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INSIDE:

2021 Mid-Year Conference Recap | In Memoriam - Paul Krauth



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Trevor Lindley

Saying Goodbye to 2021

The WEAU Board was excited to see many of you at recent events including the Engineering Symposium (held in September) and the Mid-Year Conference (held in November). With the COVID-19 challenges, it had been two years since meeting in person in much of a group. If you recall, we had to cancel the Annual Conference in April 2020, the Mid-Year Conference in November 2020, and transition to virtual for the Annual Conference in April 2021. Being back in person was really great and we could feel the energy in the room. The Board appreciates everyone who came. We also recognize that face masks are a pain (and I don't think anyone really likes to wear them) so the Board does appreciate the high level of face mask-wearing that we had at Mid-Year Conference to support increased safety of those in attendance.

It is with sadness that we say goodbye to Paul Krauth who passed away on September 20, 2021. The Board would like to thank everyone who contributed content to Paul's memorial video which was shared at the Mid-Year Conference and special thanks to Leland Myers, Jill Jones, and Manjot Masson for pulling the tribute together.

For me, the key take-away messages from Mid-Year Conference include:

- The benefits of meeting together are strong when we can safely make it happen.
- The continued need and urgency to learn from all the experienced people who have been part of the industry for a long time.
- Seeing lots of new faces that bring fresh energy to the organization.

I was able to attend the 'after party' at Olive Garden for the young/rising professionals. We had a great turnout! About 20 WEAU members were able to mix and mingle a bit over dinner and it was really fun to see the next generation start to build their network. As President, it's an honor to be part of such a great organization; one that quietly and with little fanfare anchors public health and environmental protection. You should all be proud of what you do.

Mark your calendars for April 12-15, 2022, for the Annual Conference. We're planning for in-person attendance in St. George!

Trevor Lindley
President WEAU [DA](#)

“ Being back in person was really great and we could feel the energy in the room. The Board appreciates everyone who came.





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COVID-ISMS

Bryan Mansell

One of my favorite things about the Thanksgiving and Christmas holiday season is the opportunity to slow down a bit and reflect more carefully on my life and experiences over the past year. This year, acknowledging that COVID-19 will most likely become endemic (like the flu), I've been thinking about what I've learned and what has changed in society since the pandemic began. COVID-19 has certainly done a lot of things to us as a people, but what has it done for us? Aside from forcing everyone to become more technology-savvy, blurring the line between home and work life, revealing the true value of toilet paper, and pulling our ears forward a little, I think COVID-19 has given us a slightly new vocabulary. I'm guessing the next generation won't appreciate the novelty of so many

uncommon terms and phrases (that I call 'Covid-isms') suddenly bursting into public conversation. You probably use many of these terms daily, but we seldom or never did two years ago. Here's a few that come to mind:

- Social distancing, social distance, physical distancing
- Moderna
- Quarantine
- Mask mandate
- Abundance of caution
- Intubation
- Ventilator, respirator
- Asymptomatic
- Contact tracing
- Essential workers
- Herd immunity
- Lockdown
- Incubation period

- Super-spreader
 - N95 mask
 - Six feet (and its relevance as a threshold)
 - Six months (and its relevance to vaccination status)
 - Zoom call
 - Working from home
 - In-person meeting
 - CDC guidelines
 - Pandemic (obviously)
 - Open for dine-in
 - Face shield
 - PCR test
 - Antigen test
 - "(Fill in the name), you're muted!"
- So, like yin and yang, the increased frequency of four-letter words over the past 20 months is balanced with expansion of our collective vocabulary. [Dn](#)



DIGESTED news

NEW THIS MONTH!

Find the Hidden Golden Sludge Shovel!*

WEAU is starting a new tradition with *Digested News*. Each quarter, *Digested News* will have this golden sludge shovel icon hidden somewhere in the content of its pages.

Be the first to find it and email the editor (DigestedNews@WEAU.org) the correct page number to win a \$25 Amazon Gift Card.

Emails should include:

- Subject: I found the golden shovel
- Correct page number
- Your name and work address

Winners will be notified directly and named in the next issue of *Digested News*.

*For those of you new to WEAU, volunteers who give notable time and service to WEAU are awarded a "5S" golden lapel pin shovel. With that award, they become members of the **Select Society of Sanitary Sludge Shovelers**. WEAU is always looking for volunteers and maybe one day, you too can become a 5S member. [Dn](#)



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Certification Preparation Quiz

By Dan Olson

1. **Your pretreatment coordinator calls and tell you a large quantity of acid was discharged to the sewer. How will you know when it reaches the plant?**
 - a) The DO in the raw wastewater would exceed the saturation value
 - b) The pH of the raw wastewater would rise
 - c) The pH of the raw wastewater would decrease
 - d) The volatile portion of the SS would be greatly increased

2. **The Norbeast processing plant starts discharging large quantities of feathers that interfere with the satisfactory operation of the plant. The operator should first _____.**
 - a) Notify the State Regulatory Agency
 - b) Call the local police
 - c) Phone the poultry house and order them to stop at once
 - d) Call the poultry house, explain your operating problems, and offer to cooperate with them in working out a satisfactory solution

3. **If the pH of plant influent changed suddenly at the same time of day each week, a probable cause would be _____.**
 - a) Industrial users discharge
 - b) Septic haulers dumping septic tanks into sewers
 - c) Grease traps at the casinos being bypassed
 - d) Hydrogen sulfide production at a lift station

4. **Which method of financing sewer installation would affect the most people in the community?**
 - a) Industrial waste service charges
 - b) Business and occupation tax
 - c) Sewer charges based on water usage
 - d) Local Improvement District

5. **Which of the following would be a legitimate reason for bypassing the plant?**
 - a) An extended power outage, causing loss of influent pumping
 - b) Broken shaft on digester mixer
 - c) Flows in excess of influent line capacity
 - d) Ruptured line between comminutor and primary clarifier
 - e) None of the above

6. **The testing frequency for a discharge permit _____.**
 - a) Is fixed arbitrarily by the state authorities
 - b) Depends on the type of treatment process and local conditions
 - c) Is the same for all plants
 - d) Once established should be continued each day without change despite varying local conditions

7. **Neighbors complain of excessive odors emanating from the plant. What should an operator do?**
 - a) Tell neighbors you have no control over odors
 - b) Use larger quantities of lime to sweeten the raw sludge
 - c) Identify and control the cause of odors
 - d) Use commercial masking agents

8. **The best approach to complaints involving the operation of a wastewater plant is to _____.**
 - a) Never admit there is a problem or cause for complaint
 - b) Keep all persons except operating personnel out
 - c) Publicize the problem as much as possible
 - d) Explain the problem and proposed solution and offer to conduct the ones making the complaint through the plant

9. **What is safe environment for a confined space.**
 - a) Oxygen greater than 23.5
 - b) Oxygen less than 23.5
 - c) Oxygen between 19.5 and 23.5
 - d) Oxygen greater than 19.5

10. **To determine the efficiency of a clarifier, use a _____ test.**
 - a) BOD
 - b) Settleable solids
 - c) Dissolved solids
 - d) Total dissolved solids

ANSWERS: 1. C, 2. D, 3. A, 4. C, 5. E, 6. B, 7. C, 8. D, 9. C, 10. B.



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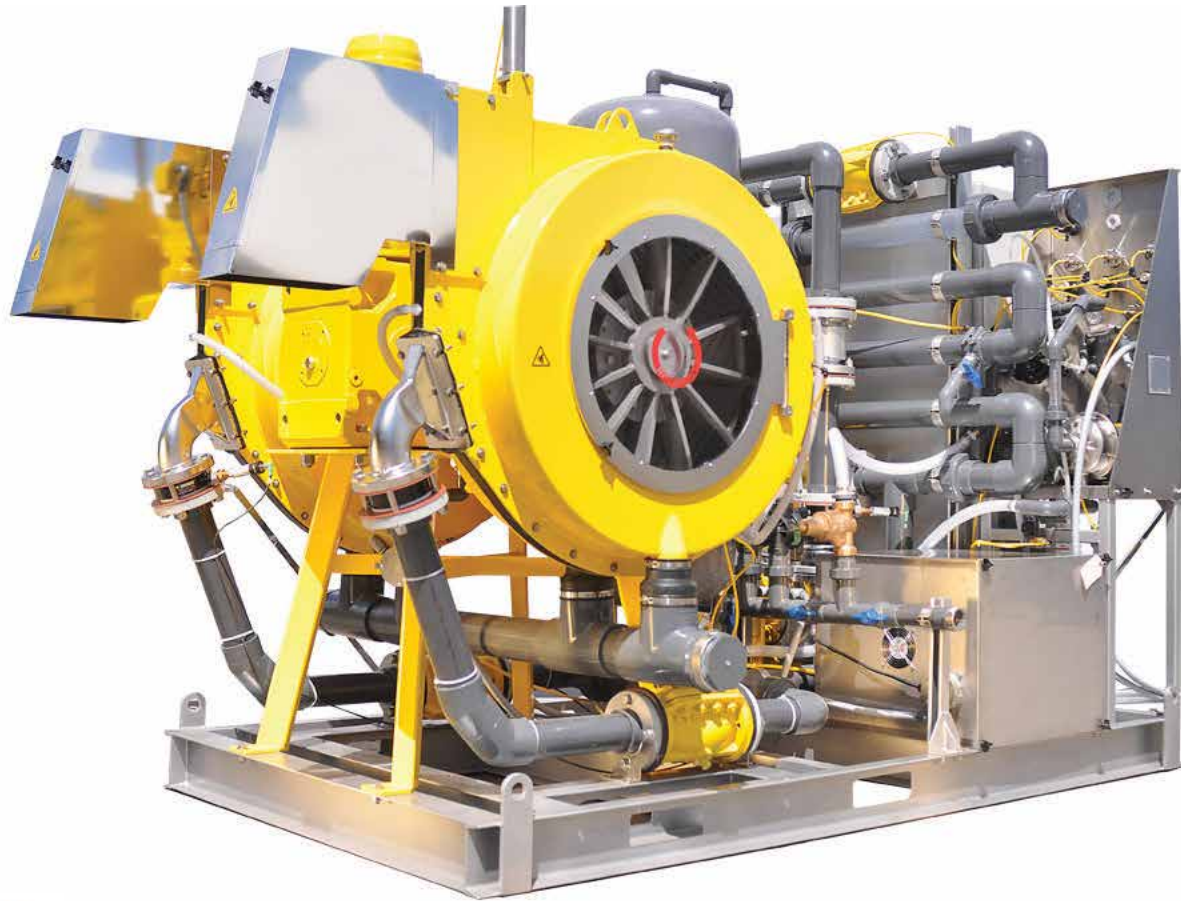


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2021 Mid-Year Conference Recap

West Valley Cultural Celebration Center

November 16, 2021



Thanks to all those who attended WEAU's 2021 Mid-Year Conference, and thanks to all those who made it possible.

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Tiffini Adams
Dustin Lewis
Daniel Watts
Amanda Stoudt (YPs)
Ryan Bench (Student Outreach)
Korey Walsh (Website)
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Significant 'Behind-the-Scene' Volunteers

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Thanks, as well, to our 2021 Platinum Sponsors



2021 Mid-Year Conference Recap

Conference Highlights



Bob Okey Scholarship Award Winners Courtney Bauer and Hadley Young.



Dan Watts and Dustin Lewis Report on WEAU's Ops Challenge Teams at WEFTEC.



El Presidente Trevor Lindley Addresses the Conference Attendees.



Eric Price's hidden smile shows he is happy to be meeting in-person again.



Hadley Gunn waxes philosophical.



Leland Myers Pays Tribute to Paul Krauth.



Ops Challenge Teams Recognized for Their Achievements.



Trevor Lindley and Sarah Ward Recognize WEAU Operator and Professional Scholarship Winners Josh Donegan, Ben Ford, and Sam Odd.



WEAU Members Attend the Conference Luncheon.



Young and Rising Professionals Meet for Dinner and Networking.

Get Involved!



2021-2022 ORGANIZATION CHART

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Paul Krauth




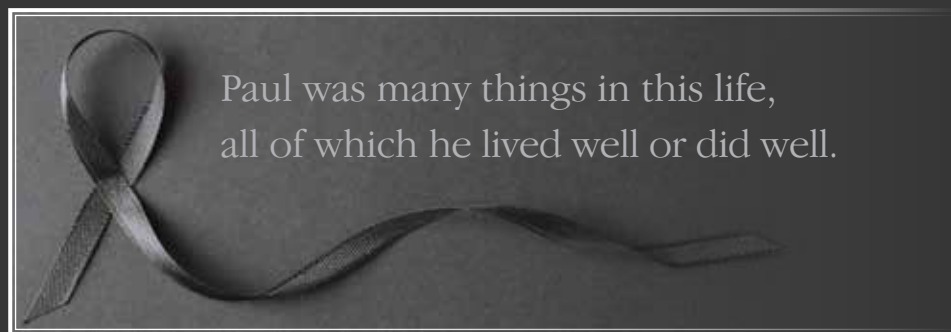
The activated sludge training in heaven was kicked up a notch on September 20, 2021 when Paul Krauth “got the P out” of this worldly realm. Paul was welcomed to the other side by his parents, Carl and Marilyn, and 17 hungry cats. As anyone who knows Paul can guess he showed up there at lunch time ready for a good meal, with a good story about how he snuck out of this life without anyone catching him.

Paul was many things in this life, all of which he lived well or did well. He graduated from the University of Utah in Engineering, either mechanical or environmental depending on which resume you read, and other degrees that may have also been mentioned in those resumes. He played center on the “U” football team, which anyone could have guessed because he loved being the center of attention. He began his career as a Professional Engineer and worked for the State of Utah in Water Quality. He held many job titles, but the one he cherished was his role as an on-site trainer for wastewater facilities. Paul was dedicated to helping facilities avoid problems and helping operators pass required certification tests. Hundreds of Utah certified operators, and perhaps thousands nationwide, can attest to his training skills.

Paul was involved in many professional organizations including the Associated Boards of Certification, Water Environment Federation, Water Environment Association of Utah, and multiple training organizations. Paul was the president of the Water Environment Association of Utah where he held the all-time record for spending money and is fondly remembered for the Annual Conference, where the food was fantastic. Paul knew every nationally renowned wastewater expert and was just “one of the boys” in that club.

Paul received many awards in his lifetime but the one he always included on his resumes was for being the five-time winner of the “clean lunch plate” award at Hillview Elementary School. Paul was branded by Bob Okey (one of those wastewater experts) as the “World’s Greatest Hedonist,” but was also known as a caring friend, a brilliant mind, a dedicated servant of the public good, and a hometown hero to many. He will be missed, but fondly remembered.

A celebration of Paul’s life was held at Central Davis Sewer District on Friday, October 1, 2021. The event took place between 11:00 am and 2:00 pm and all were encouraged to bring their favorite picture and memory. Of course, food was provided and it was high in carbohydrates, loaded with fat, a bit of protein, and all the stuff Paul loved. 



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WEAU Attends Ops Challenge in Chicago

By Daniel Watts

2021 is the first year since 2019 that WEAU has been able to compete in the Operations Challenge and we all know why.

WEAU was so excited to be able to send two all-star teams to WEFTEC 2021 in Chicago to compete. These teams worked hard for months to prepare for the events in Chicago. For the majority of participants, this was the first time they competed. Both teams were made up of composite participants from entities from around the great state of Utah

Our teams did amazingly well. The Wasatch All-Stars (WAS 2) took 9th overall and the Wasatch All-Stars Utah torque took 8th overall with a 3rd place finish in the safety event. They received amazing support from all WEAU attendees from all the entities in Utah. Team participants would also like to express their gratitude for the wonderful support from their employers.



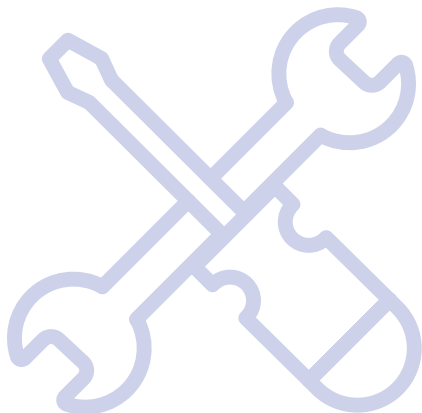
Our Utah Teams: Wasatch All Stars Utah Torque (Left) and Wasatch All Stars/WAS 2 (Right).

Wasatch All Stars Utah Torque

8th Overall
3rd in Safety

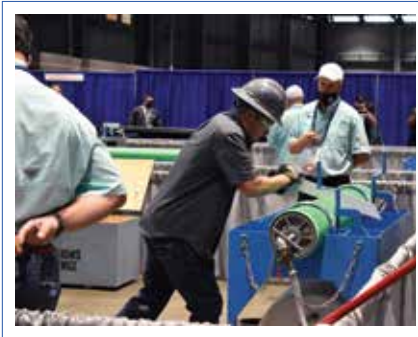
Wasatch All Stars WAS 2

9th Overall

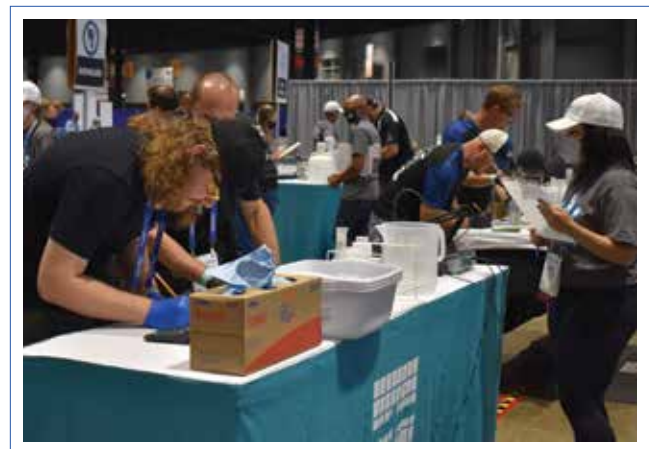


Safety Event Practice Location at Central Valley Water Reclamation Facility.

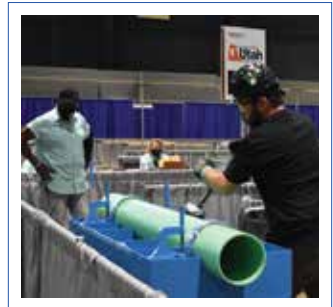
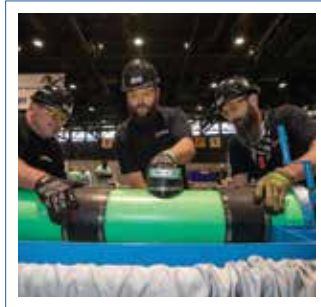
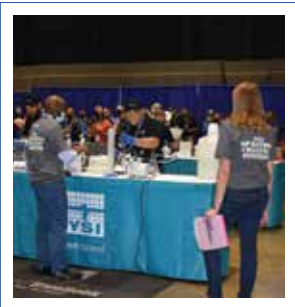
Wasatch All Stars Utah Torque



Wasatch WAS 2



Wasatch WAS 2 *continued*



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Harmful Algal Bloom and Cyanotoxin Production

By Ruchi Agarwal, Rowland Hall High School
and Ramesh Goel, Professor, University of Utah

The formation of harmful algal blooms, or HABs, is one of the negative consequences of surface water eutrophication. In the US alone, HABs result in losses of recreational, drinking water, and agricultural water resources worth an estimated \$2 billion annually. Globally, there has been an increase in the extent, frequency, and magnitude of Harmful Cyanobacterial Bloom (HAB) events over the past three decades (Anderson et al., 2011; Gupta et al., 2013). Nutrient enrichment to surface water bodies has been highlighted as one of the main driving forces for eutrophication by several past studies. Most HABs occur in lakes, estuaries, or regulated lowland rivers and are planktonic species. The data so far shows that microalgal species considered HABs contains about 80 toxic species and, nearly 200 harmful species out of an approximate total of 4000 marine planktonic microalgae. The increase in blooms of some HAB is primarily the result of eutrophication. The increase in the magnitude, frequency, and distribution of harmful algae within the past decade has focused attention on the unique physiological, ecological, and toxicological perspectives of the HABs. While the toxic effects associated with some harmful algal bloom (HAB) species are constrained to local environments, other species appear in areas previously unprecedented. Many HAB species are thus becoming endemic in regions where no previous observations exist. Most species of algae are not fatal, but certain types of algal bloom in surplus amounts can cause harm to human health. These harmful algal blooms (HABs), usually recognized as algae that produce toxins, cause fatal problems to humans and animals. Even though they are termed bacteria and cyanobacteria, they exhibit as algae and are associated with HABs. Cyanobacteria harvest light energy using various pigments, including chlorophyll *a*, phycobiliproteins, and carotenoids. Several hydraulic and physicochemical parameters related to benthic and planktonic cyanobacteria have resulted in creating ecological interactions and strategies for cyanobacteria growing in each environment.

“Cyanobacteria produce a range of diverse, low molecular weight and highly toxic molecules, which can adversely affect numerous eukaryotic biochemical mechanisms.”

Cyanobacteria produce a range of diverse, low molecular weight and highly toxic molecules, which can adversely affect numerous eukaryotic biochemical mechanisms. The known cyanobacterial toxins are generally classified into three groups: hepatotoxins, neurotoxins, and irritant toxins. The hepatotoxins include two groups, cyclic peptides and guanidine alkaloid hepatotoxins. The cyclic peptides are microcystins and nodularin: heptapeptides and pentapeptides, respectively. In mammals, the microcystins and nodularin react by destructing the liver macrostructure through the deformation of hepatocytes so that blood can pool in the liver. The assumption that microcystins can function as tumor promoters in a human population exposed to these toxins was raised by Ueno *et al.* (1996). Due to their ability to inhibit the enzyme and then allow it to resume its activity, such cyanobacterial toxins can potentially be defined as carcinogens in the future. Again, due to the planar nature of the cylindrospermopsin molecule, the possibility exists that this compound may interact with DNA. This molecule, as such, can potentially play the role of a carcinogen. The neurotoxins produced by cyanobacteria comprise a group of alkaloids. They are more commonly known for their habitat in marine waters, where dinoflagellates are making them. They may cause shellfish poisoning in environments where bivalve mollusks concentrate the toxin-producing algae in the hepatopancreas. Species like Aphanizomenon, Cylindrospermopsis,



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Anabaena, and Planktothrix produce toxins in the aquatic environment. The anatoxins can be divided into two unrelated alkaloid toxins, anatoxin-a, and anatoxin-a(S). Anatoxin a is a nicotinic acetylcholine mimic. This cyanotoxin has structural similarities to cocaine and has resulted in several animal toxicoses, including dogs and birds. Anatoxin-a(S) is a naturally occurring organophosphate. The S denotes hypersalivation, which, along with lachrymation, is indicative of poisoning with acetylcholinesterase inhibitors. Microcystins and nodularin inhibit protein phosphatases. So, this mode of action was used as the basis of analytical methods for their detection. After toxicology assessment of anatoxin, it was found that this alkaloid binds to acetylcholine receptors at neuromuscular junctions and can bind to nicotinic acetylcholine receptors in *Torpedo ocellata* tissue (Aronstam and Witkop, 1981). This method is being used as an analytical method to detect anatoxin-a in cyanobacterial extracts using competition assays with radiolabelled- and non-radioactive-acetylcholine inhibitors.

Many environmental factors control the composition and bloom development of the phytoplankton species. Among these factors, the composition of the nutrient pool, the forms of the nutrients supplied, and the relative abundance of the major nutrient elements are observed to have immense importance. However, the contribution of N and P to eutrophication cannot be disputed, and the conventional paradigm

has suggested the exogenous input of nutrients to surface water bodies trigger eutrophication and leads to HABs. Although other factors such as meteorology, hydrology, and top-down effects of zooplanktons are essential, the role of nitrogen and phosphorus cannot be denied. As most phytoplankton could manage carbon sources by carbon-fixation and photosynthesis, nitrogen (N) and phosphorus (P) become the two most essential nutrients in the aquatic environment though their relative contribution has always been debated. Although exceptions to generality exist, P limitation in freshwater lakes, N limitation in many estuaries and marine ecosystems, and co-limitation in open ocean systems have been observed. With time scale, ecosystems can switch between N or P limitations.

Traditionally, primary production in freshwater systems has been viewed as limited P, and measures to restrict P input in lakes were successfully taken in the 1970s. N was more noted as a limiting nutrient in the last decades due to the cooccurrence and dominance of non-diazotrophs (e.g., *Microcystis* and *Planktothrix*) in harmful algal blooms with the enhancement of N loadings. With a low N:P ratio, N₂ fixing cyanobacteria could become dominant in lakes. Although these findings suggest that the actual concentrations of nitrogen and phosphorus and their relative ratios affect the succession among cyanobacterial genera, the exact mechanisms of how cyanobacteria respond to N and P limitations are unknown.

A wealth of literature also suggests that cyanobacterial blooms could occur in oligotrophic conditions (Molot et al., 2021; Ewing et al., 2021; Sterner et al., 2020). A substantial amount of literature suggests that there are a fair number of freshwater lakes where successful restoration programs have reduced nutrient concentrations to mesotrophic or oligotrophic conditions, and yet blooms persisted.

Nevertheless, identifying the sources of nutrients and the relative contribution of N and P to eutrophication should be given the top importance. Nutrients could enter surface waters through various sources, including stormwater, agricultural runoff, municipal discharges, and atmospheric deposition. For proper management of surface water, the relative contribution of each of these sources should be evaluated and documented.

Dr. Ramesh Goel is a professor of Environmental Engineering at the University of Utah and, an active member and participant of WEAU. He is well connected with Utah Wastewater Community.

Ruchi Agarwal is a junior at Rowland Hall High School. She is interested in global water issues and their impact on human health. [DRI](#)

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Long Term Treatment Performance of High Efficiency Sidestream Phosphorus Removal/Recovery System

By Mudit Gangal, Ovivo USA, LLC; Tim Hendrickx, Paques BV; Willie Driessen, Paques BV

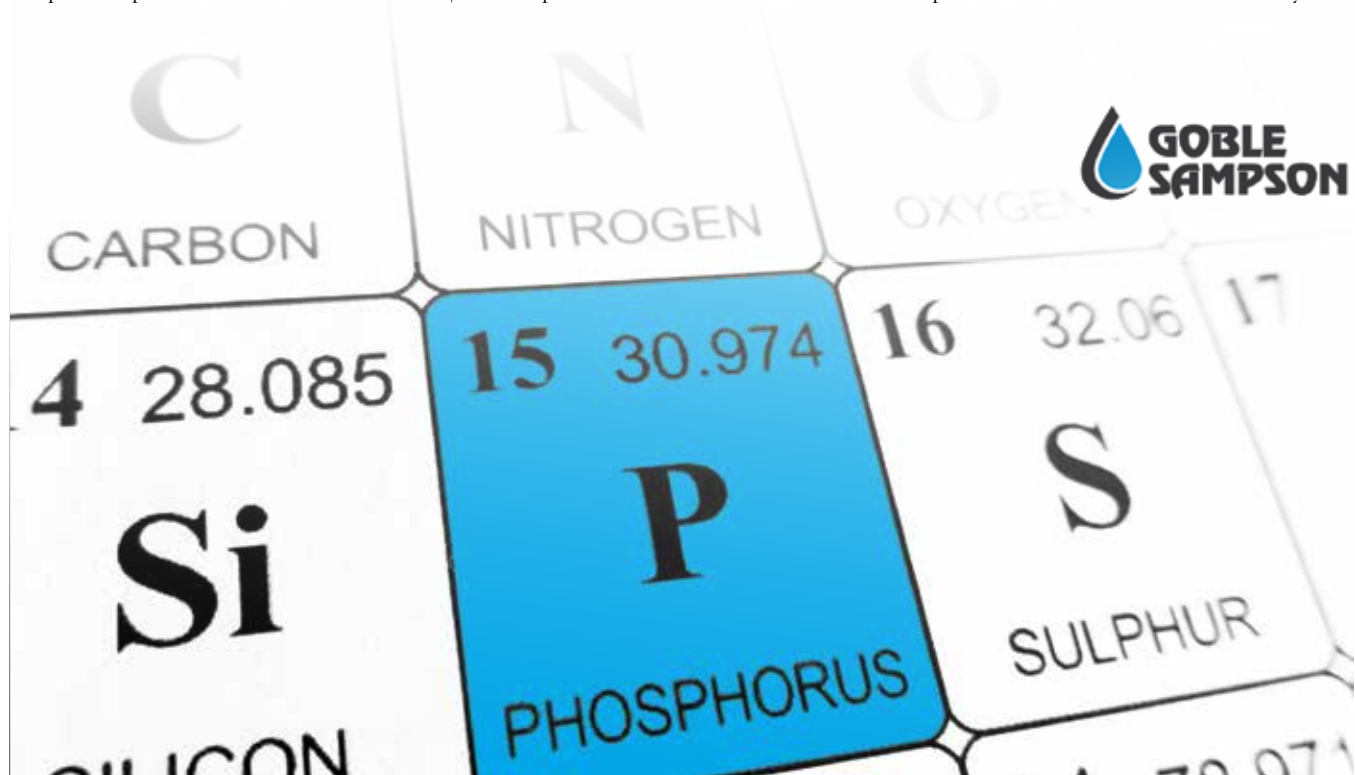
High phosphorus concentration streams such as centrates, filtrates etc. can lead to significant operational and process problems at WWTPs particularly those with Biological Phosphorus removal and/or Thermal Hydrolysis. Therefore, it becomes critical to remove this phosphorus to protect onsite piping and equipment and reduce maintenance costs as otherwise the phosphorus released in the digesters would keep recirculating as a loop between the mainstream and sidestream (as sidestreams are typically taken back to the head of the plant) causing it to build up in the system, leading to nuisance struvite formation and deposition. While it is possible to remove the phosphorus chemically in the mainstream, the demand for the chemicals there can be significant, adding to the utility's operational budget, especially in case of tight effluent phosphorus limits. Further addition of chemicals such as ferric to remove phosphorus can remove alkalinity from the streams leading to the need for additional chemicals (alkalinity), adding to the plant's opex.

An efficient way to remove this phosphorus load can be accomplished much more efficiently and cost effectively in a sidestream treatment system. The Phospaq™ process offered by Ovivo-Paques is an aerated sidestream system that offers the capability to remove or recover Phosphorus in the sidestream via controlled struvite precipitation and has been implemented in over 14 different municipal and industrial facilities globally.

This paper discusses the long term performance of full scale implementation of the Phospaq™ process at three different full scale wastewater treatment plants. The first plant is the Olburgen WWTP in the Netherlands where the process is implemented ahead of a granular sludge deammonification process for a blended municipal and industrial sidestream. Data from over 10 years of operation of this facility is presented where over 80% phosphorus removal was consistently achieved with effluent PO₄-P values below 20 mg/l. Experience with optimizing the Magnesium dosage is also discussed along with impacts of the same on the downstream

deammonification system. The second plant is the Lomm WWTP in the Netherlands where the Phospaq™ system was implemented after an anaerobic granular sludge process, where over two years of operation data are presented including effluent PO₄-P values < 15 mg/l which were consistently achieved with struvite production of over 1,500 lbs/d, in the form of crystals of diameter approximately 0.7 mm, that met EU fertilizer requirements for land application as a commercial fertilizer substitute. The third plant is the De Dommel WWTP, where the Phospaq™ system, apart from helping with the Phosphorus removal, provided BOD and Sulfides removal thereby also aiding as a pre-treatment system ahead of deammonification, for a post THP-AD influent.

The Phospaq™ process thus offers a comprehensive and cost effective solution for utilities looking to address Phosphorus/Struvite issues at their plant with its ability to address multiple client concerns while also providing the option of recovering the Phosphorus as Struvite based slow release fertilizer product which could serve as a potential revenue source for the utility. [bn](#)





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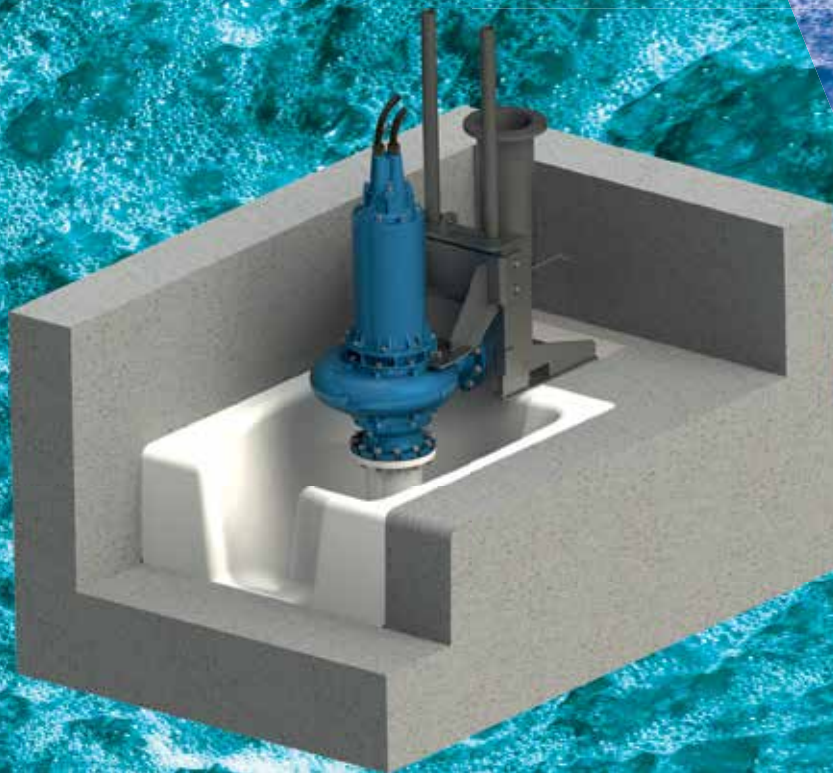


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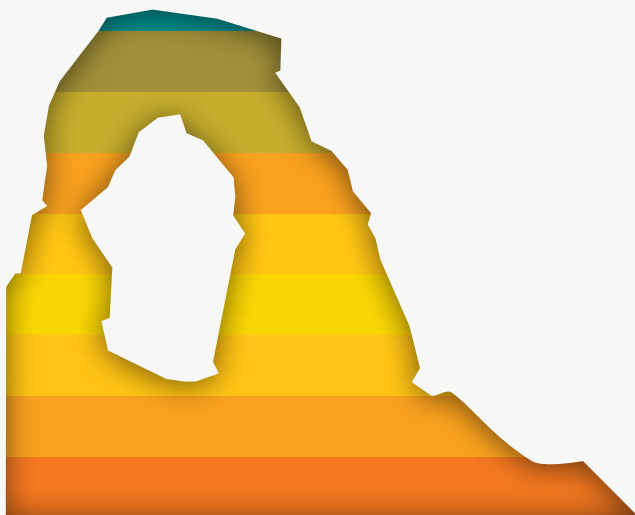
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The *Digested News* Buyers' Guide consists of two sections: a listing of Products & Services Categories and an alphabetical Listing of companies/organizations and contact information.

1. Search under CATEGORICAL LISTINGS for the products/services you require.
2. Note the companies listed under your products/services.
3. Refer to the COMPANY LISTINGS for those companies' contact information.

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2021 WEAU Engineering Symposium

By Randy Zollinger

The 2021 WEAU Engineering Symposium was hosted by South Valley Sewer District on September 30, 2021. Approximately 30 attendees enjoyed several presentations describing current water reclamation facility upgrade projects by the following Utah utilities:

Utility	Presenter(s)
Logan City	Craig Ashcroft, Carollo Engineers
Salt Lake City	Michelle Berry, SLCDPU and Will Peterson, AECOM
Provo City	Cory Christiansen, Waterworks Engineers
Central Valley Water Reclamation Facility	Brandon Heidelberg, CVWRF and Trevor Lindley, Brown and Caldwell

It was great to hold this event again after missing last year and be able to discuss local on-going water reclamation facility upgrade projects between utilities. After the symposium, Central Valley Water Reclamation Facility took a small group on a tour of their water reclamation facility currently under construction. We thank all who attended and helped organize this event and are especially grateful to those who presented and hosted the symposium and tours that followed. [DN](#)



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New Treatment Plant Allows Sought-After Southside to Keep Growing

Growth, progress, prosperity. There's no shortage of it in North Alabama, which has seen its population grow by 30,000 over the last five years and is projected to rise by a further 24,500 by 2027. Jobs are also on the up, having increased by almost 50,000 in the past five years – with a projected growth of 33,000 more jobs, also in the next five years.

In Etowah County, Alabama's smallest yet most densely populated county, vibrant Southside (population 8,000 – about an hour north-west of Birmingham), is its fastest growing city – but this prestigious position held by the place described as the 'loveliest village on the River Coosa,' has been faced with the recent possibility of being overtaken by other fast-rising locations in the state.

With growth, naturally, comes the need for new infrastructure. Southside's old sewage lagoon system, despite decades of excellent management, had finally reached its capacity. All that growth, progress, and prosperity – but a potential halt on building more homes and attracting more business to the area – without a new wastewater treatment system.

"Everything was perfectly in order with our treatment levels," said David Fry, Assistant Superintendent for Southside Water Works and Sewer Board, "but we'd reached the point where there was a moratorium on the lagoon, so to keep Southside on track, the City knew it had to invest – in a treatment system that would future-proof the wellbeing and continued success of Southside."

CDG, Inc. (who operate across the whole of Alabama) were brought in to work with the City of Southside to find the best solution. Bordered by the Coosa River in the foothills of the southern Appalachian Mountains, the area is blessed with wildlife, as well as top-quality boating and fishing, so not surprisingly, it is very well monitored by Alabama's Department of Environmental Management.

Scott Trott, P.E., Chief Strategy Officer at CDG, commented: "As always, we wanted to do much more than just collaborate; we wanted to build a unified team with trust, so we brainstormed long and hard with Brandon Sewell (Superintendent) and David Fry (Assistant Superintendent) at the Water Works and Sewer Board to explore all the options."

He added: "This included seeing how or if the lagoons could be improved, but they just can't economically and reliably meet today's environmental needs. Some poorly maintained lagoons have well-documented issues of unwanted odors, bacterial spread, and nitrogen/phosphorous overload, but the Southside Board and its predecessors had always managed the lagoon system very professionally and successfully."

Ultimately, an SBR (Sequencing Batch Reactor) was chosen; one that was very robust – simple to operate – and could be easily scaled up for future needs. A site was identified, and after the equipment opportunities went out to bid, an SBR from Lakeside Equipment Corporation was chosen from its long-established agent in Alabama, The Eshelman Company.

Scott Trott continued: "Bringing the team together, including Aaron Schmidt at Schmidt Environmental Construction, Inc., we started mapping out the project with a detailed analysis so that we all knew where we were, understood what our success would look like – and how every move we made was in that right direction."

Designed as a cost-effective biological treatment process, Lakeside's SBR benefits from a fully automated system that treats raw wastewater flow in a single basin using timed-based phases to fill, mix, aerate, settle, decant, and waste sludge. It incorporates diffused aeration with mixers to provide optimum mixing and aeration for high oxygen transfer. An innovative decanter minimizes decanting intervals while extending the biological process time. The resultant clear water discharges without foam or floating scum.

'Long-lasting and effective'

Ed Moore from The Eshelman Company said: "For me, the choice of CDG, Inc. and such a long-lasting and effective Lakeside SBR underlines the City of Southside's desire to do things properly. The old lagoon system was hampering the growth and prosperity of the city, so it was exciting to see Scott Trott's forward-thinking design for what was clearly going to be a very well thought out, scalable new plant that would keep Southside one step ahead of the rest for many years to come."



The new site was laid out so that capacity – peak flow of one million gallons per day – could easily be doubled by building new tanks. Initially, it would only be running at around 150,000 to 175,000 gallons per day on average – or up 300,000 gallons per day, depending on the time of year. The site required a fair degree of earth moving for it to be raised – with ample groundwater to contend with – but according to contractor, Aaron Schmidt, this proved a straightforward challenge as the team quickly gelled together.

“Most of the equipment was sourced by The Eshelman Company,” said Aaron, “so being able to call upon Ed Moore’s knowledge and experience was a big help. Lakeside were also always quick to respond to any questions during the 10 months of construction.”

It would be interesting to know just how seamless or otherwise it was when Southside’s first water system was constructed when the City was incorporated in 1957 and constructed its first water system. Now, more than six decades on for its first dedicated wastewater treatment plant, CDG, Inc., through Scott Trott’s design, took great care not to overbuild the new facility, putting a constant review process into place with certified personnel to see the layout from the customer’s viewpoint; carefully considering heights, spaces, and repeat activities – all to make the treatment plant operator’s job easier – without unnecessary obstacles.

Total support throughout

CDG’s Scott Trott continued: “With designs that aren’t overly complicated for the sake of it, Lakeside clearly understands the needs of operators, so this, together with being excellent communicators, made everything much easier and enjoyable to work on. Some companies only work well when the sun is shining, so to speak, but as always, you soon find out who you are really working with when you hit a few stumbling blocks – and I can safely say that Jim Aitkenhead and his colleagues at Lakeside were with us from start to finish – total support throughout, taking huge pride in the job. There have been no problems with the SBR. It is very reliable and effective.”

Based on a 35-year cost analysis, with key component assets forecast for a minimum of 25 years, the Lakeside SBR comprises five key stages in its process.

MIX-FILL: Raw wastewater is introduced into the basin where it is mixed with the Mixed Liquor Suspended Solids (MLSS).

This phase is anoxic and can be adjusted to anaerobic for phosphorus release.

REACT-FILL: Aeration is added as the basin is fed with raw wastewater to create aerobic conditions for BOD and ammonia removal. This phase can alternate between aerobic and anoxic conditions for nutrient removal.

REACT: Raw wastewater flow is stopped from entering the basin. Aeration and mixing are controlled to provide final treatment.

SETTLE: Aeration and mixing are stopped to allow separation of liquid and solids.

DECANT AND SLUDGE WASTING: Clear effluent is removed from the surface by the decanter. Near the end of decanting cycle, a set amount of settled sludge is wasted from the system.

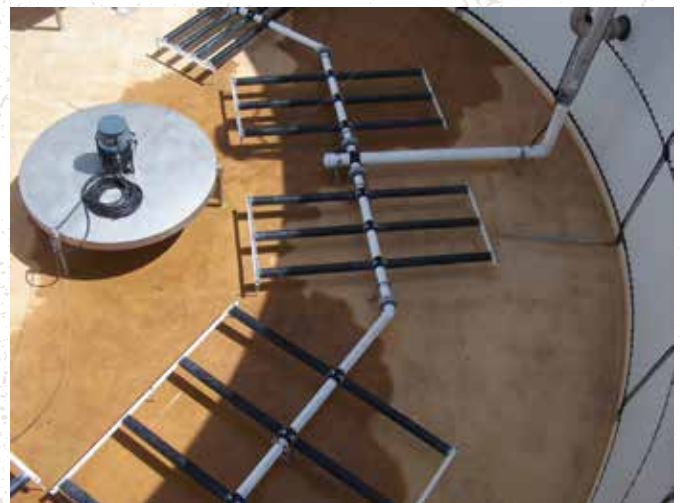
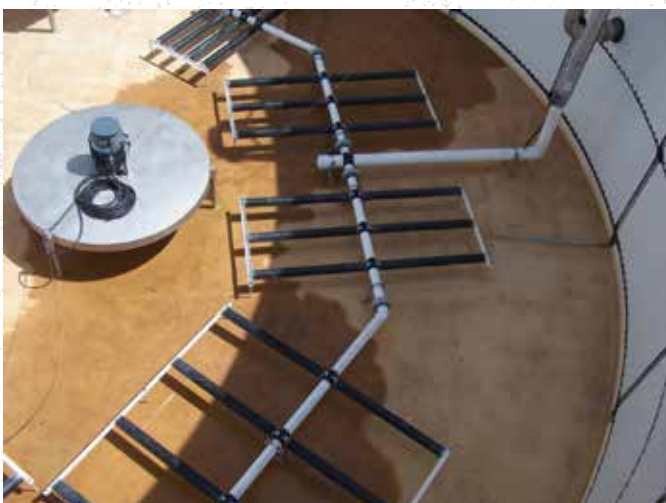
Brandon Sewell, Superintendent for Southside Water Works and Sewer Board, continued: “From managing chlorine levels at the lagoon, there is obviously far more to a full treatment plant, but that said, the SBR is very easy to operate, with the back-up of the SCADA system and the team always ready with help if required. The Lakeside SBR was the right solution for us. It works really well.”

Ed Moore from The Eshelman Company, added: “Southside now has a delightful plant to walk around. It has a really good vibe and feel. Considering it has such a high level of design and such rugged equipment, the final cost of \$4.3M is an outstanding achievement by all concerned, especially because the new facility is so easily scalable for the future. This is a great example of a long-lasting investment for the wastewater industry.”

Crucial to the continuing success and growth of the City

David Fry, Assistant Superintendent for Southside Water Works and Sewer Board, concluded: “The final effluent from the SBR looks just like drinking water, which is pretty remarkable when you see where it has come from. Overall, the plant is very maintenance-friendly.

“Maybe it sounds strange to some people, but the new plant is a great environment to work in – and Southside is a great place to live. This new treatment plant is crucial to the continuing success and growth of the City. Now that there is all this new capacity, Southside can welcome the building of more new homes and investment from new business.” [DT](#)



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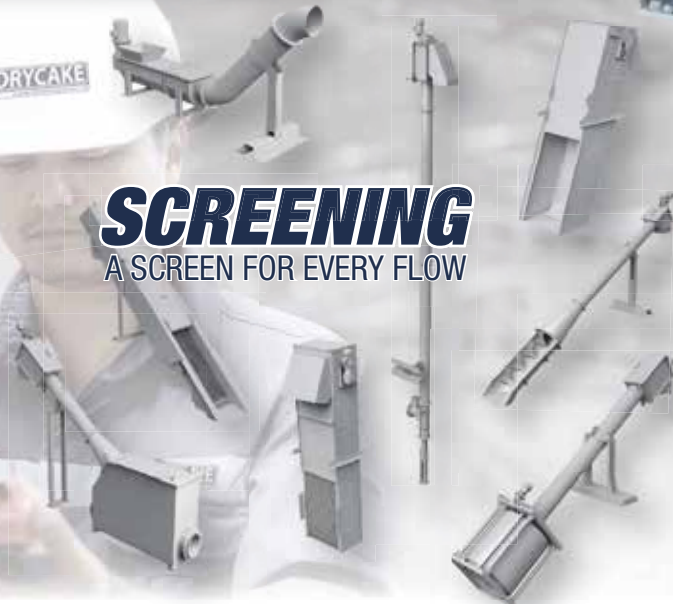


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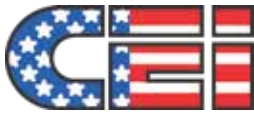


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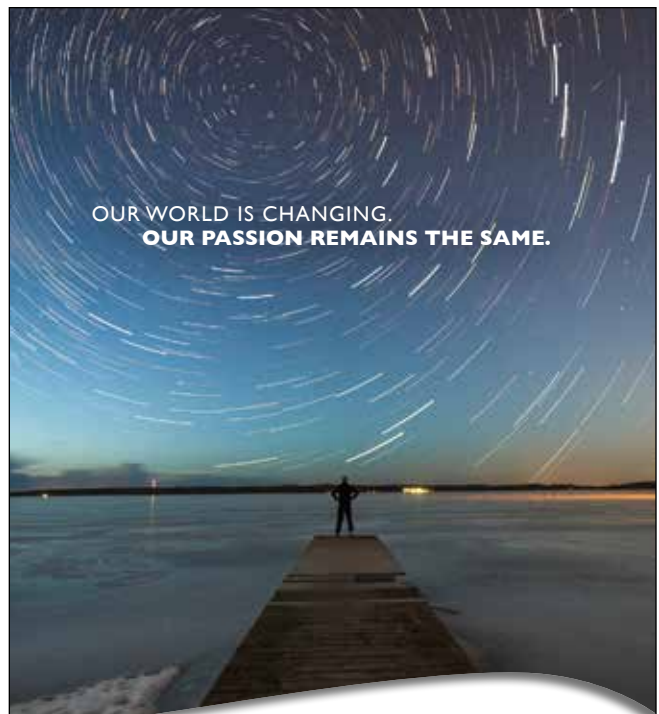


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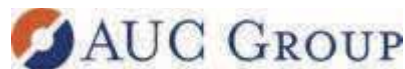
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