SUMMER
2017

The Official Publication of the Water Environment Association of Utah

DIGESTED news

Celebrating 50 Years of Clean Water

2017 WEAU ANNUAL CONFERENCE PREVIEW Recap

Snyderville Basin Water Reclamation District
2800 Homestead Road
Park City, Utah 84098
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INSIDE:

Member Updates ■ Emerging contaminants and pathogens ■ Pretreatment

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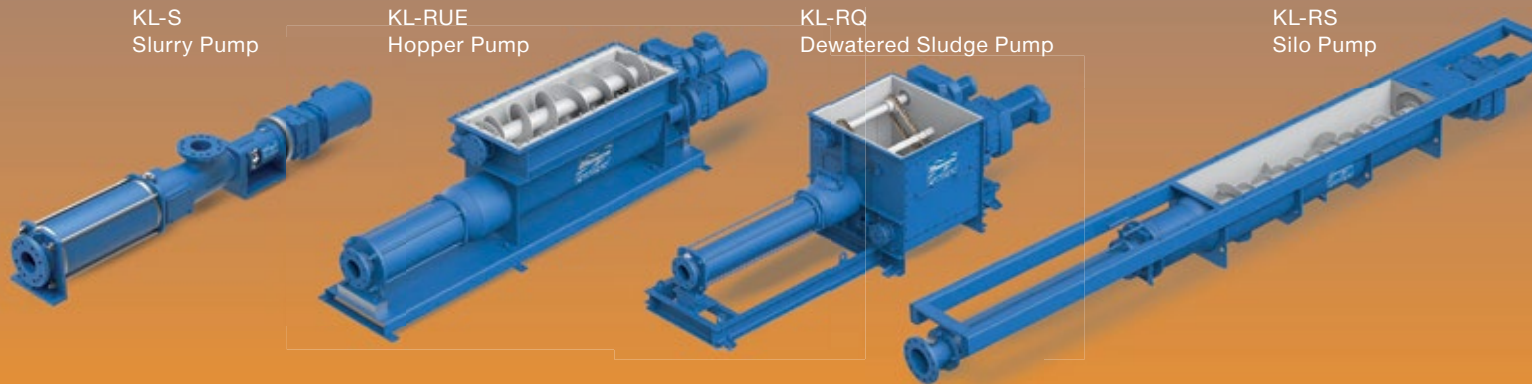

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FEATURES

Departments

Continuing to make WEAU great

Clint Rogers

If a zombie apocalypse happened tomorrow, rest assured that you are in good hands with the current WEAU Board of Directors. How do I know this? As part of a recent kick-off meeting and team building event at Alcatraz Escape Games, the Board had one hour to fend off zombies and escape a series of puzzles and locked doors. We made it through with 15 seconds to spare and no casualties. This was thanks in large part to Lonn Rasmussen's sharpshooting with a zombie stun gun. Is zombie hunting part of the collections training program at Cottonwood Improvement District? I appreciate all the great volunteers that make WEAU go, especially the Board members. We spent half a day planning and team building to get a jump on the 2017-18 year and better serve you.

Congratulations and thanks to Matt Myers, our recent past president, and the Annual Conference Planning Committee for another successful and well attended conference in St. George last month. Great sessions, a packed exhibit hall, the competitive Operations Challenge event, and perfect southern Utah weather made for a fantastic week. It was great to see you all there and thanks again to the many volunteers who take on assignments and to all of our employers who allow us to take our show on the road.

WEAU Board members and Zombie after successfully completing our team-building event. Notice that Lonn still has the Zombie stun gun at the ready.

The Operations Challenge event, in my opinion, is one of the best things we do and a big part of what makes WEAU great. It is a tremendous undertaking in terms of hours, cost of equipment, and

commitment of teams and employers! What are the benefits? Here's my list, but you probably have your own:

1. **Teamwork** within each team, but also within our whole organization. Have you seen these men and women set up and take down the equipment, give high fives in the halls, and celebrate at their BBQ? These friendships and relationships are bigger than just one day of competition.
2. **Recognition** for the heroes. The competition is one of the few times where the folks that make it happen day in and day out get to step into the spotlight. Families cheer, managers crow, WEF staffers fly-in, and those trophies… this is big time!
3. **Pride** in the industry. Long after the Challenge equipment is hauled back to Central Valley, and Fiesta Fun has repaired the go-karts, the individual participants carry with them pride that they are part of the WEAU family, as they go about their duties at their home treatment or collections systems. Perhaps the Magna Flow team is a great example of this. I have seen their participation in the Operations Challenge event over the last few years and noticed it has put a bounce in their step, increased the pride and respect they have for their profession, and made them hungry for success. Watch out other teams, they were third overall this year! Suddenly the community takes notice too, "Magna Water Waste Water Treatment Team cleans up in St. George" was the recent headline in the *Magna Times* community paper.

As a Board, we have made the commitment to invest in the success of our Operations Challenge event. This year more than ever, as we are accepting the invitation to send three teams to WEFTEC due to the great showing our two teams had last year. We wish these teams the best of luck as they prepare to represent us and their employers on the national stage.

I will finish where I began, not zombies, but planning and strategy on how we continue to make WEAU a great organization? How do we give appreciation to those who have been stalwarts in the industry and this organization that are retiring? How do we recruit others and promote the critical work we do? Challenging questions for sure. One solution might be to consider the question WEF has been asking us as members and member associations since it was rolled out at WEFTEC last year, "What is my Water Legacy?"

This question is the focus of a social media campaign to encourage members and all water professionals to share how they are building their water legacy by posting their stories, accomplishments, activities, and contributions to social media using *#MyWaterLegacy*. It is also a call to action for each of us to be appreciative of those who have gone before and to make our own mark. MyWaterLegacy will be a part of our focus this year… more details to come.

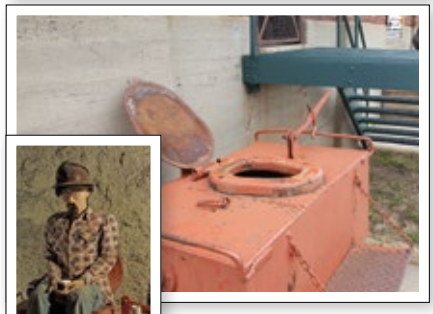
I look forward to hearing your ideas. DN

Improving human health

Chad Burrell

I enjoy learning about history. This year, the R8PA Pretreatment Conference was held in Deadwood, South Dakota. It was a great conference and I took the opportunity to see some of the sites in the area with my family. Homestake Mine, located in the town of Lead, was the lifeblood of this community for many years. We toured some of the sites related to this mine and learned a lot. Through my own doing, my children often have sewer on their minds due to having grown up in a home with a wastewater worker. So, they questioned how a miner would use the bathroom when working 4000 feet below ground. Surprisingly enough, the tour guide was able to answer this question by showing my kids the 'Toilet Cart.' Oh, the stories this cart could tell!!

As humorous as this story was for my family, I could not help but be reminded that, even 100 years ago, there were people doing something underground to improve human health. On our tour, we also drove by the mine's modern day wastewater plant that is used to treat all water that leaves the mine; technology, regulation, and science improvements through the years promoted the transition from dumping mine water waste directly into the nearby river to treating this water prior to discharge. DN



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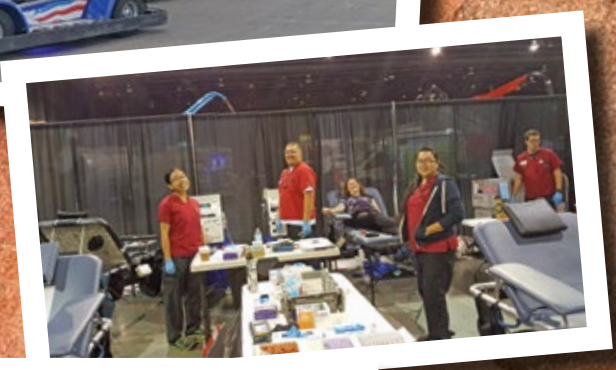
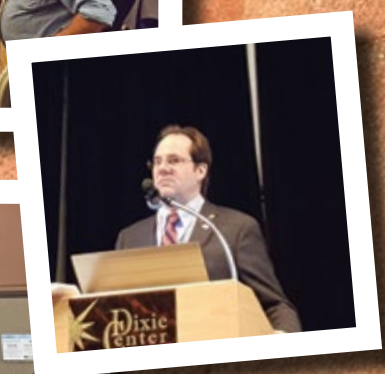
Looking Forward VEGA

2017 WEAU ANNUAL CONFERENCE PREVIEW *Recap*





2017 Annual Conference Committee

- Trevor Lindley
- David Hatch
- Ramesh Goel
- Jeff Weist
- Chris Reilley
- Jared O'Brien
- Rob Jaterka
- Clint Rogers
- Marianka Sochanska
- Bryan Mansell
- Giles Demke
- Greg Stevens
- Dan Griffin
- Jeff Beckman
- Phil Heck
- James Dixon
- Chad Burrell
- Tavis Timothy
- Ken Burgener
- Mike Kobe
- Brent Packer

2017 Conference Awards

Individual Awards

Collections Operator
Dustin Lewis (Snyderville Basin)

Collections Operator
Raymond Mondragon (Magna)

Laboratory Technician
Aimee Matthies (South Valley Water)

Maintenance Specialist
Shane McCowen (North Davis)

Operator (Over 5 MGD)
Weston Gardner (South Valley Water)

Pretreatment Specialist
Chad Burrell (Snyderville Basin)

Supervisor
Rodger Wiker (South Valley Water)

Young Professional
Marianka Sochanska, (Brown and Caldwell)

Not pictured

Operator (Under 5 MGD)
Tony Peterson (Magna)

Hatfield Award WEF
Dale Christensen

Facility/Program Awards

Collections System & Safety Program
Cottonwood Improvement District

Laboratory
Provo City

WRF (Over 5 MGD)
Central Valley

WRF (Under 5 MGD)
East Canyon Water Reclamation

Pretreatment Program
Orem

Lagoon
Francis

Biosolids Program
Central Valley

2015 WEAU Excellence Award
Orem City & Jordan Basin Water Reclamation

2016 WEAU Excellence Award
Snyderville Basin Water Reclamation
South Valley Water Reclamation

Quarter Century Award WEF
Gary Hill

Quarter Century Award WEF
Blaine Boyer

Quarter Century Award WEF
Brent Justensen

Bedell Award WEF
Jon Adams

Laboratory Analyst Excellence Award
Debbie DeJong

SSSSS Select Society of Sanitary Sludge Shovelers, Tavis Timothy, Jared O'Brien

Recap

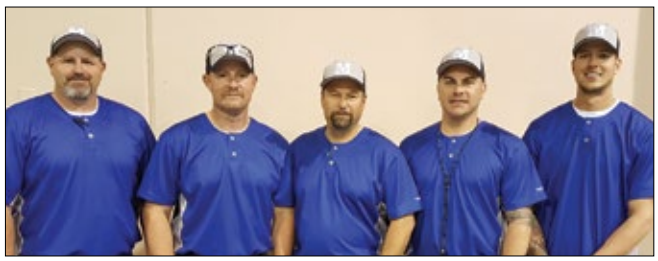
2017 Op Challenge

Ops Challenge Judges

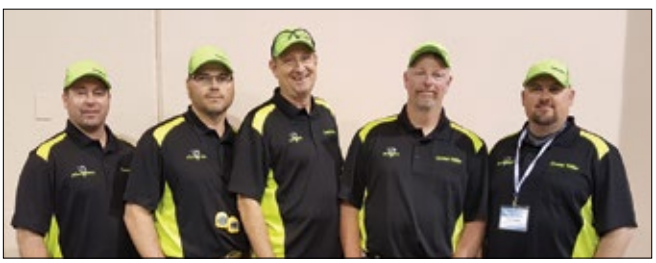
Laboratory: Missy Willes, Loren Willes, Tiffany Adams, Aimie Matthies; **Maintenance:** Jeremy Deppe, Darrin Morris, Kevin Gallagher, Brent Justensen, Dave Barnes, John Gallagher; **Safety:** Tom Cramer, Eddie Alex, Gary Folkner, Shane McCowen, Dakody Gines, Steve Johnson; **Collections:** Tim Madsen, Cody Snyder, Gary Hill; **Process Control:** Sharon Burton, Josh Hunsaker, Jen Robinson, Darrin Morris, Marlo Davis, Chad Burrell; **Ops Challenge Chair:** Marlo Davis; **Ops Challenge Co Chair:** Josh Hunsaker; **PWO:** Jared Obrien; **PWO Elect:** Rob Jaterka

Ops Challenge Teams

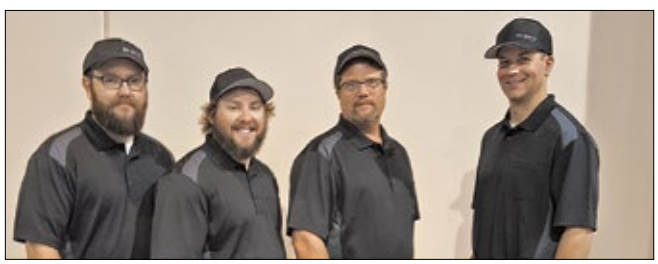
Central Valley: Mike Earl (Captain), Shay Green, Aaron Brittion, Mitch Desmarais, Bryon Peterson (Coach), Austin Petersen (Coach)



Magna Water: Ed Tucker (Captain), Clint Giles, Rob Jaterka, Scott Beck, Beau Lamper (Coach)



Cental Weber: Kevin Draper (Captain), Lee Doxey, Brett Olson, Adam Melaney, Clay Marriott (Coach)



Snyderville Basin: Jordan Probst (Captain), Dustin Walton, Dustin Lewis, Tavis Potter

Cottonwood: Tony Hale (Captain), Mark Leonard, Daniel Watts, Jimmy Cade, John Lewis (Coach)

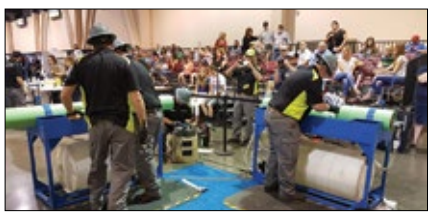
Nice work, teams!












Results

LABORATORY	
1st	Wasted Gas (Central Valley)
2nd	Vortex (Central Weber)
3rd	Magna Flow (Magna Water)
MAINTENANCE	
1st	Vortex (Central Weber)
2nd	Wasted Gas (Central Valley)
3rd	C.I.D. (Cottonwood)
SAFETY	
1st	Wasted Gas (Central Valley)
2nd	C.I.D. (Cottonwood)
3rd	Vortex (Central Weber)
COLLECTIONS	
1st	Magna Flow (Magna Water)
2nd	Wasted Gas (Central Valley)
3rd	Vortex (Central Weber)
PROCESS CONTROL	
1st	Wasted Gas (Central Valley)
2nd	Vortex (Central Weber)
3rd	Magna Flow (Magna Water)
OVERALL	
1st	Wasted Gas (Central Valley)
2nd	Vortex (Central Weber)
3rd	Magna Flow (Magna Water)

Young Professionals Annual Conference Recap

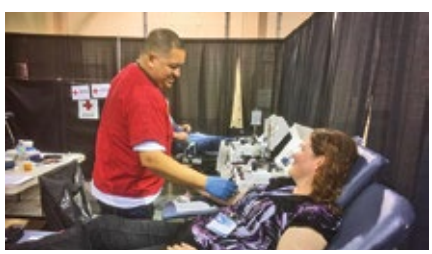
This year's annual conference provided some good opportunities for young professionals to mingle with industry vendors, state regulators, facility operators, managers, and engineers. On Wednesday night, Fiesta Fun Center tickets were sponsored by the YP committee with over 20 people attending. Go-carts and laser tag were the highlight of the night! The following morning, the YP's met at 6:30 am (well, a few of us showed up late!) for breakfast at Black Bear Diner. In attendance was WEAU President Matt Meyers and WEF representative Diane Crilley. In all, over a dozen people attended.

Later that day, the annual blood drive was held, with over 30 people donating! Thanks to everyone that participated!

Finally, on Friday morning the University of Utah student design team presented their project for Magna Water District. Among those attending were Walt Baker from Utah DEQ and Tom Kunetz, Vice President of WEF. Following the presentation, Tom and others gathered outside the room to give feedback and encouragement to the students as they prepare for WEFTEC.

A big thank you to those who organized the events and to those who participated.

Young professionals take a break from the conference Wednesday night at the Fiesta Fun Center.



The annual blood drive was a big success with over 30 people donating!

Good luck in Chicago

By Rob Jaterka, PWO Rep Elect

Central Weber, Central Valley, Cottonwood, Snyderville, and Magna came together and competed in the 2017 Operations Challenge. With a first-place finish in lab, safety, and process control, Central Valley won first place overall. Central Weber claimed first in maintenance and second overall. Magna placed first in collections and third overall. This year, we saw a complete change in the safety event, also a moderate change in collections. With these changes, it made it very exciting for competitors and spectators.

This year, WEF sent Steve Johnson, the head judge for safety, to watch and help judge our event. Steve gave Utah great reviews on how we operate our local competition. Also this year, WEF has given Utah the chance to not only send the first-place team to Chicago, but two all-star teams. So, Central Valley and the two all-stars will travel to Chicago in October to represent our state. The two other teams will be made up from the other four entities who competed.

Also, we cannot forget to give a huge thank you to all the judges who volunteered to come to St. George and put up with us opinionated competitors. Without these men and women volunteering their time, this competition would not exist. Also, a big thank you to the management teams and operators for

allowing us to do this every year. If you have never competed in the Sewer Olympics, I would strongly advise you to give it a whirl. It has been a great experience. The camaraderie of the judges and competitors is the true highlight of it all.

One final note: GOOD LUCK to all those who are competing in Chicago. DN

Summer 2017 Quiz

1. **A portion of a sample is called what?**
   a. meniscus
   b. ntu
   c. protozoa
   d. aliquot

2. **A pipe that carries wastewater under pressure from the discharge side of a pump to a point of gravity flow down stream is called what?**
   a. free board
   b. launder
   c. force main
   d. enteric

3. **The measured alkalinity is 2410 mg/l. if the volatile acids concentration of the sludge in an anaerobic digester is 144 mg/l, what is the va/alkalinity ratio?**
   a. 0.09
   b. 0.06
   c. 0.17
   d. 0.03

4. **The elevation at manhole #34 is 342.6ft. The elevation at manhole #35 is 335.6ft. These manholes are 370ft apart. What is the slope?**
   a. 1.89%
   b. 1.20%
   c. 2.11%
   d. 2.76%

5. **100 feet of pressure is how many psi?**
   a. 2.31 psi
   b. .433 psi
   c. 23.1 psi
   d. 43.3 psi

6. **750cuft of wastewater is how many gallons?**
   a. 7,480
   b. 8,340
   c. 5,610
   d. 6,510

ANSWERS:

1) D 2) C 3) B 4) A 5) D 6) C

Beat the Heat

1. **How does the body respond to heat?**
2. **What is the effect on the rest of the body?**
3. **High air temperature and high humidity affect the body's ability to cool itself how?**
4. **List one of the two chemicals you sweat out that the body needs to function?**
5. **What are the symptoms of dehydration?**
6. **What are the signs of heat rash?**
7. **What are the signs of heat stroke?**
8. **List ways to prevent heat illnesses?**
9. **What personal factors influence how your body will react to heat?**
10. **What jobs at your work are a concern for heat issues?**

ANSWERS:

1. Mover blood closer to the skins surface and by sweating.
2. It does not get supply as much blood to the organs and brain.
3. It does not allow sweat to evaporate as well to cool the body.
4. Salt and or minerals.
5. Thirsty, dizzy, fatigue, weakness.
6. Red, itchy skin, with white dots.
7. High body temperature > 103°F, weakness, fatigue, hot dry skin, not sweating, fainting, difficulty breathing, dizziness.
8. Drink lots of fluids, water or sports drinks.
9. Weight, fitness, activity level, past history of heat problems.
10. Personal list.

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Why, why, why?

By Curt Simmons, WEAU Safety Committee

The wastewater industry is fraught with potential dangers including confined spaces, toxic gases, high-voltage electricity, arc flash, traffic control, biohazards, chlorine, chemicals, etc. It takes many hours of specialized safety training to become proficient in the safe performance of the tasks and responsibilities in which employees engage daily. Some of the risk that these tasks pose can be eliminated by things like: wearing PPE, tie-off for fall protection, or altering a task so the employee does not have to place himself/herself into harm's way.

But most tasks are not risk free. Accepting a reasonable amount of risk is what humans do. If this were not true, you would not have driven to work today in a car because driving is not without risk. As you operate your car, you are very aware of a set of rules which you were trained to know and obey, such as speed limits, stop signs, yielding to other vehicles, etc. The rules have been put in place to keep an orderly flow to **all** of the traffic, yours as well as the other users of this system. Safety cannot exist on guidelines and policies alone; it is based on how well we individually follow these rules and procedures.

I recently read the book ***Start with Why*** by Simon Sinek. In his book, Simon describes the difference between what we do, and why we do it. As I read the book and his many examples of the difference between good and great people, I began to realize he was describing the reason so many safety programs fail. They fail because we do not recognize **why** we do the things we do. For example, **why** we wear safety glasses, **why** we put on a hard hat, **why** we fill out a confined space entry permit, or even **why** we are asked to stop completely at a stop sign in our car. Many of us get it into our heads that the reason **why** we do these things is because we are told to, not because of the safety that these things offer to us. Rules and procedures are written to help remind us **why**. They are not put in place to punish us, but rather to help us choose the correct decision to make based on a possible personal consequence for disregarding them.

> "Safety cannot exist on guidelines and policies alone; it is based on how well we individually follow these rules and procedures.

It would be nice if we all did the right thing because it is the right thing to do. But we are human and many of us believe we are not going to get hurt, or, in many cases, get caught. Humans have a unique outlook on safety; we all must accept some risk as part of life, knowing how much risk to accept is a matter of growing and learning, e.g., a toddler cannot learn about gravity without falling a few times and suffering the effects from that fall in order to learn the concept for itself.

It is the rules then which help define how much risk that we should accept. We follow rules because of the **why** they are written in the first place. Again, they are written and enforced to protect us, they remind us how much risk we should accept. This way, like the toddler, we do not have to fall and suffer the effects… someone else has already done that for us. As the old saying goes, "Learn from other's mistakes, life is too short to make them all yourself."

Often, the term 'shortcut' refers to employees circumventing the rules so they can get the job done quicker or easier. The worst thing that anyone can do is to make a conscious decision to shortcut safety rules. Your employer has spent a great deal of time and money in the process of providing a safe working environment. They have written rules to do just that… to keep you safe! DN

Toolbox Safety Talk: Ladder Safety Tips

Falls from portable ladders (step, straight, combination and extension) are one of the leading causes of occupational fatalities and injuries. Below are a few tips for safe ladder use:

- Read and follow all labels/markings on the ladder.
- Avoid electrical hazards! – Look for overhead power lines before handling a ladder. Avoid using a metal ladder near power lines or exposed energized electrical equipment.
- Always inspect the ladder prior to using it. If the ladder is damaged, it must be removed from service and tagged until repaired or discarded.
- Always maintain a 3-point (two hands and a foot, or two feet and a hand) contact on the ladder when climbing. Keep your body near the middle of the step and always face the ladder while climbing.
- Only use ladders and appropriate accessories (ladder levelers, jacks or hooks) for their designed purposes.
- Ladders must be free of any slippery material on the rungs, steps or feet.
- Do not use a self-supporting ladder (e.g., step ladder) as a single ladder or in a partially closed position.
- Do not use the top step/rung of a ladder as a step/rung unless it was designed for that purpose.
- Use a ladder only on a stable and level surface, unless it has been secured (top or bottom) to prevent displacement.
- Do not place a ladder on boxes, barrels or other unstable bases to obtain additional height.
- An extension or straight ladder used to access an elevated surface must extend at least 3 feet above the point of support (see diagram). Do not stand on the three top rungs of a straight, single or extension ladder.
- The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or other vertical surface.
- Be sure that all locks on an extension ladder are properly engaged.
- Do not exceed the maximum load rating of a ladder. Be aware of the ladder's load rating and of the weight it is supporting, including the weight of any tools or equipment.

> "Safe and efficient use of ladders is not complicated or difficult but it does require that the users practice proper ladder safety habits.

Ladders are common tools that many people assume they know how to climb safely, when in fact they may not. Safe and efficient use of ladders is not complicated or difficult but it does require that the users practice proper ladder safety habits. DN

Region 8 Conference in Deadwood

By Brett Nelson

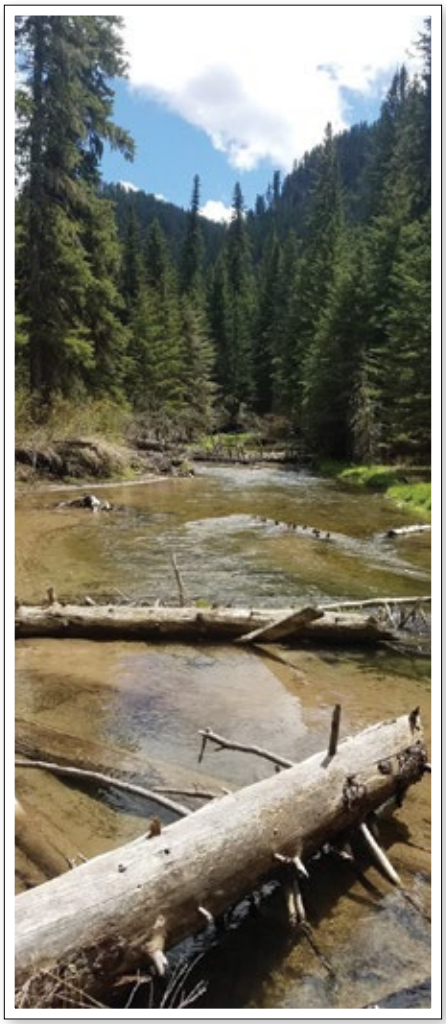
Oh, the grip of Mother Nature as she refuses to let go of Winter. Seems to me she showed but few glimpses of summer until now.

The following is a report on the Region 8 Conference that was held in the beautiful Black Hills of Deadwood, South Dakota this year. First and foremost, my hat is off to the honorable Spencer Parkinson and the dedication that his committee put forth to make this training happen. It was definitely a success in all aspects. There was a great deal of networking as well as opportunities to get to know one another and learn about different aspects of different programs, not only from Utah, but other states within our region.

I believe these trainings offer insight from great resources within our own state. Here are a few examples. Pete S. from St. George offered some great insight on Industrial Waste Surveys and how important it is to be thorough. Adam B. and Jeff M. discussed Pretreatment 101. Thanks to Paul Krauth, Spencer P., Jared Oldroyd, Chad Burrell and Loren Willes for their expertise and willingness to present.

Otherwise, there are not many updates from Region. Dental rule has been put on hold with a regulatory freeze. TOMP plans seem to still be a topic we could benefit from in a fall training session.

The beauty of the Black Hills... the history of the town of Deadwood. It was definitely a great time. DT



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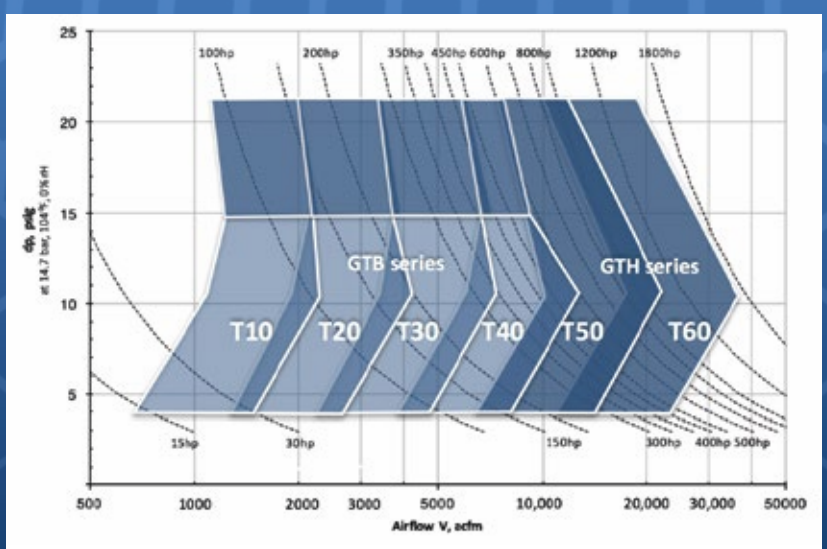
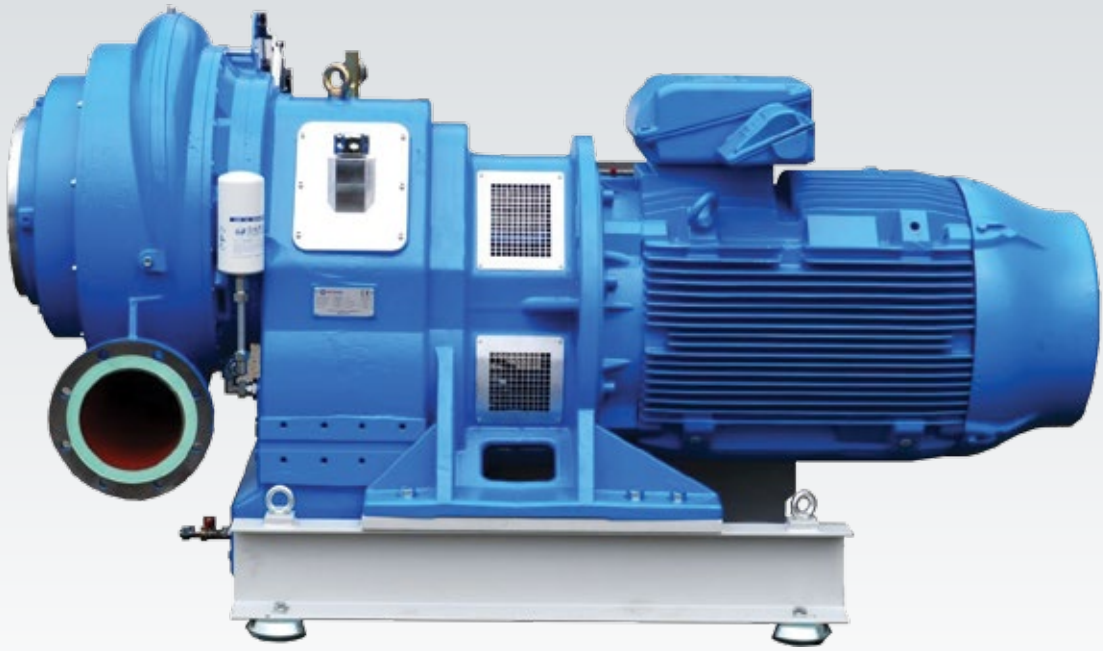




GEARED SINGLE-STAGE TURBOCOMPRESSORS – A MORE RELIABLE, EFFICIENT, VERSATILE SOLUTION!

Scott Matthews, Director, Next Turbo Americas
scott.matthews@next-turbo.com

The novelty and creative marketing of new technologies can often overshadow our conventional wisdom whether they are suitable for the needs of our applications. In today's wastewater centrifugal blower market, reliability, operational range and preventative maintenance have taken a back seat to the unwarranted promotion of VFD's and "oil free" bearings.

The aeration component of a wastewater treatment plant has long been known to account for the dominant portion of the plant's energy bill. Over the past 30 years the conventional three-pronged approach for reducing the kilowatts consumed by aeration blowers has been to use fine bubble diffusers, automate precision air distribution to each valved basin or aerated zone through custom software, and to employ high efficiency blowers. The first two can easily be achieved with established diffuser manufacturers and experienced programmers. However, over the past decade, the third prong has been plagued with lower consumer confidence stemming from false capability claims from emerging nascent technology blower companies.

Aeration blowers are considered to be among the most important of wastewater capital equipment purchases, demanding durability for continuous 20 to 30-year service life. Plant staff often "hire" equipment to fulfill the plant's solution-oriented "job description." A wise end user, or their consulting engineer, defines the job description prior to evaluating various blower technologies. In other words, what blower characteristics meet the minimum requirements of the plant's aeration application?

- How important is efficiency? Are energy rebates available for higher efficiency equipment?
- What test method is to be used to verify blower performance?
- How long do you expect the blower to be in service? Expected equipment life?
- What is the minimum and maximum airflow and pressure requirements for the system? What airflow turndown range is needed for each blower?
- What are the ambient operating ranges?
- How frequently will the blowers needto cycle on and off?
- What footprint is available for the blowers, ancillary equipment and associated piping?
- Are there noise considerations?
- What voltage or electrical service is available?

- Does the plant maintenance staff want the ability to perform preventative maintenance and what is the availability of spare parts? Or does the plant want to out-source the service to the blower manufacturer or third-party company?
- When are the blowers needed? What equipment lead-time is expected?
- What is the budget for the blowers?
- Etc.

For applications requiring blowers with motors greater than 100 HP, proven multi-stage, geared single-stage and gearless single-stage blowers are considered. Evaluated correctly, most owners will find that a proven geared single-stage blower with a 2-point control flow regulation philosophy is a more efficient, reliable and versatile blower for their application than other types offered today.

Geared 2-Point vs. Gearless 1-Point (Speed) Flow Regulation

When head (a function of inlet temperature and pressure ratio) and flow are controlled independently with two devices (2-point control), e.g. variable diffuser vanes and inlet guide vanes, the blower can position itself at the best efficiency point of its respective curve at all operating points and ambient conditions. Conversely, gearless turbos that utilize a high frequency variable speed drive for flow regulation must accept sacrifices in efficiency or flow control range – designing for efficiency sacrifices the blower's turndown flow range, and designing for turndown sacrifices efficiency.

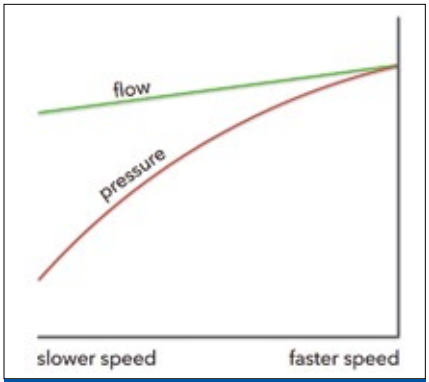
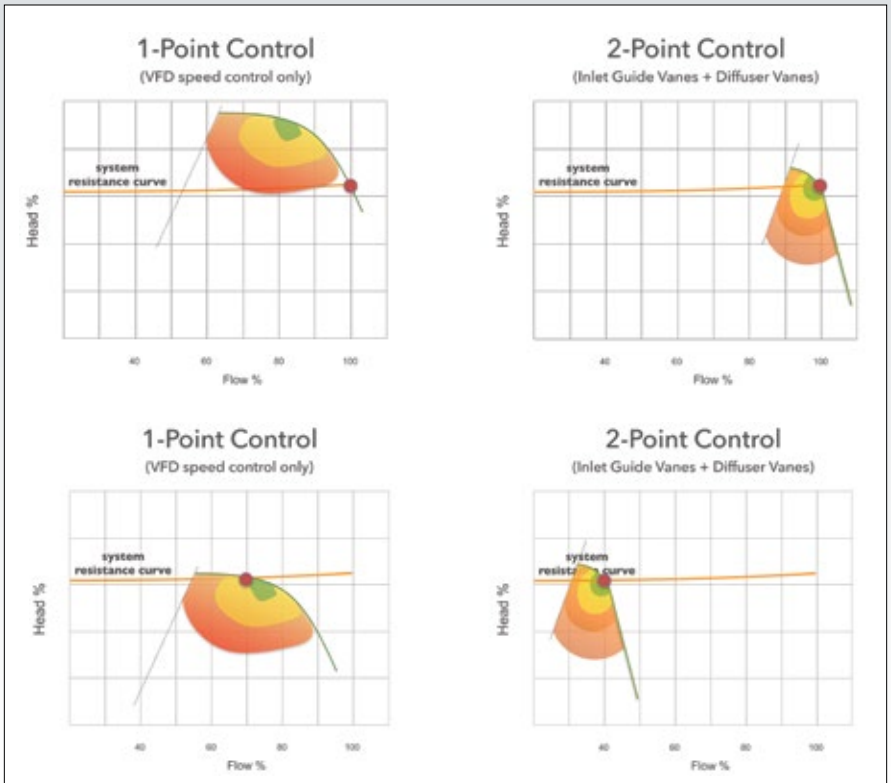


Figure 1. The Affinity Laws tell the story of why so many high speed turbo installations using only speed control suffer from poor regulating range. This is evident when evaluating head and flow charts of various single stage technologies using only speed control for regulating flow.



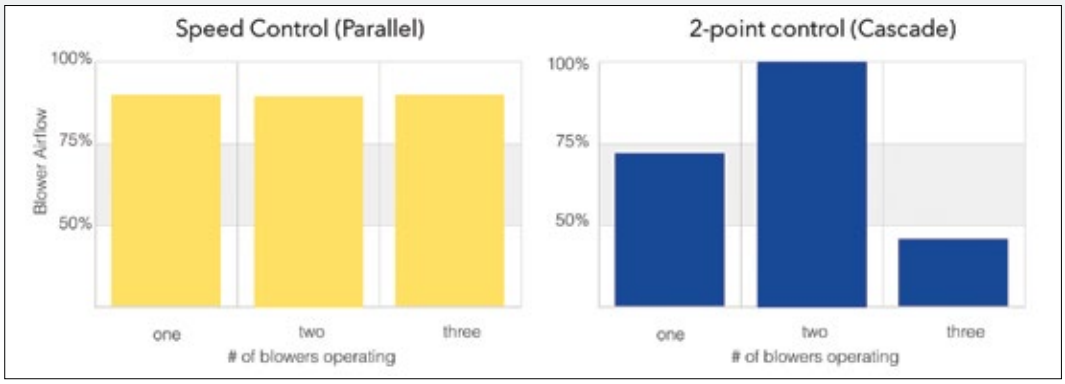
The reduced speed (left chart) decreases the available head (pressure capability) for a gearless turbo using only a VFD for flow regulation. Constant speed geared blowers (right chart), however, use variable diffusers for flow regulation, allowing for the blower (in conjunction with IGVs) to stay in the optimum "sweet spot" of the curve at all operating/ambient conditions, and turndown to 40% of design flow.

The role of a centrifugal single stage impeller is to accelerate the ingested air so that enough velocity energy can be exchanged for pressure energy (head) through an expanding volute and diffuser cone. Sufficient head should be generated to overcome the application's system back pressure. A higher impeller circumference tip speed (higher velocity) will generate more available head. A lower tip speed (less velocity) will result in a diminished head capability, eventually unable to overcome the required system back pressure. For near static water level applications (which accounts for most aeration systems), the use of speed control (by using a VFD) is not an effective flow regulation philosophy for any centrifugal blower (single-stage or multi-stage) due to the sacrifices stated above.

This is because of The Affinity Laws, applicable to all centrifugal blowers used in conjunction with a VFD, which state that if the impeller diameter is held constant and the rotational speed of the impeller shaft is changed, then the flow rate varies directly with the speed and the available pressure varies with the square of the speed. Or simply put, if the speed (rpm) is reduced with a variable frequency drive, then flow reduces linearly, but available pressure output to a much greater degree (Figure 1). Since most wastewater blower applications have a system pressure set by the diffuser depths and piping losses, this issue limits the regulation range.

A constant speed geared technology using 2-point control delivers higher efficiency at all operating conditions and a much wider flow range (100-40%) while retaining the ability to overcome the system pressure.

The green shaded areas are the optimum efficiency areas for each curve. For a speed controlled blower, the efficiency is poor at the design flow. Geared blowers using 2-point control have a steeper, more stable curve and remain in the optimal, efficient portion of the curve.



"Blowers that use only speed control suffer from lack of turndown as previously discussed, thereby causing a discontinuity in the delivery of air. "

Air Flow Continuity

Ideally, plant operators would like airflow continuity from minimum airflow from one blower online to maximum airflow requirements with all blowers online. Blowers that use only speed control suffer from lack of turndown as previously discussed, thereby causing a discontinuity in the delivery of air. This drawback forces the owner to choose between blowing off the excess air or over-aerating the process with too much dissolved oxygen. Either way, the result is wasted energy. ***Limited turndown capability defeats the purpose of purchasing a blower with higher efficiency.***

Geared technologies using 2-point control offer an airflow range from 40% to 100% of design flow. This allows for an overlap of each blower's airflow range. Overlapping airflows create a continuous feed of air at any demand. Additionally, it prevents cycling of blowers (on/off) during temporary plant loading and fends off unnecessary utility demand charges.

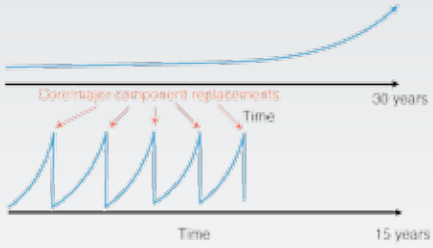
Parallel vs Cascade Control

Two-point control lets operators modulate just one blower at a time (Cascade Mode) rather than modulating multiple blowers at once (Parallel Mode). Speed-controlled blowers must modulate at the same speed (flow) in order to avoid surging each other. Regulating only one blower, as in Cascade Control, permits a more accurate delivery of airflow to the process. The remaining geared blowers would operate at minimum flow, maximum flow, or standby.

Maintenance

Geared technology offers a robust mechanical design that has been used reliably in wastewater plants for decades, however, improved using the latest machining, best engineering practices and aerodynamic modeling. Integrally

geared single stage blowers offer the best available equipment uptime and lowest failure rate. Historically, mechanical blowers almost always exceed their 20-30 life expectancy with a failure curve illustrated below with preventative maintenance inspections interlaced:



Single-stage geared technology employs industry standard components available on the open market. Gearless turbos (air foil or magnetic bearing designs), employ proprietary high speed motors and bearings that are only available from the manufacturer and are not manufactured to any industry standard. In the past decade, gearless turbos (particularly air foil bearing designs) have seen an unacceptable failure rate as illustrated below:

Core replacements (comprising of the aero stage and direct coupled high speed motor), or critical component replacements like high frequency VFDs or magnetic bearing controllers, occur for several reasons for electrical designs, most commonly heat and failure of a non-robust components like air foil bearings. In general, heat is the life-limiting factor for all electrical components. Gearless air foil bearing turbo designs suffer from core failure for a multitude of reasons – heat, lack of sufficient pressure in the air bearing produced by the relative motion of the shaft (rpm), power surges, power switching to/from cogeneration, multiple touchdowns from starts/stops/surging, air particulates, etc. Magnetic bearings designs suffer from heat, demagnetization, bearing controller failure, etc. Geared blowers are not subject to these vulnerabilities.

Frustrated plant owners now recognize a glaring difference between a mechanical geared design and a gearless design is the ability to maintain the equipment over the blower's service life. A mechanical design can be inspected and cleaned every few years to prolong its life and catch a potential component failure. For gearless turbo technologies, there is no ability to predictably or preventatively maintain an electrical design – air foil or magnetic bearing types. The only maintenance available to plant personnel is changing the air filter. When a critical component or core fails, there is nothing plant personnel can do to foresee or prevent its failure. Additionally, the end user must replace or send these core components back to the manufacturer for repair, relying on the manufacturer's service availability and timetable. Geared blower maintenance can be done on site in a much shorter time span.

Summary

Wastewater plants should not sacrifice reliability, efficiency or versatility for unproven, novelty technologies. Harsh wastewater operating environments require durability for long life. Continuous duty operation necessitates high efficiency equipment. And variable plant loading warrants wide operating ranges. Geared single-stage blowers using 2-point control provide these solutions better than any other blower. dn

"For gearless turbo technologies, there is no ability to predictably or preventatively maintain an electrical design – air foil or magnetic bearing types. When a critical component or core fails, there is nothing plant personnel can do to foresee or prevent its failure."

By Steve Dye

Great accomplishments – with more changes in 2017

2016 Legislative Year in Review

The Water Environment Federation (WEF; Alexandria, Va.) Government Affairs Department spent a very busy 2016 advancing the WEF agenda before Congress and building a robust grassroots program for the future. Thank you to all WEF members who contributed to our fruitful efforts in 2016. We look forward to your continued participation in 2017.

Here are highlights of the many critical events and policy changes from the past year.

New President, new direction

The year ended with one of the most monumental (and unexpected) political events in the history of the U.S. with the election of Donald J. Trump as President. While what the future of a Trump presidency will mean for our nation is unclear, there are some early, clear indications of how his agenda may affect the water sector.

Mr. Trump spoke on the campaign trail about a massive infrastructure investment package, reforms to the tax code, and curtailing the reach of federal agencies on matters of regulation and oversight. In early December 2016, WEF wrote a letter to the then-President-Elect detailing WEF's priorities and recommendations for our nation's water policies. The key points in the letter were:

- advancing smart regulations and policies by using sound science and technical merit,
- accelerating and expanding water infrastructure investment,
- bolstering research and development to find solutions to pressing challenges in water,
- developing high-skill construction and water sector jobs, and
- ensuring local water systems are affordable and robust.

WEF also pledged to provide reliable and expert input to the next administration to help solve the nation's water challenges. The full letter is available at *http://bit.ly/wef-letter-to-trump.*

WEF testifies before Congress on infrastructure funding bill

Despite admirable bipartisan efforts by some key members of Congress, for the last decade Congress has struggled to advance major legislation to expand funding resources for water infrastructure investments. While no far-reaching legislation was passed last year, several significant policies advanced deep into the legislative process, only to be cut from final bills. This set the table for 2017, which is expected to see a sizable infrastructure package. WEF contributed to these efforts on several levels.

In April 2016, WEF testified at a Senate Environment and Public Works (EPW) Committee hearing. Rudolph Chow, Baltimore Public Works Director and the new WEF Government Affairs Committee Chair, testified on behalf of WEF (an archived hearing webcast and a transcript of Chow's testimony can be accessed at *http://bit.ly/chow-testifies-to-senate*). The Senate Committee heard the results of an analysis that the committee had requested that WEF and the WateReuse Association (Alexandria, Va.) conduct. The results show the full economic benefits to the economy, job creation, and federal tax revenues from funding the Clean Water and Drinking Water State Revolving Fund (SRF) programs.

The data show that:

- every dollar of SRF spending results in $0.93 of federal tax revenue;
- each million dollars in SRF spending produces 16.5 jobs with an average salary of $60,000/year; and
- every million dollars of SRF spending results in $2.95 million dollars in output for the U.S. economy.

Following the hearing, the Senate EPW Committee introduced its version of the *2016 Water Resources Development Act (WRDA)*, which cited the WEF/WateReuse report and called on Congress to increase SRF funding significantly. The final *WRDA* bill included a version of the Senate provision (further detailed below).

2016 Fly-In a success, setting the stage for 2017

WEF's annual Washington, DC, fly-in event in April 2016 drew nearly 200 water professionals from across the nation to carry the message to Capitol Hill about the need for increased funding and support for water infrastructure. In addition to meeting with Congressional offices, attendees participated in regulatory briefings and roundtables with program directors from the U.S. Environmental Protection Agency (EPA) and other agencies. The fly-in event was part of Water Week organized by WEF and its partners.

Congress finishes 2016 with new funding for water infrastructure

As the 2016 calendar year drew to a close, Congress took several actions benefitting water infrastructure investments. A Continuing Resolution that will fund the federal government through late April includes $20 million to start the *Water Infrastructure Financing and Innovation Act (WIFIA)*. *WIFIA* is a new loan and loan guarantee program that WEF helped create. EPA estimates that the $20 million may provide more than $1 billion in credit assistance and may potentially finance more than $2 billion in new water infrastructure investments.

In addition, Congress passed and then-President Obama signed into law the *Water Infrastructure Improvements for the Nation (WIIN) Act*, which includes the

Water Resources Development Act (WRDA). The bill authorizes port, waterway, flood protection projects, and drinking water and wastewater provisions.

While the *WRDA* authorizes mostly U.S. Corps of Engineer projects and programs, the *WIIN Act* also features WEF-supported provisions, including a Sense of Congress urging robust funding for the Clean Water and Drinking Water State Revolving Fund (SRF) programs. This provision is a result of the Senate version of the *WRDA* bill previously mentioned.

The *WIIN Act* contains provisions to assist the city of Flint, Michigan, including authorization to allocate $170 million through the Drinking Water SRF program and grants to reduce lead in drinking water. The bill also includes a Sense of Congress to provide $20 million to Flint through the WIFIA program.

Sixty million dollars per year also are provided until FY 2021 to help small and disadvantaged communities reduce lead in drinking water at a cost share of 45%. In addition, the bill permits WIFIA loan applicants to finance fees for the loan application process. The bill also changes the WIFIA program to allow applicants to receive credit for any costs and in-kind contributions they incur prior to the loan award.

EPA advances CSO public notification in Great Lakes

In late December, EPA Administrator Gina McCarthy signed a notice of proposed rulemaking (NPRM) implementing Section 425 of the *Consolidated Appropriations Act* of 2016. This section requires EPA to work with the Great Lakes to establish public notification requirements for combined sewer overflow (CSO) discharges.

"This NPRM addresses signage, notification of local public health departments and other potentially affected public entities, notification to the public entities, notification to the public, and annual notice provisions for National Pollutant Discharge Elimination System (NPDES) permittees authorized to discharge from a CSO to the Great Lakes Basin," EPA states on its website.

The rule affects NPDES permits within the Great Lakes watershed that include a CSO. The public comment period is open until March 14 (*www.regulations.gov* at Docket ID No. EPA-HQ-OW-2016-0376).

Water Advocates gain a new home

WEF launched a new online grassroots advocacy website last year to support the Water Advocates program. WEF members and water sector professionals can access the website at *http://cqrcengage.com/wef/home* for important legislative and regulatory matters and calls-to-action on issues affecting the water sector.

A number of grassroots tools on the site help WEF members engage with their elected officials. It's easier than ever to become a WEF Water Advocate and receive notifications about legislative and regulatory issues and calls-to-action — visit *http://cqrcengage.com/wef/wateradvocates*.

A recent successful Water Advocates campaign led to nearly 200 emails and letters sent to Congress during final negotiations over the *WRDA* bill and Continuing Resolution.

With a newly-elected President and the start of the 115th Congress, 2017 is shaping up to be a monumental year for the water sector. WEF will continue to push policies, regulations, and support that reflect the interests of its members. Your input and involvement is greatly appreciated as we work to advance the interests of water professionals before policymakers and the public.

Steve Dye is the legislative director at the Water Environment Federation (Alexandria, Va.). DN

By Brianne Nakamura

Breaking down flushables OR Keeping the matter of flushables moving

Manufacturers release new labelling guidelines; international wastewater groups take a stand

Products all along grocery store aisles carry such warnings as "Toxic! Do not consume!" "Keep out of reach of children," or even "Dangerous for environment."

But flushable wipes – both for household cleaning and for hygiene – carry very few, if any, warnings about the harm that they can cause when flushed down the toilet – which never should be treated as a trashcan.

A new and 'improved' labelling guideline

INDA, the Association of the Nonwoven Fabrics Industry (Cary, N.C.) in February 2017 released the newest edition of their Code of Practice. The new code outlines stricter labeling guidelines for "non-flushable" wipes and hygiene products. The sidebar on p. 33 lists some of the improvements.

The International water industry position statement on non-flushable and "flushable" labelled products was released in September 2016. More than 300 water companies and organizations, representing 25 countries, signed the statement. Photo credit: Water Environment Federation

The code was first released in 2013 as a set of voluntary guidelines to help manufacturers better communicate the appropriate disposal pathways for such nonwoven products as baby wipes and flushable wipes. The code encouraged manufacturers to better label their products, but the "Do Not Flush" symbol and disposal instructions often were hidden behind flaps, on the bottoms of packaging, or presented so small and subtly that they easily could go unnoticed.

Although voluntary, manufacturers are encouraged to comply with the new code within 18-months of the release.

By encouraging a more prominent and uniform positioning of the "Do Not Flush" warning, the code enables consumers to better recognize and identify what NOT to flush.

Water sector input

This new version of the code was developed with the input from wastewater professionals. The process included representatives from Water Environment Federation (WEF; Alexandria, Va.), the National Associations of Clean Water Agencies (NACWA; Washington, D.C.), the American Public Works Association (APWA; Kansas City, Mo.), and the Canadian Water & Wastewater Association (CWWA; Ottawa, Ontario, Canada).

An international problem that can't be wiped away

Recently, wipes also have been getting an influx of international attention with media stories on fatbergs and attention from the "The Weekly" – think of an Australian version of "The Daily Show."

In response to the wipes problem internationally, the International Standards Organization (ISO) launched a Work Group in 2015 to begin establishing an internationally

flushability standard. The group consisted of 15 countries including the U.S., Canada, United Kingdom, Japan, Australia, Israel, and several others. U.S. representatives included members of WEF, NACWA, and APWA.

Initially progress on the ISO standard appeared to be moving faster than the U.S. wastewater collaboration with INDA on the 4th Edition Flushability Guidelines (GD4). However, in September 2016, the International Standard was halted indefinitely due to a complaint from the ISO Toilet Paper Working Group.

In response to the halted progress, the international wastewater groups working through the ISO process issued a joint position statement. Titled, *International water industry position statement on non-flushable and 'flushable' labelled products,* the document can be downloaded at *http://www.wef.org/advocacy/policy-and-position-papers*.

The position statement addresses the following:

- Key requirements for flushability include that a product must break into small pieces quickly, must be buoyant, and must not contain plastic or regenerated cellulose.
- All "flushable" labelled wipes should NOT be flushed until there is a standard that the water and wastewater industry agrees upon.
- All wipes and personal hygiene products should be clearly labeled as "Do Not Flush" and disposed of in a trashcan.
- Manufacturers should provide consumers with clear information on appropriate product disposal.
- And, most importantly, the wastewater industry only supports the flushing of the 3Ps – Pee, Poop, and (toilet) Paper.

Since its release in September, the international position statement has been signed by 25 countries, including 244 wastewater companies/authorities and 69 partner organizations.

States and cities take their stance

Back in the U.S., several states and cities and have started their own initiatives against wipes. Recently, the Council for the District of Columbia (Washington, D.C.) unanimously approved the Nonwoven Disposable Products Act of 2016. This is the first legislation in the U.S. to address the problems cause by flushable and non-flushable wipes. DC Water, which servers the D.C. area and is a leader in the wastewater sector, heavily supported the bill.

Improvements to the second edition **Code of Practice**

Clearer decision tree of what should have a "Do Not Flush" warning

Any product that can be used in a bathroom setting is *encouraged* to be labelled with the DNF warning. Products that can be contaminated by feces, menses, or urine are *required* to have the DNF symbol.

A bigger and clearer "Do Not Flush" warning

The DNF warning must be in high contrast to the product packaging and is sized based on a ratio to the packaging.

More prominent display of the "Do Not Flush" warning

The DNF warning must be prominently and permanently displayed on the product packaging near the point of dispensing as well as visible on the on-shelf packaging. This allows consumers to see the symbol both when purchasing and when using.

The bill prohibits the advertisement, packaging, or labeling of any nonwoven disposable product as flushable, sewer-safe, or septic-safe unless the claim is substantiated by standards set by the District Department of Energy & the Environment (DOEE). Included in the bill is a definition of "flushability"; the definition was taken directly from the aforementioned international water industry position statement.

While D.C. is the first city to make legislation, other jurisdictions also are on the path, notably New York City.

WEF continues to encourage its members to support local initiatives. This can take the form of writing letters of support and educating local representatives on the harm that these products are causing on wastewater systems.

The work doesn't stop with a guideline

As cities and states continue their fight against flushable wipes, WEF intends to do the same. After the success of the Code of Practice, WEF was optimistic about joint initiatives with INDA and wipes manufacturers. However, collaboration on the 4th Edition Flushability Guidelines (GD4), came to a standstill after heavy disagreements between the wipes manufacturers and wastewater sector experts.

As of February 2017, the wastewater associations involved in the GD4 development process (WEF, NACWA, APWA, and CWWA) have withdrawn from continuing the joint development of the flushability guidelines.

Even with the withdrawal from the GD4 process, WEF hopes to continue working on the development of future flushability guidelines to protect wastewater infrastructure. WEF will continue to work with its Flushable Task Force, Member Associations, and other volunteers to communicate the following:

- Only flush the 3Ps.
- Toilets are not trashcans.
- Communities need to know that flushing wipes and other products can harm infrastructure.

Brianne Nakamura, PE, ENVSP is the manager of Collection Systems and Sustainability in the Water Science & Engineering Center at the Water Environment Federation (Alexandria, Va.). She is the staff liaison for both the Collection System Committee and the Flushables Task Force. She can be contacted at *bnakamura@wef.org*. DN

Our concern for the environment

is more than just talk

As we continue to deliver valuable information through the pages of this magazine, in a printed format that is appealing, reader-friendly and not lost in the proliferation of electronic messages that are bombarding our senses, we are also well aware of the need to be respectful of our environment. That is why we are committed to publishing the magazine in the most environmentally-friendly process possible. Here is what we mean:

- We use lighter publication stock that consists of recycled paper. This paper has been certified to meet the environmental and social standards of the Forest Stewardship Council™ (FSC®) and comes from responsibly managed forests, and verified recycled sources making this a RENEWABLE and SUSTAINABLE resource.
- Our computer-to-plate technology reduces the amount of chemistry required to create plates for the printing process. The resulting chemistry is neutralized to the extent that it can be safely discharged to the drain.
- We use vegetable oil-based inks to print the magazine. This means that we are not using resource-depleting petroleum-based ink products and that the subsequent recycling of the paper in this magazine is much more environment friendly.
- During the printing process, we use a solvent recycling system that separates the water from the recovered solvents and leaves only about 5% residue. This results in reduced solvent usage, handling and hazardous hauling.
- We ensure that an efficient recycling program is used for all printing plates and all waste paper.
- Within the pages of each issue, we actively encourage our readers to REUSE and RECYCLE.
- In order to reduce our carbon footprint on the planet, we utilize a carbon offset program in conjunction with any air travel we undertake related to our publishing responsibilities for the magazine.

So enjoy this magazine...and KEEP THINKING GREEN.

By Ken Burgener, Lab Director

Emerging contaminants and pathogens

These compounds are not currently regulated, but are of concern enough that scientists believe there are already affects to human and/or animal bodies, although they may not yet be obvious. While it may take years to come to agreement on the subject, one set of concerning compounds – the endocrine disruptors – should receive some attention.

"**Endocrine disruptors** are chemicals that, at certain doses, can interfere with the endocrine (or hormone) system in mammals. These disruptions can cause cancerous tumors, birth defects, and other developmental disorders. Any system in the body controlled by hormones can be derailed by hormone disruptors."[2]

Here are some of the complications from them. "Specifically, endocrine disruptors may be associated with the development of learning disabilities, severe attention deficit disorder, cognitive and brain development problems; deformations of the body (including limbs); breast cancer, prostate cancer, thyroid and other cancers; sexual development problems such as feminizing of males or masculinizing effects on females, etc."[2] Recently The Endocrine Society released a statement on Endocrine-Disrupting Chemicals (EDCs) specifically listing obesity, diabetes, female reproduction, male reproduction, hormone-sensitive cancers in females, prostate cancer in males, thyroid, and neurodevelopment and neuroendocrine systems as being affected biological aspects of exposure to EDCs.[2] The critical period of development for most organisms is between the transition from a fertilized egg to a fully formed infant. As the cells begin to grow and differentiate, there are critical balances of hormones and protein changes that must occur. Therefore, a dose of disrupting chemicals may do substantial damage to a developing fetus. The same dose may not significantly affect adult mothers."[2]

People receive PHDs for studying such things and that is not what we here trying to do. It is important to note that many of the already stated problems are occurring at all time high rates in the human population and diminishing the quality of life for both humans and animals. Just because society ignores a problem does not make it go away and this is a problem we have ignored for a long time.

According to a recent posting on the WEF website, here is the current plan on how to proceed with compounds of emerging concern. We have a way to go before the procedures are formally decided, but here is the latest:

Emerging Contaminant Research Prioritization Decision Making Frameworks Survey

Background:

The Global Water Research Coalition (GWRC) held a workshop on *Emerging Contaminants and Pathogens* in Karlsruhe, Germany in June 2015. An objective of that workshop was to identify and highlight research needs regarding emerging water quality contaminants. While numerous specific issues were identified, it was broadly acknowledged that the ability for water utilities to do so is hindered by the lack of a clear framework for prioritization. Such a framework would assist utilities in identifying appropriate criteria for prioritization, techniques for 'weighting' of balancing those criteria, techniques for assessing options against the criteria, and techniques for drawing conclusions on research prioritization. The availability of such a framework was considered to have a number of potential advantages. These included:

- An improved basis for research priority decision making;
- Improved decision making justification to stakeholders (including the community);
- Informed policy making.

Objective:

The objective of this project is to develop a transparent and efficient decision making framework to be used in making and communicating decisions around the prioritization of research efforts on emerging water contaminants.

This survey:

This survey has been developed as an initial means of gathering information regarding current practice and further industry needs. Following the survey, a summary report will be prepared as a 'discussion paper' (May 2017). This discussion paper will be circulated among GWRC members for feedback. A final report will present a finalized decision-making framework (October 2017).[1]

End notes

[1] *https://www.werf.org/c/KnowledgeAreas/TraceOrganics/Links/Emerging_Contaminant_Research_Prioritization_Decision_Making_Frameworks_Survey.aspx*

[2] *https://en.wikipedia.org/wiki/Endocrine_disruptor*

ARE YOU STUCK IN THE MUD?

What is Mountainland Supply?
Mountainland Supply is the largest local waterworks house in the state with 12 locations in Utah and one in Wyoming. Our roots in the industry stretch back as early as 1947. Mountainland handles everything for your plumbing, waterworks and heavy civil construction needs.

What do you do at Mountainland?
My name is Quinn Brown. After working as a geologist for six years, I got into technical sales focusing on geotextile, geogrids, storm water, and erosion control products. I have spent the last 13 years promoting, selling, and educating customers throughout the western US. I am currently running the geotextile division for Mountainland Supply.

Can you explain geotextiles and geogrids?
Geotextiles and geogrids have been on the market for the past 20-30 years and serve the primary function on stabilization, separation, and filtration. The primary functions of these products are to extend the life and reduce the overall cost of heavy civil construction projects.

What are Tensar Geogrids?
Tensar has been an industry leader for the past 25-plus years manufacturing, promoting, and brining new technologies to the heavy civil construction industry. Tensar Geogrids are a pre-stressed rigid network of equal size apertures that are used in earthwork construction to bridge soft soils, reduce thick aggregate sections, or allow for construction in extremely difficult conditions. When these grids are put to work in soft soil conditions, they work like a snowshoe by distributing the load over the site and they confine aggregate to create a bridging effect. When you put grid in a section, your aggregate gets locked into place and you are able to build a stable platform for construction.

What do people do if they are not using grids?
When an excavator hits soft soil, traditional construction techniques typically require the contractor to dig out the soft soil, push rock into the soil until the 'bottom' is hit, and bridge the site, or build a thick section to ensure the site could handle the purposed stresses that would be placed on the project. These practices can be extremely expensive and time intensive.

Why do Tensar TRI-AX Geogrids outperform other grids on the market?
Unique to Tensar, the TRI-AX system uses a network of equal sized triangles to confine aggregate. This system outperforms other grids on the market due to several unique physical characteristics.

Traditional grids have flat ribs, where the TRI-AX Geogrids have elevated ribs. This allows for the grid to be much stronger when under stress as well as allow for more surface area for the aggregate to interlock with the system. Think about walking on a 2x4 bridged between two chairs – if one where to walk on the 4" side the board would bow and possibly break in the middle. Conversely, if the board where flipped on the 2" side, you could walk across it without the seeing board bow.

Traditional grids have square apertures where TRI-AX Geogrids have Triangle Apertures. It is known and accepted that, when a wheel load moves over a roadway section, the aggregate moves in a 'fishhook pattern.' This movement puts pressure on the

system requiring strength from the grid in a 360-degree pattern. TRI-AX Geogrids are the only grids on the market that handle stress in all directions, whereas square or rectangular grids only perform in two directions.

To sum it up, TRI-AX Geogrids do a superior job of confining aggregate and extending the overall performance of the system. Everyone from the Army Core and State DOTs to the Federal Highway Association have extensively tested and used Tensar TRI-AX Geogrids.

What are TRI-AX Geogrids most commonly used for?

Grids are most commonly used to mitigate soft soil, pump soil, prevent the relocation of shallow utilities, speed up construction, and reduce the purposed section. Due to the grids unique ability to confine aggregate, you can get the same overall performance of a section by cutting the amount of rock by half and using a layer of grid. Think of grid as 'synthetic aggregate.' We can provide copies of the independent studies proving how this works, and Tensar will go as far as stamping their design.

Can a customer call you if they hit soft soil?

Absolutely. The first thing I will do is ask for a copy of the Geotech report. If you send me the report, I can plug the information into our software and produce a design. If you do not have a report, I can visit the site and perform a Dynamic Cone Penetramator Test (DCP). A DCP test consists of a calibrated weight and scale. Based on the amount of 'blow counts,' we determine the overall strength of soil and calculate how much grid and rock it will take to stabilize the site or by how much we can reduce the section by using our grid system. **This is a service that Mountainland provides at no charge as part of our commitment to be not only your partner in the construction industry, but a resource as well.**

Have you performed these tests recently?

This winter, a contractor putting in a storm water detention system/parking lot called us with serious issues. After excavating the site, they encountered extremely soft soil and standing water. The contractor was extremely worried that the project could not be completed within the agreed upon budget. We determined that, if grid was not used, they would have to excavate again and bring in 26" of rock to bridge the site. We were able to bridge the soft soils by using Tensar's TRI-AX Geogrid and 6" of rock. This not only sped up the schedule, but it allowed the contractor to stay within budget. The amazing thing about these tests is the fact they give the contractor and the owner exact numbers on what it will take to mitigate the soft soil issues they encountered. DN

Spotlight on Mike Earl

I am honored to do my first spotlight on an excellent operator and friend Mike Earl.

Mike started his wastewater career a little over five years ago. He has moved up the ranks from Operator Trainee to a lead DRC Operator. In 2015, he was nominated by his peers and won the title of Operator of the Year for the state of Utah.

Mike has been on the Operators' Challenge team, Wasted Gas, for the last five years. In that time, the team has won multiple state titles and represented the state of Utah in the national events. As the team captain, Mike lead the Central Valley Water Rec. team to a first place all around finish in St. George this past April. He will now lead his team in representing the state of Utah in the national event in Chicago this September.

Currently, Mike holds a Grade 4 Wastewater and a Grade 2 Maintenance Tech certificate. He is one of our lead mechanics at Central Valley Water Rec. Although Mike now works as a mechanic, he continues to make time to help the newer operators coming into the field. Mike is the type of employee who will get the job done no matter what that job may be.

Mike grew up in the Hunter area of Utah, where he excelled at motocross and desert racing. When he is not at work, he enjoys spending time with his wife Heidi and two kids, Brayden and Jovie. He loves to tinker with his toys in the garage and spends a lot of time camping with friends and family. Thanks Mike for all that you do! DN

Retirement: It's time

By Lawrence Burton, City of Orem, Water Reclamation Section Manager

It is amazing to me the reaction you get when someone asks the question, "Where do you work?" Or, "What do you do for a living?" When you tell them you work in the sewer industry, they almost always look at you with a kind of an "I'm sorry" look on their faces. Some of them say, "I'm glad it is you and not me."

To be honest, I am also glad it has been me and not them. When I was a kid growing up on a farm in the middle of Wyoming, I would not have guessed in a million years that I would spend my working career at a Water Reclamation Facility in Utah! I spent the first 10 or so years of adult employment working at different jobs including construction, excavation, oil field work, truck driving, and other odd pastimes. I also spent time in school and received some valuable insights on what I did not want to do!

In the early 1980s, I was employed as a welder in an open pit coalmine in Wyoming. I had hoped to be there for my entire working career. One day they called all of us to the office area, told a select few that times were a little tough for the company, and then handed out termination slips. It was a union job site and the selection was made entirely from seniority. I had been there less than two years. I was married with three small children and no job!

We packed up our belongings and came to Utah, intending to go back to school. We were bunking in my wife's parent's basement and I decided to stop by Utah State Job Service. There was a small card on the wall that said, "Equipment Operator Needed." I filled out the interest card and sat down to wait for an agent to talk to me. I was soon called back to talk to a man behind a desk who looked like he was totally bored. After talking to him for a moment, he told me that he did not think I was a good fit for the position and he was not going to give me a referral. This irritated me a little so I stood up and gave him a small piece of my mind. He leaned back in his chair and with a little sarcasm in his voice he said, "Ok. It's Orem City." Thirty four years later it is time to retire from a career that someone once told me that he thought, "I wasn't a good fit!"

I have had a wonderful time working for the City of Orem. I came to work on the fifth of July, which happened to fall on a Monday that year. It was also the beginning of the pay period. When I received my first pay check, it included holiday pay for Monday, the fourth of July. I thought to myself, "This has got to be a great place to work!" It has been. I have had the pleasure of working with and becoming acquainted with many wonderful people, both here in the City as well as others throughout the state. Most have become my good friends. Some have moved on and others have even passed away. There are also a few with whom I have had a less than good relationship. All have helped me to be a better person. I hope their association with me has had a positive impact on their lives.

I was asked the other day, "What are some of the qualities of a good supervisor or a good leader?" I thought about it for a moment, and then came up with three things that I think help a person be an acceptable supervisor: patience, compassion, and tolerance. Patience helps us not to let small things bother you. Each person you supervise needs time to make their mark and to reach their full potential. Compassion helps us to understand that every person has things going on in their lives that we know nothing about. It is important to understand this. Tolerance allows for people to be themselves. We are not all the same and different people do things in different ways. As long as the end result is the same without a huge amount of variation in getting there, let them do it their way.

Young Lawrence

Experienced Lawrence

> "Thirty four years later it is time to retire from a career that someone once told me that he thought, "I wasn't a good fit!"

I want to express my gratitude for everyone who I have come to know and honor. I will retire on August 1, 2017. My last day with Orem City will be July 28, 2017. I have gained a great respect for honesty and integrity, and for people who will take the time to share knowledge, show genuine concern, become a friend, and to reach out in times of need. The world is full of good people. I know a lot of them. I know that the wastewater industry will move forward in capable hands. I want to express a sincere thanks to all who have had an impact on my life. I have a good friend who always parts with this closing statement: "Have fun. Take plenty of water and keep the rubber side down." My version of this is: "Sit up straight, pay attention and, enjoy the ride." DN

Retirement: Leland Myers rides off

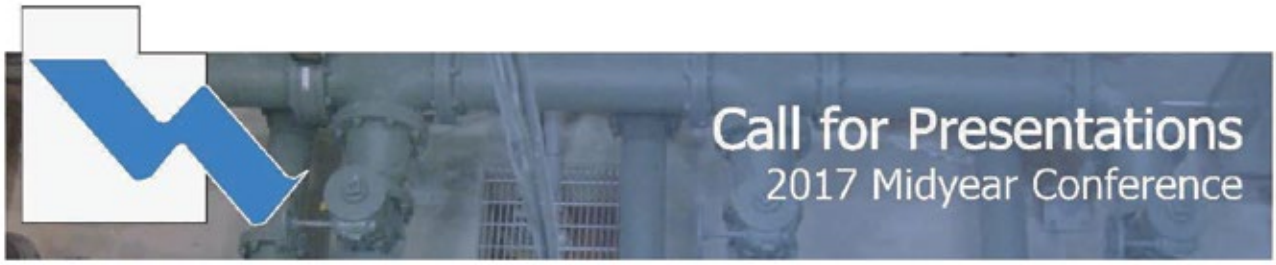
Leland J. Myers retired as General Manager for Central Davis Sewer District in February 2017. He worked at Central Davis for over 30 years, taking on environmental and wastewater issues. He always found a way to provide the best service at the most economical value, while showing how much he cares for the community he serves.

Leland is a recognized expert in the wastewater industry, receiving numerous awards and serving on several boards and committees.

Leland encouraged and provided funding for various Master and Ph. D candidates. After retiring, he continues to volunteer his time to teach students the importance of the wastewater industry.

In addition to volunteering for elementary presentations after retiring, he and his lovely wife are exploring the great outdoors via 4-wheelers. DN

> "He always found a way to provide the best service at the most economical value, while showing how much he cares for the community he serves.



2017 CALL FOR PRESENTATIONS

WEAU MID YEAR CONFERENCE – TUESDAY, NOVEMBER 14, 2017
UTAH CULTURAL CELEBRATION CENTER
1355 WEST 3100 SOUTH
WEST VALLEY CITY, UTAH

The Water Environment Association of Utah (WEAU) **requests abstracts** of technical & non-technical presentations for the Midyear Conference related to the following topics:

• Collection Systems	• Sustainability
• Biosolids	• Reuse
• Disinfection	• Human Resources
• Nutrient Removal	• Energy
• Emerging Treatment Processes	• Odor Control
• Contaminants of Emerging Concern	• Utility Management
• Construction Management	• Alternative Delivery Methods
• Funding/Financing	• Public Outreach
• Operations/Maintenance	• Asset Management
• Operator Ingenuity – In-House Solutions to WWTP Problems	
Other appropriate topics will also be considered	

Abstracts will be accepted only through online submission at www.weau.org. Online entry will require:

- Name and contact information
- Topic and abstract (not to exceed 150 words)
- Brief bio to assist the moderator with introductions (in the case of abstracts that are accepted)

Abstracts will be reviewed and you will be notified if your presentation is accepted. The presentations will be made to attendees at the conference and formal paper submissions are not required.

Submission Deadline: Friday, August 11, 2017

Contact Brandon Wyatt at bwyatt@bowencollins.com with any questions.

WEAU is a member association of the Water Environment Federation (www.wef.org). WEAU is comprised of water quality professionals including utility staff, treatment plant operators, engineers, scientists, and planners working to preserve and enhance water quality. WEAU encourages anybody associated with work in water quality to submit an abstract for the mid-year conference. The mid-year WEAU conference typically has over 200 attendees and provides an opportunity to present important findings in the field of water quality to industry leaders and peers.

Student scientists will compete to represent the U.S. in the

STOCKHOLM JUNIOR WATER PRIZE CONTEST

The Water Environment Federation (WEF) proudly announced that 59 high school students were selected as the 2017 state winners of the U.S. Stockholm Junior Water Prize, the nation's most prestigious youth award for a water-related science project. These student winners from 48 states and Puerto Rico then competed in the national finals June 16-17 at the University of North Carolina at Charlotte. The exhibition and judging took place at the Cone University Center from 8:30 a.m.-12:00 p.m. on Saturday, June 16.

The national winner(s) receive $10,000 and an all-expenses-paid trip to Stockholm, Sweden to represent the United States at the international competition during World Water Week from August 27 to September 1. The international winner(s) will receive $15,000 presented during a royal ceremony by the prize's Patron HRH Crown Princess Victoria of Sweden.

The Stockholm Junior Water Prize aims to increase students' interest in water-related issues and research and to raise awareness about global water challenges. The competition is open to projects aimed at improving of water quality, water resources management, water protection, and drinking water and wastewater treatment.

"WEF is very proud to shine a spotlight on some of our country's brightest high school students, who impress us all with their innovative projects that focus on protecting our precious water resources," said WEF Executive Director Eileen O'Neill. "These students give us great confidence in the future of water science and research."

In the U.S., WEF and its Member Associations organize the regional, state, and national competitions with support from Xylem Inc., who also sponsors the international competition. The Bjorn von Euler Innovation in Water Scholarship Award, a $1,000 scholarship sponsored by Xylem Inc., will be also awarded to the state winner who demonstrates a passion for education, spirit of creativity, and innovation.

For more information on the Stockholm Junior Water Prize and to see the 2017 state winners: *www.wef.org/resources/for-the-public/SJWP/*.

About WEF

The Water Environment Federation (WEF) is a not-for-profit technical and educational organization of 33,000 individual members and 75 affiliated Member Associations representing water quality professionals around the world. Since 1928, WEF and its members have protected public health and the environment. As a global water sector leader, our mission is to connect water professionals; enrich the expertise of water professionals; increase the awareness of the impact and value of water; and provide a platform for water sector innovation. To learn more, visit *www.wef.org*. DN

"WEF is very proud to shine a spotlight on some of our country's brightest high school students, who impress us all with their innovative projects that focus on protecting our precious water resources."

University of Utah team takes water conservation to WEFTEC

WEAU and local universities have shared a partnership with the student design teams for almost 10 years. During that time, the University of Utah, Brigham Young University, and Utah State University have competed in varying degrees for the trip to WEFTEC, with compliments and encouragement of our Utah member association. This year proved to be the highest contested year, with two teams from the University of Utah, and one team from Utah State University. Team leaders included Domnique Bertand (USU Team), Leslie Davis (U of U Team 1), and Heather Christensen (U of U Team 2).

This year's competition started with a problem statement released August 2016 which focused on the 20-year master plan of a portion of the Oquirrh mountain foothills and the water/wastewater impacts to Magna Water District. All three teams met at the Magna Wastewater Treatment Facility for a design kickoff and site tour. For many of the team members, this was their first visit to a wastewater facility. One such team was the University of Utah Team 2. In deciding to compete this year, Heather Christensen recalls, "I wanted to compete again this year and realized that none of my undergraduate peers had even heard of the competition. I recruited a few of my most qualified classmates to make an entire team of undergraduates."

A few months following the tour at Magna, a question and answer session was hosted at the Carollo office to bring the teams together with Clint Dilley from Magna Water District and Trevor Lindley, the USU team's professional advisor.

Finally, after months of preparation, judgment day finally arrived on April 5, 2017. Over 35 people were in attendance, including the judging panel and representatives from Magna Water District. New this year was an open presentation format. Of the experience, Leslie Davis stated, "I enjoyed watching the other teams present. It was nice to see how they approached the problem." The judges were thoroughly impressed by the technical and presentation skills demonstrated by all teams. The judges selected the University of Utah Team 2 and recommended they present at the WEAU annual conference.

Those who attended the presentation during the annual conference were impressed by the design concepts and the overall quality of the presentation. The judges recommended to the Board that the team be sent to WEFTEC to represent WEAU at the national competition. This year's judging panel included Mike Sorensen (Waterford Systems), Lance Wood (Central Weber), Gary Vance (J-U-B Engineers) and Jill Jones (Central Davis).

Special thanks to Terry Pollack, Steve Williams and Clint Dilley for hosting the event and being a resource to the students throughout the process with plant tours, data sharing, and question answering. A special thanks also to professional advisors Phil Heck (Central Valley), Trevor Lindley (Brown and Caldwell), Christopher Cherniak (Cherniak Environmental, Inc.) and faculty advisors Dr. Ramesh Goel, Dr. R. Ryan Dupont and Dr. Jennifer Weidhaas for mentoring the students through the process.

Reflecting on next year's prospects, Heather Christensen says, "It would be really great to see more teams from more universities in Utah present in the competition." Will we be seeing a certain university in Provo make an appearance in the near future? Time will tell.

WEAU congratulates the team and wishes them the best of luck as they compete at WEFTEC. dn

James Dixon introduced the student design team from the University of Utah.

University of Utah team members (L-R) Hanyan Li, Vedansh Gupta, Aditi Podder, Anwar Alsanea, Leslie Davis, with Professional Advisor Phil Heck.

Utah State University team members (L-R) Professional advisor Trevor Lindley, Ahmad Bitar, Dominique Bertrand, Hyrum Tenant, Dan Horne, Brett Hadley, Dane Castellano, and Conor Tyson.

University of Utah team members (L-R) Heather Christensen, Collin Miller, Dani Zebelean, Jennifer Calderon.

Science Fair project

By Andrew Hobson

The YP Committee has worked with local school administrators assisting with middle school and high school outreach. This spring, we helped judge the engineering section of the Ritchey Science Fair. The various engineering projects included a moon lander, robotic arm, and crystal radio. Our personal favorite was the Styrofoam cutter, created by Hunter Thurgood and Cody Sellberg (shown in picture, L-R). The boys' project goal was to reduce the amount of Styrofoam waste in the oceans by designing a hot wire-element cutter that eliminates the 'flurries' from traditional knife-cut Styrofoam. Their's was the only project that leaned towards environmental engineering, and even better, water quality. Keep an eye out for these boys 10 years from now! dn

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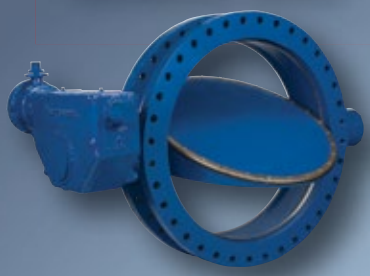

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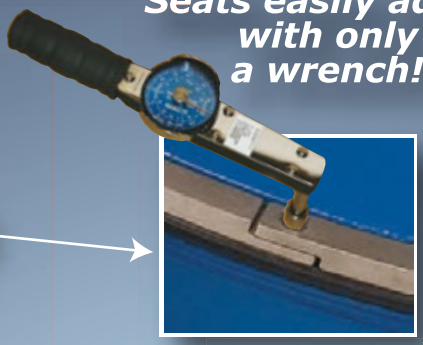

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