it was at the Akron Treatment Plant and I drove over there with my father-in-law and I was really nervous because I was going to lead the first training session. OTCO grew out of this what we did in Northeast and we were going to Akron to set up this thing and I said, "Boy, if we have one person show up we're going to be lucky," you know. I was really fussing about it. My father-in-law kept saying, "If you get one person and he's learned something, you've done the job," you know, he encouraged me. We got there in the very first training session we had in the Akron Wastewater Plant, we had 100 people. I was really concerned because the people that were going to teach were people that I really looked up to, you know, one was the Director of Wastewater, Water Pollution Control in Cleveland, Walter Gardell. George Simpson taught math, he was with Emerson. He ended up being a president of OWEA [1970-1971].

Staff: I should just cut this entire article down to Bill Hill started everything. *laughs*

Bill Hill: I don't know about that. Like I say, I never thought about doing anything particularly and if it needed done, I just did something and it always turned into something else. Very interesting I said, I've been very blessed.

Staff: How has OWEA influenced your career and your life?

Bill Hill: Well, it's always been the base of my involvement in the water pollution control field. I always have tried to build it up, you know. I like some of the sessions that you guys do now like [the Plant] Operation [Workshop] and stuff. I like those specialty conferences you do. I know they're a lot of work but you've got to guard against seeing the same people talk all the time. Sometimes you go to one you know you know and you go, "I've heard him before I suppose he'll

do the same thing." Very interesting.

Staff: Now I have some questions about your career. I guess we already talked about how you got into the industry through your father-in-law.

Bill Hill: You know I ran lab tests and picked up samples of stuff around the Ravenna Arsenal to make sure it met compliance. That was a long time ago.

Staff: And what was your first job title? Do you remember?

Bill Hill: No. *laughs* I ran some lab tests and stuff like that for them. I was in chemistry in college. I went to Kent State. You know looking back now, I don't know how I did all of that. *laughs*

Staff: If you don't mind me asking, do you remember what your first salary was at the Ravenna Arsenal? I just thought it would be interesting for our members to compare.

Bill Hill: \$1.28 an hour.

Staff: That was good back then, wasn't it?

Bill Hill: Yeah, well, I worked two jobs when I first got married so that you know the Arsenal and Windham. I worked both of those jobs when we first got married because they knew all kinds of experience number one. We rebuilt one. That's why I say I could tell you a lot of stories about Windham. The two of us rebuilt the wastewater plant. It was all out of wood because of the war and all of the Trickling Filters and the sides of the Trickling Filters were all out of wood. We'd put things around it and pulled it up and shoveled all the *laughs* slag

NORTHEAST SECTION NEWS

The May meeting was scheduled to be held at the Firestone Tire and Rubber Co., Akron, Ohio, but due to a strike the meeting was rescheduled to the Akron Sewage Treat ment Works. Because of the change there were only 41 present but a good time was had by all.

A June meeting was not scheduled, leaving everyone free to attend the conference at Cincinnati.

The July meeting was held at the Canton Sewage Treatment Works with 71 members present. An inspection was made of the garbage grinding plant, the sludge farm. The treatment works is of the activated sludge type. The balance of the afternoon was spent touring the Ashland Oil Refinery. After the business meeting, a movie was presented by the Ashland Oil Company showing the drilling of the first oil well in Titusville, Pa.

The August meeting was held at Herb Hansen's, Ravenna Sewage Treatment Works. A membership drive has been started in

the Northeast Section to obtain new members for both the section and state conference. They have set a goal of one-half the members required to put the State Conference membership over the 500 mark. They have issued a challenge to the four other sectional groups to obtain the other one-half.

Bill Hill is a very busy secretary, but he always finds time to send news.

Bill Hill's Northeast Section Report originally published in the Fall 1959 Issue of Buckeye Sludge.

up on top until we got the sides up again. All that kind of good stuff. We did a lot at the arsenal. I missed my Class B at the time by a point and 2/10 and I made the comment to the state, the guy that came over to visit the Windham plant, that I needed an activated sludge plant. That's the only time I ever asked for a job. I never looked for a job.

Staff: They just always come to you?

Bill Hill: They always come to me, yeah. Still does. That's why I still work! *laughs*

Staff: What are some of the plants that you've worked at in Ohio?

"I got the reputation for starting facilities."

Bill Hill: I could probably name them all. I got the reputation for starting facilities. I went from Ravenna Arsenal, Windham, went to Wadsworth, that was an expansion at the time. I went to Warren which was a new plant, went to Youngstown that was a new plant. Then I started up Columbus Southerly. I started up all of those plants. Columbus Southerly was the last one. After that I went with Floyd Browne.

Staff: That's a long list!

Bill Hill: Very interesting. When you think of it, Wadsworth, Warren, Youngstown, and Columbus Southerly were all startups. They were all brand new.

Staff: They hadn't opened at all until you started working there?

Bill Hill: Yeah, hired the people. The whole bit. It was very nice. That's why I say I have been very blessed.

Staff: Would you say that you have a favorite plant that you've worked at?

Bill Hill: Yeah, Columbus Southerly. I was there about five years before I started O&M Services.

Staff: Any reason why it's your favorite?

Bill Hill: I guess at that time it was the biggest plant in the state. It was an activated sludge plant, it had a little bit of everything. It had incineration which I did up in Warren and Youngstown. And because of the people, again, they had some really good people, a good maintenance group. We brought some of them from Jackson Pike, some of them brand new, I hired them. Most of them were in the business for the rest of their lives.

Staff: So you started a lot of people's careers?

Bill Hill: Yeah. I like that. I always encouraged them, you know. I get mad when they don't go where I want. *laughs*

Staff: What would you say is the plant that you've seen improve the most in your time in the business? Whether it is one you have worked at or not worked at... but you've seen some from scratch so it's a harder question.

Bill Hill: It is hard to get away from "Learn all you can learn. changes. By time I learn what's going on the present. I have to say, I have been pleased lately with the progress that was made in Galion. It wasn't running really well. I talked to the operator a lot

and got him doing calculations and stuff like that. It's turned around. It is running like it oughta run now. Yeah, there's a lot of them. I just enjoy the business. I enjoy sitting down and doing calculations with the guys. You know, making them realize that you can't just run it by the seat of your pants. They're pretty sophisticated, you've got to stay with it.

Staff: Yeah, they're always changing.

Bill Hill: They sure are.

Staff: Any major plant inventions or advancements that you saw when they first came out?

Bill Hill: Fine Bubble Diffusion and Activated Sludge, that's another big one. And then how we handle Biosolids, you know, the concentration of them. We used to run vacuum filters of lime and ferric chloride and now you wouldn't even think about that. You know, centrifuges are a big thing now. They do a good job. They run much slower. They're good. I've seen a lot of changes.

Staff: I was trying to picture the first plant you worked at compared to plants today.

Bill Hill: I'll have to take you up to Delaware City sometime. That's a very well-run plant. I worked there for four years too, that was during an expansion. That was just recent too. That is a very well run plant. The water that comes out of there—you could put a glass of drinking water and a glass of treated sewage next to it and you couldn't tell the difference.

Staff: Is there anything that you want to tell younger members about the industry? Advice or wisdom for their careers?

Bill Hill: Learn all you can learn. Be ambitious. Be honest. That means be honest with yourself and your employer. I've been to a lot of plants and all they do is gripe about their employer. Attitude. If I had a poor attitude, I would have never done anything. That's what I said, I certainly don't know it all, you know, technology is just going really fast. A lot of

Be ambitious. Be honest."

now, it's time to learn something new. *laughs* I think the automation of plants and the computer driven reporting and that kind of stuff is very, very good if

it's done right. It provides a lot of information that we didn't normally have. We had to do it all by hand. I think one of the things you really have to guard against is EPA reporting system has to be plant oriented. One size doesn't fit all.

Staff: Is there anything that you want the younger operator to know about OWEA? Or advice?

Bill Hill: Yeah, I think they ought a join! Join the local, if they don't do anything else, join the sections. Once they go to the section, they'll see the advantage of going to the state. Sections are very good. I still attend quite a few section meetings when I know about them.

Staff: Anything else that you would like to share with the membership?

Bill Hill: I think it's been it's been really good. I'd like to share with the membership that I enjoy the people very much and I want to see them, still, stay with the growth of the industry. I think anybody that works hard can do anything they want to do. I go in some plants and guys are sitting there

with their feet up and stuff and I said, "What are you doing that for?" They say, "I don't have anything to do!" and I say, "Heh, heh, heh, go find something!" One of the things I think I'm most proud about this business is that I never looked for a job. That's very interesting. I enjoy the business so much, you get so wrapped up in it, even yet, even with this business that we're doing now. Very interesting.



Bill Hill during his interview at the OWEA office.



Fireside Chats

OWEA has started a new article series for the Buckeye Bulletin focusing on leaders in the industry. This Question and Answer Feature will dig into their leadership role and how it has had an impact on the industry. We will be focusing on leaders from OWEA to Plant Superintendents and every leader in between. Please nominate your boss, coworker, or someone you admire for a future article by emailing Megan Borror at: meganborror@ohiowea.org.



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How Will Our Water Resource Recovery Facilities Look Like in a Carbon—and Energy—Constrained World?

by Samuel Jeyanayagam, PhD, PE, BCEE, WEF Fellow Vice President/Senior Principal Technologist, CH2M, Samuel.Jeyanayagam@CH2M.com

Introduction

Population growth, rapid urbanization, linear resource consumption and are causing a range of global and regional pressures. Experts believe that we have overstepped the safe operating space for critical planetary conditions (climate change, nutrient cvcle, and biodiversity), thereby undermining the carrying capacity of our island planet. It is clear that business as usual is not acceptable and a paradigm shift is needed to reverse the trend and avoid disastrous consequences.

How can the wastewater industry respond? Our current wastewater treatment philosophy is primarily focused on meeting effluent limits. Energy and resources are assumed to be cheap and unlimited,

an untenable operating scenario. This article

outlines a few of the many opportunities available for today's treatment plant to evolve as water resource recovery facility (WRRF) of the future. Some of these are 'low hanging fruit' that can be implemented quickly while others entail proper planning and capital-intensive upgrades.

(Note: The focus of the article is carbon management. It does not address the recovery of water, a resource of greater value.)

Welcome Without carbon (C), life as we to Anthropocene! **Experts believe** Anthropocene is the current geological age, during which human activity is the dominant influence on earth's climate and the environment.

"The planet is our life support system carbohydrates, lipids, that provides us with air, water, fodder and climate control. Why would we want to interfere with its functioning?" Prof. about 4.1 kcal/g. Chris Rapley, University **College London**

know it would not exist. Carbon has a tendency to combine with other elements to form stable, very large, and complex compounds, commonly called organic matter. For example, living forms have nearly ten million C-based compounds that may he categorized as proteins, and nucleic acids. Of these lipids (fats) have the greatest amount of energy (9 kcal/g). Proteins and carbohydrates each have

Municipal wastewater contains many complex carbon containing compounds. We do not attempt to identify

each compound but use biochemical or chemical oxygen demand (cBOD or COD) as a gross measure of the organic content. Historically, organic matter has been considered a pollutant and WRRFs perform BOD removal by oxidizing the carbon to harmless by-products, carbon dioxide and water. This is because aerobic biological treatment is currently the only reliable means to remove soluble organic carbon and meet permit limits. However, this approach represents a waste of energy and the

Importance of Carbon



Figure 1: Options for Enhancing Digester Gas Production

WRRFs operate under large energy deficits. In a carbonand energy-constrained world, the WRRF of the future will need to adopt a new operating paradigm that seeks to channel the influent carbon for the following three beneficial uses, which are discussed below:

- Energy production
- Nutrient control
- Resource recovery

Energy Production

As noted above carbon compounds pack energy. It has been estimated that municipal wastewater contains nearly five times the energy needed to treat it. The energy embedded in wastewater can be heat or thermal energy (80%); chemical energy contained in the organic compounds (20%); and hydraulic energy due to the elevation or movement of water (<1%). Overall, the wastewater sector has the ability to generate the energy needed to heat approximately 13 million homes. This implies a WWRF can be energy-neutral or even energy-positive.

Anaerobic sludge digestion is a proven and commonly used route for capturing energy (as biogas) from influent carbon. Yet, only 30 percent of the plants greater than 1 mgd have digesters. This reveals the vast untapped opportunity. As illustrated in Figure 1, many options are available to enhance gas production from existing digester facilities.

Carbon Capture

Influent carbon (BOD) can be harvested and channeled to anaerobic digestion. This provides two benefits: reduce the aeration demand by about 25 to 30 percent and increase biogas production. The disadvantage is that less of the influent carbon will be available for nutrient removal and/or resource recovery. WRRFs that have primary clarifiers are able to divert 25 to 45 percent of the influent BOD to the digesters. Conversion to chemically enhanced primary treatment (CEPT) will result in 40 to 80 percent of the influent BOD being channeled to biogas production. Carbon can also be harvested from primary effluent using microscreens, Fuzzy Filters $^{\rm TM}$ and Cloth Depth Filters.

Carbon can also be redirected by operating the biological process so that the influent BOD is adsorbed to the floc and removed with the waste activated sludge (WAS) and directed to the digester. Adsorption is a surface phenomenon, which results in particulate, colloidal, and soluble BOD adhering to the surface of the floc. An example of this is the two-stage A-B process shown in Figure 2. The high-rate A Stage uses a smaller reactor operating at very short SRT to promote BOD adsorption and minimize oxidation. Stage B is sized for nitrification. The patented Captivator[™] system by Evoqua also accomplishes the same goals by using a vertical loop reactor and dissolved air flotation unit.

Waste Activated Sludge Biodegradability

Anaerobic digestion is a multistep process. Hydrolysis, the first step, involves the conversion of organic solids to soluble compounds and is controlled by the biodegradability of the digester feed. Pretreatment of the feedstock ruptures the lignin based cell wall thereby increasing the amount of nutrient-rich material available for digestion. Sludge pretreatment can potentially improve dewaterability and reduce the amount of biosolids to be disposed. Some of the available sludge pretreatment technologies include thermal hydrolysis, sonication, pulsed electric field, and homogenization.

Advanced Anaerobic Digestion

Conventional anaerobic digestion process can be modified to increase gas production. Some examples are thermophilic, temperature phased, and acid-gas anaerobic digestion.

Co-Digestion

Adding an external source of concentrated and readily biodegradable carbon waste to an existing digester is a proven method of increasing biogas production. This option is readily implementable at a WRRF with available



digester capacity and can have a significant industrywide impact since only 17 percent of digester facilities in North America practice co-digesting. Examples of external energy-rich wastes include.

• Lipid wastes such as fats, oils, and greases (FOG).

• Simple carbohydrate wastes from bakeries and breweries; sugar-based solutions from confectionaries and soda pop producers. Complex carbohydrate wastes from fruits and vegetables as well as organic fraction of municipal solid waste stream (OFMSW).

• Protein wastes from meat, poultry, and dairy industries.

• Organic feedstocks such as glycerin from biodiesel fuel production.

Energy Conservation

"Investing \$4.8 billion (25% of the amount spent in the US on video games) in the 100 largest WRRFs would make them energy neutral and save 41 million barrels of oil (enough to power 2.2 million homes annually)." WE&RF

Studies have shown that approximately 60 to 70 percent of the energy used at WRRFs is for aeration. Consequently, it offers the greatest opportunity to realize energy savings. The following is a brief discussion of some of the available options:



Figure 3: Schematic of Membrane Aerated Biofilm Reactor • Implementing carbon capture described above can minimize BOD oxidation and reduce overall aeration demand.

• Conversion from coarse to fine bubble diffusers will enhance the oxygen transfer efficiency.

Bulk Liquid • An emerging technology, Membrane the Aerated Biofilm Reactor (MABR), employs a hollow fiber gas transfer membrane to deliver oxygen by diffusion to a biofilm that grows on the surface of the membrane (Figure 3). Oxygen diffusion occurs due to concentration gradient. Loosely referred to as 'bubbleless' aeration,

MABR is touted to deliver oxygen up to four times more efficiently than fine bubble diffusers.

• WRRFs that are able to create an anoxic zone by turning off diffusers at the head of the aeration basin can realize 4 to 15 percent energy savings. Installing

a baffle to separate the aerated and unaerated zones will further enhance the effectiveness of the selector. In a selector zone, nitrate in the RAS or mixed liquor (if an internal recycle is used) is the oxygen source. Selector zones can also be expected to enhance sludge settleability.

• According to conventional wisdom, maintaining the aeration basin dissolved oxygen (DO) at 2 mg/L or higher represents safe operation. This approach, however, contributes significantly to operational costs and carbon footprint. Full scale operation has shown that adequate treatment can be achieved at DO levels of 1 mg/L or less, taking advantage of simultaneous nitrification and denitrification (SND). In addition, careful acclimation of the process to low DO conditions can aid in the selection of low-DO bacterial populations. Facilities interested in low-DO operation should conduct site specific testing to ensure solids settling in the aeration basin and filamentous growth do not pose operational issues. Integral to successful low-DO operation is the use of ammonium-based DO control to avoid over- and under-aeration.

• When nitrogen removal is required, incorporating short-cut nitrogen removal or deammonification can reduce oxygen demand and carbon requirements. These novel processes are discussed below.

• Mainstream anaerobic treatment of low strength liquid waste (municipal wastewater) using the upflow anaerobic sludge blanket reactor (UASB), shown in Figure 4, is a proven technology with over 35 years of operational experience mostly in warmer climate. Anaerobic membrane bioreactor (AnMBR) is an emerging technology that has been used in industrial applications and is being researched for municipal treatment. Anaerobic processes eliminate the need for oxvgen while minimizing sludge production.



Figure 4: Upflow Anaerobic Sludge Blanket Reactor

◆ The hydraulic energy in wastewater effluent streams can be harvested with a low head turbine/generator. A recent plant survey indicates thatabout 50 percent of WRRFs have suitable hydraulic drop for energy recovery. Treated effluent is diverted from



Figure 5: Turbine/ Generator (HydroeKIDS Type S)

the outfall pipeline and passes through one or more turbine-generator units (Figure 5) before flowing into the receiving stream. A bypass is incorporated to deal with hydropower system shutdown or high flows.

• Wastewater temperatures generally range between 10° C and 15° C in the winter and over 20° C in the summer. Heat recovery from wastewater can be accomplished with a heat pump or heat exchanger to transfers heat energy from the wastewater to a closed-pipe system containing a carrier fluid (water or refrigerant), which delivers the heat for space or hot water heating. The amount of heat recovered from raw wastewater and treated effluent is dependent on wastewater temperature, flow rate, and heat transfer efficiency.

Nutrient Control

Use of influent carbon for nutrient removal is a cost effective approach. Considering the other beneficial uses of carbon (energy production and resource recovery), the WRRF of the future may need to balance the available influent carbon based on plant-specific factors. This section discusses the carbon requirements for nutrient removal and outlines options for consideration if there is a lack of organic matter.

Phosphorus Removal

Enhanced biological phosphorus removal (EBPR) is fueled by the availability of readily biodegradable organic matter (rbCOD) in the anaerobic zone, in particular volatile fatty acids (VFAs). As shown in Figure 6, the greater the proportion of the rbCOD the phosphorus accumulation organisms (PAOs) are able to access, greater the PAO fraction in the mixed liquor, greater the P-content of the WAS, and higher the EBPR efficiency. Depending on the influent characteristics, the minimum rbCOD:TP ratio required for reliable EBPR is 10:1 to 16:1. If there is a shortfall of influent carbon, the following strategies may be implemented to meet effluent TP goals:

• Incorporate fermentation to generate VFAs onsite. This can generally be accomplished using active



Figure 6: The Impact of rbCOD Uptake on Sludge P Content (Barnard et al)



Figure 7: RAS Fermentation (Barnard et al)

primaries (with sludge recirculation), off-line primary sludge fermentation using dedicated fermenter/ thickener. It is also possible to generate VFAs by diverting a portion of the RAS to a fermenter tank with an SRT of approximately 2 days (Figure 7).

• Purchase commercially available volatile fatty acids (acetic and propionic acids).

• Add supplemental chemical when needed. Since this involves using both EBPR (when possible) and chemical P removal, chemical addition should be practiced judicially to avoid over-feeding, which can gradually increase the dependency on chemicals.

• Abandon EBPR and convert to chemical P removal.

Nitrogen Removal

As illustrated in Figure 8, conventional nitrogen removal is accomplished using the high-energy nitrification and the high-carbon denitrification processes. If adequate influent carbon is not available, the use of an external carbon source such as methanol or glycerol would be required to sustain denitrification.



Figure 8: Conventional Nitrogen Removal Process

Recent advancements in biotechnology have unearthed novel metabolic pathways that represent low-carbon, low-energy nitrogen removal processes. These are now in full-scale use at WRRFs:

• Shortcut Nitrogen Removal: As shown in Figure 9a, this is a modification of the conventional nitrogen removal process where nitrate formation is avoided. The nitrification reactions stops with nitrite, which is then reduced to nitrogen gas. This results in energy and carbon savings as illustrated. The prerequisite for this process is reliable repression of the second oxidation step by preventing nitrite oxidizing bacteria (NOB) from accumulating in the system.

• Deammonification: In this metabolic pathway,



Figure 9a: Short-cut Nitrogen Removal

shortcut nitrogen is taken to another degree resulting in further savings in carbon and oxygen. As shown in Figure 9b, only about half the ammonia is oxidized with free oxygen and the resulting nitrite is used for the oxidation of residual ammonia. This reaction is known as anaerobic ammonia oxidation (Anammox). Table 1 compares the different nitrogen removal processes with respect to carbon and energy use.

Parameter	Conventional Nitrogen Removal	Shortcut Nitrogen Removal	Deammonification
Carbon Requirement	1	0.75	0
Oxygen Requirement	1	0.6	0.3
Energy Demand	1	0.5	0.2
Solids Production	1	0.7	0.35
Nitrogen Removal Efficiency	97%	90%	90%
Solids Retention Time (days)	> 3	> 2	> 25

Table 1: Quantitative Comparison of Available Nitrogen Removal Processes

Accumulation

- Enhanced biological phosphorus removal (EBPR)
- Algae
- Purple non-sulfur bacteria
- Adsorption/Ion exchange
- Chemical precipitation
- NF/RO

Release

- Anaerobic digestion
- Aerobic digestion
- Thermolysis
- WAS release
- Sonication
- Microwave
- Chemical extraction



Figure 9b: Deammonification

Resource Recovery

Land application of biosolids represents resource recovery practices that are widely used. Resource recovery in WRRF of the future takes this further by implementing approaches for recovering nutrients and other value-added products. The following is a brief description of some of the projects in Water Environment & Reuse Foundation's (WE&RF) resource recovery portfolio.

Extractive Nutrient Recovery (Project # NTRY1R12)

While municipal wastewater contains nitrogen and phosphorus, the concentrations are too low for efficient extraction directly form the influent. The most viable approach involves a three-step framework:

• Accumulation of nutrients to high concentrations

• Release of nutrients to a small liquid flow with low organic content

• Extraction of nutrients as a marketable chemical product

A review of Figure 10 reveals that WRRFs that employ EBPR (accumulation step) and anaerobic digestion (release step), can recover nutrients by adding the last extraction step for struvite crystallization. Table 2 compares the proven extraction technologies that

Crystallization

Extraction

- Electrodialysis
- Gas permeable membrane and absorption
- Gas stripping
- Solvent extraction

Figure 10: Three-Step Framework for Nutrient Recovery

Factor	Ostara	Multiform Harvest	Phospaq	Crystalactor	Airprex	NuReSys	
Type of Reactor		Fluidized b	Completely Stirred Tank Reactor				
Point of Recov- ery	Dewatering centrate/filtrate				Digested sludge	Digested sludge; centrate/filtrate	
Product	Crystal Green®	Struvite	Struvite	Struvite	Struvite	BioStru®	
Removals	80-90% P Removal;						
	10-40% Ammonia-N Removal						

Table 2: Comparison of Proven Nutrient Extraction Technologies

recover nutrients primarily as struvite, a marketable slow-release fertilizer.

Recovery of Carbon and Other Commodity Products (Project # NTRY3R13)

This WE&RF project focuses on non-nutrient products. As depicted in Figure 11, several product groups can potentially be recovered from municipal wastewater. Based on literature review, the following four product groups as the most promising candidates for recovery: volatile fatty acids (VFAs), polyhydroxyalkanoates (PHA) or bioplastics, alcohols, and products from microbial electrolysis cells (MECs). Volatile fatty acid production using fermentation of primary and RAS solids is a proven approach and is routinely evaluated as a means of enhancing EBPR reliability. The recovery of other product groups may become viable in the future depending on market demand, technology maturation, and economics.



Figure 11: Non-Nutrient Products that Could Potentially be Recovered from Wastewater (NTRY3R13)

Recovery P of Plasmids and Rare Earth Elements (Project #NTRY8R15)

Plasmids, are small rings of DNA that bacteria use to transmit information. Plasmids and their encoded genes have been used to improve a wide variety of biological and chemical processes. In addition, plasmids form the foundation for a variety of molecular tools and methods that support the biotechnology industry. Rare earth elements (REE) represent a group of 17 elements that have unique properties and serve niche functions in a variety of technologies in health care, renewable energy, electronics, transportation, and manufacturing. Despite the term, REE are quite common and are ubiquitous. They are diffused, rarely found in high concentrations that would make recovery economically feasible. To compound the issue, the current global supply of REE is restricted to a single country, which poses significant supply chain vulnerability. Recent research suggests that municipal wastewater is a reservoir of plasmids and REE. The focus of this WE&RF project is to quantify the amounts found in WRRF influent, review recovery routes, determine market value of the recovered product, and identify knowledge gaps.

Summary

This article outlines several approaches for managing carbon at WRRFs. The list is by no means all-inclusive. As shown in Table 3, some of the options are 'low hanging fruit' that can be implemented at relatively low cost. While others require moderate to high capital investment. If an option is identified under two cost categories (e.g. high and low), it means that site conditions would dictate which category it would fall under.

WE&RF is in the forefront of promoting resource recovery, which is reflected in its goal: *To transition the wastewater treatment industry to one focused on resource recovery with the vision that most, if not all, materials can be commoditized.* The Foundation has invested approximately \$1.55 million in its resource recovery challenge program. In addition, contractors and collaborators have committed over \$3 million of inkind support. Subscribers can download project reports at no cost from the WE&RF website: http://www.werf. org//

Conclusion

In order to cope with the practical realities of the 21st century and beyond, today's treatment approach focused on removing pollutants must give way to a new paradigm focused on recovering resources. This article provides a sneak preview of what the WRRF of the future could look like with respect to carbon management. As the wastewater industry prepares for the paradigm shift, we should consider the following:

As end-users, utilities will play a pivotal role in implementing disruptive approaches required for today's plants to evolve as production centers or biorefineries. Operational goals will include going beyond

Alternative	Driver	Low Cost (Low Hanging Fruit)	Moderate Cost	High Cost						
Energy Optimization										
Liquid Stream Modifications										
Carbon Harvesting										
CEPT	Emery Production	\checkmark								
Primary Effluent Screening	Emery Production		√							
Carbon Redirection (A/B process, Captivator™)	Emery Production			✓						
Coarse to fine bubble diffuser	Energy conservation		~	~						
MABR				 ✓ 						
Selector zone	Energy conservation	\checkmark	~							
Low DO operation	Energy conservation	\checkmark								
Short-cut N removal				✓						
Deammonification (Anammox)	Carbon & energy			 ✓ 						
Mainstream anaerobic treatment	savings			 ✓ 						
Hydraulic energy capture	Energy conservation			~						
Wastewater heat capture	Energy conservation			~						
Solids Stream Modifications										
Sludge Pretreatment	Energy production			 ✓ 						
Advanced Anaerobic Digestion	Energy production			✓						
Co-Digestion	Energy production	\checkmark								
	Nutrient Removal	I	I.							
P Removal	Regulatory compliance									
EBPR	Baseline process			✓						
Incorporate fermentation										
Active primary		\checkmark								
Off-line fermenter	Inadequate influent carbon			 ✓ 						
Mixed liquor fermentation		✓								
Purchased VFA			✓							
Supplemental chemical P removal		✓								
Full chemical P removal			✓							
N Removal	Regulatory compliance									
Conventional N removal	Baseline process			✓						
Shortcut N removal	Carbon & energy			✓						
Deammonification	savings			✓						
Resource Recoverv										
Extractive Nutrient Removal				✓						
Recovery of carbon-based products	Sustainability	Technology not well	developed; cost	unknown.						
Recovery of plasmids & REE	1	Technology not well developed; cost unknown.								

Table 3: Relative Cost of Carbon Management Alternatives 56

meeting limits to ensuring end-product quality and creating new markets. An enabling organizational culture is integral to this transformation.

Disruptive technologies and new practices inherently carry risks (financial, technological, regulatory, market, etc.). Components of an effective risk management plan include, but not limited to understanding emerging technologies, participating in collaborative research, industry-wide information sharing, innovative procurement procedures, and partnering with technology providers to share risk.

It is important to recognize that technology is not the barrier to change. Rather, it is the lack of a socio-technological methodology to select and implement the most sustainable solutions based on local factors. Successful projects require coordination with and support from a variety of stakeholders including customers and community members, regulatory and legislative staff, media representatives, environmental advocacy groups, and water industry professionals. Guest et al (2009) have proposed a model (Figure 12) anchored in sustained stakeholder engagement (inner loop) throughout the planning and design phase (outer loop).

WRRFs will have at their disposal many routes and several destinations with respect to carbon management. Since disruptive changes cannot be implemented overnight, utilities should embark on developing a roadmap for action, which should be reviewed and updated at least every five years to keep it current and on track.



Figure 12: A Model for Engaging Stakeholders (Guest et al. 2009) (Double-headed arrows represent workshops)

Samuel Jeyanayagam, PhD, PE, BCEE, WEF Fellow Dr. Sam Jeyanayagam is Vice President and Senior Principal Technologist at CH2M HILL. He has over 36 years of academic and consulting experience and has completed projects in seven countries. His areas of expertise include nutrient removal/recovery, disinfection, and biosolids processing.

He is Co-Principal Investigator of the WERF Nutrient Recovery project and served as Task Force Chair of WEF's special publication, The Nutrient Roadmap. He has written and presented over 160 papers and co-authored over 27 WEF manuals. Sam is on the Editorial Board of the Water Environment Research and Water Environment & Technology journals.

Sam was recently inducted as a WEF Fellow. He is a registered engineer and a Board Certified Environmental Engineer. Sam received his MS and PhD degrees from Virginia Tech.



CITY OF GENEVA FISH RESCUE

If they say a bad day fishing beats a good day at work, then what's a good day fishing at work?!

by Gary Hydinger, Superintendent, Geneva WWTP

Originally circulated as an email thread

What I felt to be an interesting story happened today at the Geneva Wastewater Treatment Plant. Our service often goes unnoticed or unappreciated until there is a disaster or terrible discharge. Actually, what we receive at our plant might be considered "waste" water, but that is definitely not what goes out. While OEPA issues permits with quality limits on our discharges, what drives those limits is the downstream uses of the water. Indeed, our most stringent limit is mercury and it is the effects of fish consumption on ducks that requires us to measure mercury in parts per trillion.

So we at Geneva Wastewater Treatment Plant offer the following pictures as nature's endorsement of our plants discharges. Photos were taken by Operator III, Brandon Averill, and pictured along with the fish is





Operator I,\ Mike Berry. The beginning action takes place in our "chlorine contact tanks" which are at the very end of our treatment processes. While we are not at the moment chlorinating our effluent, during the summer season these tanks provide extended contact time between organisms in the water and the chlorine we feed to disinfect. Throughout the year, though, some solids settle out in the bottom of these tanks and we clean them by pumping the contents back to the headworks of the plant for further treatment. When these two operators were cleaning tanks today, they noticed something moving as the water level dropped. The rest is pictured.

Our plant discharges water into Cowles Creek. For the steelhead to get into our chlorine contact tanks it:

1. Had to choose the quality water coming out of our pipe over that of the stream,

2. Swim 125' up inside this pipe,

3. Squeeze past the flapper valve—a round disk about 30" in diameter and weighing probably 100 pounds, open perhaps 4 to 5" wide by the pressure of our plant effluent being discharged.

4. Jump up a waterfall about, 3' high, and through a metal v-notch weir.

I can't think of a better sign of approval than the choices and efforts put forth by this fish and I offer this as a challenge to other treatment facilities.

> It was a beautiful sunny St. Patrick's morning at the Geneva Wastewater Treatment Plant. Operators Brandon Averill and Mike Berry were given the task of cleaning the chlorine contact tanks near the outfall pipe of the plant. While pumping down the east tank, Mike noticed something moving near the bottom and yelled for the pump to be shut down. What was found would turn out to be a 24" steelhead! Attempts were made to net the beast from above but to no avail. Mike then put on his trusty hip boots and descended into the tank, net in hand.

CITY OF GENEVA FISH RESCUE

Due to the slight sludge build up, tracking the elusive beast was difficult at best. It was then decided that a screen be placed around the pump's suction line and the level lowered more.

Finally success!

The beautiful steelhead was returned to Cowles Creek safe and sound!

This was the largest fish rescued at the plant to date. It goes to show that even the fish think the plant's effluent is cleaner and better than the creek!















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by Ohio Environmental Protection Agency

Jeff Beattie, Division of Air Pollution Control and Sherri Swihart, Division of Air Pollution Control

Risk Management Plan (RMP)

Ohio Revised Code Chapter 3753 Ohio Administrative Code 3745-104

Background:

The chemical accident prevention provisions in Section 112(r) of the Clean Air Act Amendments of 1990 require facilities that use, manufacture, handle or store certain chemicals to prepare and submit a Risk Management Plan (RMP) to U.S. EPA.

The goal is to maintain safe facilities that take steps to prevent/reduce releases and to minimize the consequences of accidental releases which do occur.

Ohio received authority to implement the RMP program from U.S. EPA in January 2000. The Ohio legislature adopted Ohio Revised Code Chapter 3753 and Ohio Administrative Code 3745-104 rules were passed. Ohio has approximately 410 statewide reporting RMP facilities, 60 of which are from the water/wastewater treatment sector.

The RMP-specific listed chemicals, consisting of toxic and flammable substances, can be found in 40 CFR part 68. Publicly owned wastewater and water treatment works (POTWs) or industrial treatment systems may have to comply with 40 CFR part 68 due to their use of chlorine (2,500-pound threshold), anhydrous ammonia (10,000-pound threshold), aqueous ammonia greater than 20 percent concentration (20,000-pound threshold)



Chlorine Storage

and sulfur dioxide (5,000-pound threshold).

The RMP program places regulated facilities into one of three program levels. A facility reports under RMP if: (1) it has one or more regulated substances; (2) the listed substances are in quantities that exceed the threshold for that chemical and (3) the chemicals are in a process (defined as any activity involving the regulated substance, including any use, storage, manufacturing, handling or on-site movement or any combination of these activities).

Ohio's wastewater and water treatment plants are often subject to the RMP program due to chlorine stored in multiple one-ton cylinders. Cylinders stored or in use together are considered a process and therefore, having more than one cylinder on site at any one time would exceed the 2,500-pound threshold.

The RMP program requires facilities to develop and implement safe business practices to identify hazards, manage risks and file a risk management plan with U.S. EPA. In Ohio, all of the current RMP-reporting wastewater and water treatment facilities are classified as RMP Program Level 3 facilities due to: (1) the established distance endpoint of the off-site consequences to affected residential population and (2) being subject to the OSHA's Process Safety Management (PSM) standards (29 CFR 1910.119). The PSM standard is a set of procedures in 13 management areas designated to protect worker health and safety in case of accidental releases.

POTWs comply with OSHA standards under the state's Public Employee Risk Reduction Program (PERRP). If you are already complying with PSM standards, then most likely you will need to take few, if any, additional steps or provide additional documentation to meet the RMP Program Level 3 requirements.

RMP Program Level 3 includes: management responsibilities; hazard assessment; process safety information; process hazard analysis; operating procedures; training; mechanical integrity; management of change; pre-startup review; compliance audit; incident investigation; contractors; and emergency response plan requirements.

Facility RMPs are submitted online to U.S. EPA using a system called RMP*eSubmit, which can be accessed at *epa.gov/rmp/rmpesubmit*. A covered facility must initially register as a preparer and/or certifier in the Central Data Exchange (CDX) *cdx.epa.gov/CDX/*. Once you are registered and create an RMP for your facility, you will receive a 12-digit facility RMP ID number. U.S. EPA has a reporting help desk at (703) 227-7650.

Questions to Ask:

Step 1: Does my facility have one or more of the listed RMP chemicals found at *epa.gov/rmp/list-regulated-substances-under-risk-management-plan-rmp-program*

Step 2: Does my RMP chemical(s) as listed exceed the threshold quantity (in pounds)?

Step 3: If the answer to (1) and (2) is yes, then is that RMP chemical in a process? Under RMP, a process is any activity involving the regulated substance, including any use, storage, manufacturing, handling or on-site movement or any combination of these activities.

Step 4: If the answer to (1), (2) and (3) is yes, then you must complete an off-site consequence analysis to determine the distance to an endpoint where the toxic vapor cloud, fire or explosion from accidental release will travel before dissipating to a point that serious injuries from short-term exposures will no longer occur.

RMP*Comp (*epa.gov/rmp/rmpcomp*) is a free program you can use to complete the off-site consequence analyses (both worst-case and alternative scenarios).

Example Scenario:

City Water Treatment Plant has chlorine (CAS number 7782-50-5) in four one-ton cylinders totaling 8,000 pounds on site. This represents two full one-ton cylinders being connected simultaneously and two full one-ton cylinders for backup. This amount exceeds the 2,500-pound threshold for RMP. The RMP*Comp program is used to complete the off-site consequence analysis and generate a worst-case scenario distance to endpoint at 1.30 miles (13,401 estimated residential population affected at the endpoint) and an alternative release scenario distance to endpoint at 0.1 miles (100 estimated residential population affected at endpoint).

Based on the RMP*Comp program results, and since the treatment plant falls under the OSHA PSM requirements or the state's PERRP, the plant is placed in the RMP Program Level 3 and now has regulatory responsibilities.

State RMP Program:

Ohio's RMP program is housed within Ohio EPA's Division of Air Pollution Control (DAPC). The program has two employees who review RMP submittals and conduct site audits.

When a facility submits its RMP using the RMP eSubmit software, that original submittal date is considered their RMP reporting anniversary date. The RMP report must be submitted every five years, unless the facility has a major process change or an RMP chemical spill or release. U.S. EPA mails five-year reminder letters with subsequent 30day late notices. Ohio EPA reviews the RMP submission prior to scheduling a site audit/inspection using the onsite risk management audit checklist developed based on the specific program level of the facility.

Upon completion of the audit/inspection, the facility receives a letter of compliance or a notice of violation (NOV). The NOV identifies violations observed and instructs the facility to correct them. Facilities receiving NOVs should work with the inspector to ensure that the violations are addressed. Failure to address identified violations can result in enforcement. Common violations include, but are not limited to: (1) not completing the recommendations from the process hazard analysis; (2) not reviewing operating procedures on an annual basis; (3) not conducting refresher training every three years; (4) not implementing a regular scheduled preventative maintenance program according to API standards; (5) not maintaining contractor programs; and (6) not maintaining the required documentation.

Ohio EPA-RMP Contacts:

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Kim Joseph (614) 644-2187 or Kimberly.joseph@epa. ohio.gov

References:

epa.gov/rmp — U.S. EPA guidance and links to assist RMP activities and RMP*Comp software

epa.ohio.gov/dapc/atu/112r.aspx — information about Ohio's RMP program, including industry-specific guidance for water and wastewater treatment facilities

epa.gov/rmp/guidance-facilities-risk-managementprograms-rmp — general RMP guidance, including Appendix F: Supplemental Risk Management Program Guidance for Wastewater Treatment Plants





Towards a Common Vocabulary & Understanding Related to Stream Flow, Floods, & Other Tidbits

by Northeast Section Watershed Group

It starts out "But this was a 100-year flood, it hasn't been 100 years yet". We have all heard this or may often wonder about it. What is a 100-year flood, how often does it happen? As water-based professionals many of us hear questions like this, are you prepared to answer them?

A watershed is dependent on two things: water and land. The interaction between the two is very complicated and can be tremendously influenced by human activity. Think of a dam for example and the consequences of its construction, or how about dredging a stream as another, does it really make things better? As we have developed and altered our landscape we have tremendously altered the pathways that delivers water to its receiving stream or lake. These changes have ecological and societal impacts that can result in loss of property, possessions, and even life on a human scale.

If we think of one of the simple drawings of a water



Figure 1



Figure 2

cycle, such as the one presented in Figure 1 (Source: https://pmm.nasa.gov/education/interactive/watercycle-webquest) we see that the cycle begins with precipitation leading to evaporation and transpiration followed by precipitation again. So, how can we define a rain event? A simple question with many answers. In the professional world of engineers and hydrologists we often see terms like the 10 Year 24-hour storm or the 100vear flood, do we really understand them? They are both based on statistical frequency analyses which looks at the probability of an event happening in a year. Thus a 100year flood has a 1% chance of happening in any one year a 25-year flood has a 4% chance of happening in a year. This is tightly tied to the rainfall frequency which was presented in a paper over 50 years ago (Technical Paper No. 40, Rainfall Frequency Atlas of the United States, for Durations from 30 Minutes to 24 Hours and, Return Periods from 1 to 100 Years, Engineering Division, Soil Conservation Service, U.S. Department of Agriculture, May 1961). If you live in Cleveland, the expected amount of rain to fall in a 10-year 24-hour storm event is 3.5 inches while in Cincinnati the expected rainfall would be 5 inches (Figure 2, modified from Technical Paper No. 40). If you are interested in exploring this further check out the watershed hydrology model on the USDA's web site:

http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/ national/water/manage/hydrology/?cid=stelprdb1042901.

Storm water enters streams and other bodies of water and it is logical to assume that more rain creates greater stream flow. It is possible, however unlikely, to have multiple 100-year floods in a single year. If Monday the chance of having a flood is 1% and you get one then Tuesday the chance is also 1% and you could have another, it is purely a statistical interpretation.

So why does it seem that floods get worse every year as some will say. Here lies the rub, and one can answer this in many different ways. As our climate changes so does the delivery of water through rain events. Intensifying storm events may result in the future need to reevaluate the current frequency analysis assumptions. A flood as defined by Webster: a large amount of water covering an area of land that is usually dry, while the definition of a floodplain is: an area of low, flat land along a stream or river that may flood. If you build in a floodplain the chance of being flooded is highly likely as compared to building on a hilltop. Yet we continue to do so, "the 100-year flood happened two years ago so I should be good". We spend millions of dollars each year reacting to property damage caused by intrusion into the floodplain.

Earlier it was mentioned that we can alter our

landscape and this is very important in terms of how we interact with streams. As we change our landscape by development, we also alter the way water is delivered to a stream. As shown in Figure 3 (from US EPA, https:// cfpub.epa.gov/watertrain/moduleFrame.cfm?parent_ object_id=170#), an increase in impervious surfaces result in greater runoff and less infiltration. That little brook next to someone's house can rapidly become a raging torrent as we continue to remove native vegetative cover and replace it with roads, buildings, and parking lots. The common statement of "it never got this high before" is probably true. However, there has been a change in landscape and increase in storm intensity. The best defense against flooding is to not build structures that can be damaged in the floodplain.

This brings us to the most unlikely of victims in this little story, the stream. Our streams have been subjected to chemical pollution and physical alteration over the years. Given a little bit of help they can recover quite nicely, although the definition of a little help can be quite expensive. A floodplain is crucial to the proper physical health of our stream. High flows in a channel impart high energy to the system. If improperly managed this energy results in increased erosion. Think of flooding as a natural component of stream life. It will rain, it will cause stream flows to increase, it will cause flooding. As people we all manage stress differently. When stressed some of us gravitate towards the television with a bag of chips (not the healthiest) while some of us may choose to exercise (a healthier choice). The stream that is has access to its floodplain is parallel to the healthy choice of exercise. Energy is dissipated over a larger area resulting in decreased velocity which reduces erosional force (yes, it is all about math). Consider this natures grit chamber, possibly why we developed farming in the rich soils of river floodplains. When stream energy is not allowed to dissipate, as a result of disconnection from the floodplain by dredging for example, the streams energy increases (more math) resulting in erosion. The stream is attempting to recreate a floodplain by lateral

erosion in hopes of restoring a channel capable of properly managing flow and energy, often the "where did my vard go" scenario. A channel evolution model was originally proposed by Schumm and Parker in 1973. The model has been modified over the years but it's basic premise remains the same as shown in Figure 4. A stream once altered will attempt to rebuild its floodplain by lateral incision. When not able to access a floodplain this erosion is an attempt to create a new floodplain and can result in losses of yards, buildings, and roads. Think of all the money spent by communities and individuals in an attempt to curb or stop the process of channel evolution. A healthy respect for water and the power of erosion can go a long way. However, it is definitely easier to talk or write about than change zoning codes or fight lengthy court battles over property rights.

All is not lost however. As we continue to increase our knowledge it has resulted in changes. Broader understanding of these processes are being seen in some zoning- riparian setbacks for example place a value on this natural area. Floodplain management groups are now looking at the acquisition of properties in highrisk flood zones. Much stream restoration today uses the concept of natural channel design, recognizing the advantages of how unaltered streams function. Each of the paragraphs or even sentences above have had papers and books devoted to them. Any attempt to do more than gently skim the surface of these topics would not be possible here. If it did inspire you learn a little more feel free to check out some of the many books on these subjects. A personal favorite is A View of the River by Luna Leopold. Yes, he was the son of Aldo Leopold and also considered as one of the pioneers of the field of fluvial geomorphology. If you are feeling brave read Fluvial Processes in Geomorphology coauthored by Leopold, Wolman, and Miller, the classic book describing fluvial processes (more math). If you are in the mood for a well written comfortable read check out Wildstream: A Natural History of the Free Flowing River by Thomas Waters or Water: A Natural History by Alice Outwater. Learning and understanding any subject is a great first step to improving ourselves and sharing with others.



Figure 3

a Broked Chornel

Figure 4



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US EPA UPDATE

Western Lake Erie Area Committee Ohio Mapping Project

by John Gulch, USEPA, Region V

The Western Lake Erie Area Committee (WLEAC)-Ohio Mapping Project Geographical Information System (GIS) program is an environmental emergency response tool that brings public (federal, state and local) and private sector emergency responders together, working in one GIS format for spill response and pre-planning. During an emergency response, federal and state On-Scene Coordinators (OSCs) use the project to gain situational awareness of downstream/downwind vulnerabilities, as well as upstream/upwind potential responsible parties. For contingency planning, the project can introduce facilities to the communities which may be impacted during a hazardous materials and/or petroleum release. The program can also be used during exercises of facility response plans by providing participants access to response layers such as: endangered/protected species and habitats; sanitary and storm sewer systems; facility discharge and permit discharge points; water supplies; other pollution sources (facilities, oil wells, pipelines, rail lines, etc.); and vulnerable populations (schools, nursing homes, daycare facilities, hospitals, etc.). The entire program is hosted on a secure federal government server with redundancy. More information can be found at this link: www.rrt5.org, (Interactive Mapping Tab).

One of the end products of pre-planning is the development of spill containment sheets by environmental emergency responders through the determination of locations that provide the best containment/product collection sites, staging areas and monitoring sites. Using the other GIS layers in the project to view inland sensitivity data (such as water intakes, wetland areas, vulnerable population, etc.), data sheets can then be developed for sites downstream of pipelines, rail lines, fixed facilities, etc. based on environmental risk. The information is best collected by the facilities which are associated upstream from the specific watershed containment locations, and the collected information confirmed by environmental emergency responders who may need to use the containment information during a response. Once the information is collected and data sheet completed, it is verified and loaded on to the project linked to its GPS coordinates.

The newest version includes the ability to access the project via the iOS platform. This upgrade to JAVA-based technology enables responders to utilize any model of smartphone or tablet to access valuable information in the field. In the future, the WLEAC would like to add municipal sanitary and storm layers for all applicable jurisdictions. This is best accomplished via sharing HTTP:// hosted data with the EPA GeoPlatform, which allows for real-time upgrades/updates without the need to share new data. This is where you, the utility contacts, come in.

For more information, or to submit GIS maps of your sanitary and/or storm sewer system, please contact: Ohio EPA OSC Mike Gerber at (419) 373-3031 or mike. *gerber@epa.ohio.gov*; U.S. EPA OSC Jon Gulch (734) 740-9017 or *gulch.jon@epa.gov*; or any member of the Western Lake Erie Area Committee.



Photo of the Ohio Mapping Project. Municipal Sewer System Layer.

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