SUMMER
2015

The Official Publication of the Water Environment Association of Utah

DIGESTED news

Celebrating 50 Years of Clean Water

WEAU 2015 ANNUAL CONFERENCE Recap

Snyderville Basin Water Reclamation District
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INSIDE:

Turning a Pollutant into a Resource ■ The State of the Flush ■ Surcharging, Why and How

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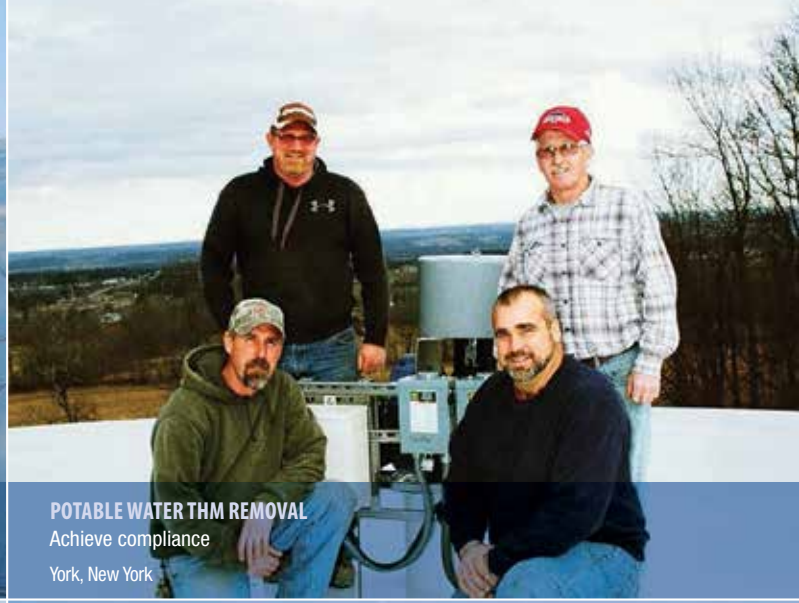

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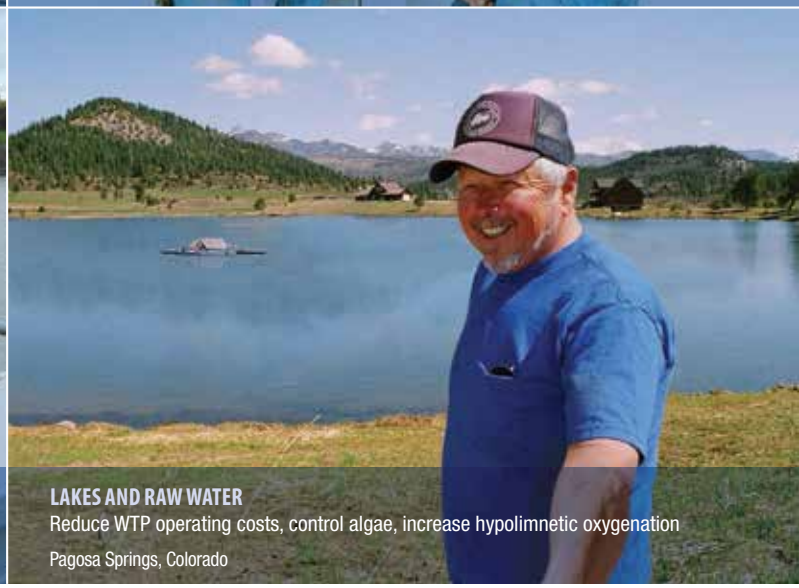

LAKES AND RAW WATER
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2015 Annual Conference Committee

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Involvement in WEAU benefits you and your organization

Phil Heck, Ph.D., P.E.

I am honored to be your President this coming year. The past year was a great one for WEAU, culminating with one of the most successful Annual Conferences in recent memory! I will work hard with our WEAU Board and Committees to keep this momentum going over the next year.

The WEAU Board meets on the last day of the conference and then two weeks later, with one topic of discussion being the conference report. Questions are asked including: How well was the conference attended? How was the food? Did WEAU meet budget expectations? What were the complaints? What can be improved? I can report that (excluding the 2013 joint conference with Nevada) attendance of 465 was a record, people generally liked the food, and we made the money necessary to support WEAU's long list of activities throughout the coming year. This year I heard only one complaint: the poor quality sound system during the lunches, which we will be working to improve next year. This is the lowest complaint level I can remember and is a testament to the excellent planning, execution, and hard work of the Conference Council members. If you have ideas for improving the conference next year please contact me or a WEAU Board member with your suggestions – we value your input!

Our association would not be as successful without the dedicated effort contributed by dozens of volunteers over the past year, the financial assistance of our sponsors, and the support of our employers and entities who allow us the time and resources to serve the association. Special thanks to Mike Foerster, who as 2014-15 President and WEAU Jeopardy! Master spent unknown hours skillfully planning, preparing, and leading the organization through its many successes. Trevor Lindley stepped up as Annual Conference committee chair and with the assistance of Board Liaison Chris Reilley and Annual Conference Council and Committee Members David Hatch, Travis Timothy, John Mackey, Dan Griffin, Jeff Beckman, Tim Madsen and many other volunteers organized a great conference event and expertly covered all the bases.

Recently, I was updating the WEAU Officers Manual which contains lists of past office holders, WEF delegates, PWO representatives, and WEAU/WEF awards recipients. As I reflected on the people in those lists, their WEAU leadership roles, and their successful careers in the Utah wastewater industry, the connection between active involvement and participation in WEAU and career success is apparent. Does the desire to get involved with, and participate in WEAU lead you to career success or does the

> "If you have ideas for improving the conference next year please contact me or a WEAU Board member with your suggestions.

drive to be successful in your career lead you into participating in WEAU? I think it is a bit of both. Whether you're and operator, mechanic, engineer, lab technician, regulator, administrator, manager, board member or other wastewater professional, WEAU provides the assistance with training, knowledge, networking, and camaraderie necessary to increase your career success and satisfaction.

To add vigor to our industry and enhance our member's value to their organizations, I invite everyone, especially Young Professionals, to get involved. Don't be shy, contact me or any WEAU Committee Chair or Board member and let them know you would like to get involved and what your interests are. For active members, Paul Krauth issued this challenge a few years ago in his President's Message: "find someone who is not currently involved in the association, and ASK them to join us at a training, committee, or conference, etc." I would go further and ask that you find a way to help facilitate their initial involvement such as taking them to a meeting or activity and introducing them to others. For many members, especially Young Professionals, there may be impediments to getting involved, such as being low on the pecking order for conference attendance or covering the work load while other employees attend, etc. For those in management positions or serving on boards, I challenge you to find a way to support younger member participation in any way you can. I believe your organization will reap the long-term benefits of doing so.

Over the next year, I would like to identify ways WEAU can help your organization allow more employees to attend and benefit from events such as conferences and trainings without breaking your budget. One idea is to set organization attendance fees based on the size of the entity instead of fees on individual attendees while another idea is to provide discounts based on increasing numbers of attendees from an organization. These discounts would be similar to those provided to exhibitors who purchase more than one booth at the annual conference (i.e., the more units you buy the lower the cost per unit). While attending a WEFMAX Conference, I heard that other WEF Member Associations have successfully implemented some of these measures and I'm sure we can come up with a solution for WEAU that would allow more folks to participate while controlling costs for the entities. If you have a good idea for accomplishing this goal please let me know so it can be presented to the Board for consideration.

Thanks for your attention and I hope you have a safe and enjoyable summer!

Dear WEAU Committee Chairs,
Thank you for serving WEAU.
We are holding a Committee Organization Meeting on Tuesday, June 23, 2015 from 10:00 AM to 12:30 PM at the State DEQ Office Building (195 North 1950 West). Lunch will be provided. Please let me or your Board Liaison (Jennifer Robinson – Conference Council, Jeff Weist – Member Services Council, Chris Reilley – Technical Services Council, Michael McFarland – Public Outreach Council) know if you will be attending.

The objectives of the meeting will be to develop the goals for your committee, plan and schedule committee activities over the next year, ensure you have the information you need to conduct committee business, and develop budgetary needs. Additionally, this meeting affords the opportunity for the WEAU Board to understand your activities and budgetary needs. Budget requests will need to be finalized and submitted in July, so that WEAU Treasurer David Hatch can prepare the budget by Mid-August for consideration by the Board. DN

WEAU offers great training for operators

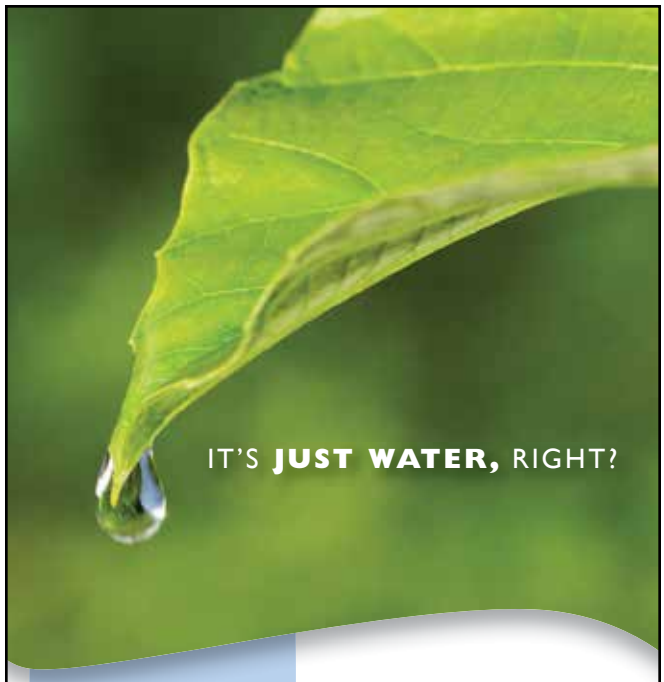
Chad Burrell

It has been 15 years since I passed my Grade 4 Wastewater Treatment Certification test with the State of Utah. I had been working for about eight months for Orem City Water Reclamation Facility and was still fitting in college classes when I could at Utah Valley State College. I was very fortunate at that time to be involved with UVSC's Environmental Technology Department where I learned so many things at the hands of great professors such as Jim Callison, Eddy Cadet, and Dallas Hanks. I know I would not have passed that certification test or better yet be as involved as I am in this industry today if it was not for the instruction and experience I received in the beginning.

Shortly after passing my certification test UVSC asked me to return to help with the certification instruction that they offered through their seminar program. Many of the relationships I have today with individuals in our industry were started there.

Providing training that helps operators pass their certification tests is an important part of the WEAU and all their committees. I hope that all our employers are aware of the training that is offered through WEAU and other organizations. I recently got permission from Rural Water to include in this issue of the *Digested News* their latest announcement on trainings. I hope this will be an ongoing addition to the *Digested News*. Paul Krauth, Lonn Rasmussen, and Sharon Burton have been very instrumental in offering training over the years as well. When these trainings become available we will all do our best to ensure they are published in this magazine as well as posted on the WEAU website. DN

> "Providing training that helps operators pass their certification tests is an important part of the WEAU and all their committees. I hope that all our employers are aware of the training that is offered through WEAU and other organizations.



WATER ENVIRONMENT
ASSOCIATION OF UTAH

WEAU ANNUAL CONFERENCE

Recap





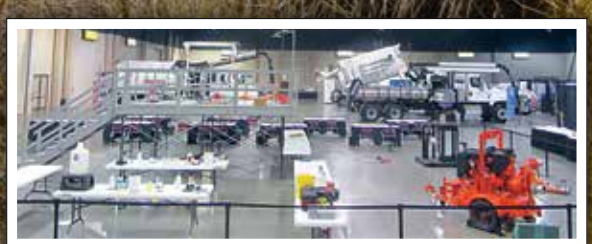











WATER ENVIRONMENT ASSOCIATION OF UTAH

WEAU ANNUAL CONFERENCE 2014 AWARDS












WEF & 5S AWARDS







INDIVIDUAL AWARDS

2014 Outstanding Collections Operator (Over 5 MGD)	**Terrance Harris**
2014 Outstanding Collections Operator (Under 5 MGD)	**Jared Syme**
2014 Outstanding Laboratory Technician	**Tiffini Adams**
2014 Outstanding Maintenance Specialist	**Alonzo Fullmer**
2014 Outstanding Pretreatment Specialist	**DeLaun Fullmer**
2014 Outstanding Supervisor	**Marc Jones**
2014 Outstanding Water Reclamation Operator (Over 5 MGD)	**Rodger Wiker**
2014 Outstanding Young Professional	**Sara Hopp**

FACILITY AWARDS

2014 Outstanding Biosolids Program	**Orem Water Reclamation Facility**
2014 Outstanding Collections System (Over 5 MGD)	**Cottonwood Improvement District**
2014 Outstanding Laboratory	**Central Valley Water Reclamation Facility**
2014 Outstanding Lagoon (Discharging)	**Lake Point Improvement District**
2014 Outstanding Lagoon (Non-Discharging)	**Escalante City**
2014 Outstanding Pretreatment Program	**South Valley Water Reclamation**
2014 Outstanding Safety Program	**Central Valley Water Reclamation Facility**
2014 Outstanding Water Reclamation Facility (Over 5 MGD)	**Orem Water Reclamation Facility**
2014 Outstanding Water Reclamation Facility (Under 5 MGD)	**North Fork Special Service District**

WATER ENVIRONMENT ASSOCIATION OF UTAH

WEAU ANNUAL CONFERENCE

Ops Challenge 2015 ST. GEORGE

Jared O'Brien

It was another great turn out for this year's ops challenge, at the Dixie Center in St. George, UT. This year there were eight total teams competing. Seven of the teams from Utah: Magna Water, South Valley Sewer, Central Valley, Central Weber, Cottonwood Improvement dist., Snyderville Basin, and North Davis. The eighth team was the City of Henderson from Nevada.

If you have never competed in the ops challenge or been a part of it you need to know that the camaraderie between these teams is outstanding. Even though these teams were competing against each other they still found their way around the events cheering each other on. At times some friendly heckling but all in good fun.

This year the point spread for the competition was very close. There was only a seventeen point difference between first and second overall, and only a twenty two point difference between second and third overall. This year the overall third place winner was North Davis. The overall second place winner was Central Weber, and the overall first place winner was Central Valley.

We would like to give thanks to the management of these facilities for the support of their teams. There is lots of time involved when participating in the ops challenge, and that impacts everyone at these facilities in some form. Without the support of the management the ops challenge would not be possible. We would also like to thank all of our judges and event coordinators. The amount of time and effort that you put into these events is much appreciated.

Again the WEAU is planning on sending two teams to the WEFTEC ops challenge representing the state of Utah, in Chicago Illinois. The teams will be comprised of the overall first place team from the St. George ops challenge, and the Wasatch All Star team. The all star team is put together utilizing five persons from five of the competing teams of the St. George ops challenge. We wish these teams the best of luck, and hope to see them bring back some WEFTEC trophies.










WATER ENVIRONMENT ASSOCIATION OF UTAH

WEAU ANNUAL CONFERENCE

Ops Challenge 2015 ST. GEORGE

Team Members

SNYDERVILLE BASIN WATER RECLAMATION DISTRICT
Nick Brown
Dustin Walton
Chad Hardinger
Jordan Probst
Dakody Gines

UNFLUSHABLES (SOUTH VALLEY WATER RECLAMATION)
Dan Humphries
Megan Moak
Bryant Thacker
Steve Lloyd
David Thatcher

COTTONWOOD IMPROVEMENT DISTRICT
Daniel Watts
Scott Brown
Tony Hale
Kevin Smolik
Jonathan Gubler

MAGNA FLOW
Rob Jaterka
Beau Lamper
Ed Tucker
Dallas Henline
Clint Giles

VORTEX (CENTRAL WEBER SEWER DISTRICT)
Clay Marriott
Lee Doxey
Kevin Draper
Shawn Vockler
Shawn Wilson

WASTED GAS (CENTRAL VALLEY WATER RECLAMATION FACILITY)
Hadley Gunn
Michael Earl
Josh Hunsaker
Jared O'Brien
Van Bills
Shawn Grobeng

ROYAL FLUSH (NORTH DAVIS SEWER DISTRICT)
Marc Godfrey
Jason Stansfield
Tom Anderson
Gordon Call

HENDERSON NEVADA DUMPLINGS
Rita Smith
DJ McBride
Zoltan Revay
James Koloskie
Brian CarlSTUD

WATER ENVIRONMENT ASSOCIATION OF UTAH

WEAU ANNUAL CONFERENCE

Ops Challenge 2015 ST. GEORGE

Operations Challenge Results

Team Name	Safety			Laboratory			Maintenance			Collection			Process			Final	
	Time	Score	Rank	Time	Score	Rank	Time	Score	Rank	Time	Score	Rank	Time	Score	Rank	Score	Rank
#1 Magna Water	5.13	82.17	4	7.37	87.83	4	6.57	94.92	3	2.25	85.05	3	-1270.00	75.00	5	424.98	5
#2 South Valley Sewer	7.07	60.00	8	8.13	80.48	6	8.23	61.22	7	3.44	60.00	8	-1360.00	76.91	4	338.62	8
#3 Central Valley	4.17	93.14	2	6.11	100.00	1	6.32	100.00	1	2.30	84.00	4	-2445.00	100.00	1	477.14	1
#4 Central Weber	3.57	100.00	1	8.55	76.43	7	7.01	85.99	4	1.54	100.00	1	-2360.00	98.19	2	460.61	2
#5 Cottonwood	5.04	83.20	3	10.25	60.00	8	7.11	83.96	5	2.36	82.74	6	-845.00	65.96	7	375.85	6
#6 City of Henderson	5.58	77.03	7	6.11	99.98	2	7.23	81.52	6	1.58	99.16	2	-1215.00	73.83	6	431.51	4
#7 Snyderville Basin	5.24	80.91	5	8.12	80.58	5	8.29	60.00	8	2.54	78.95	7	-565.00	60.00	8	360.44	7
#8 North Davis	5.40	79.09	6	6.42	97.01	3	6.53	95.74	2	2.35	82.95	5	-1680.00	83.72	3	438.50	3

Score Sheet Comments

1. Process score entered in as a negative number due to score formatting ascending.
2. First place formated in **orange**.
3. Second place formated in **blue**.
4. Third place formated in **Brown**.
5. What ever cell C36 is set at, limits the minimum score.
6. With the exception of process, all times entered are minutes then seconds in decimal form (6:15 sec = 6.25)

Thanks to all!

Thanks for making this a great career

By Gordon Evans, PWO Representative

Twenty eight years ago I was visiting with a good friend of mine, Merlin Smith, past director of Environmental Science Utah Technical College Provo, about life in general and the path that my current career choice was going. It was during one of these visits that he told me about the water treatment industry primarily Waste Water Treatment. He said, "I can guarantee three things. 1- This job is going to require more skilled workers. 2- The wages paid for this job are going to do nothing but get better. And 3- that it was NOT GOING TO GO AWAY. This intrigued me so I began to look into what it would take to become an operator of a Treatment plant. In the fall of 1987 I enrolled in the Environmental Science program where I met many of the friends I have that are operators today. These friends encouraged me to take the Operators Certification exam even though I had only been in school for a couple of months. This plus my schooling allowed me to be offered a job at what was then known as Snyderville Basin Sewer Improvement District. It didn't take very long before the promises that Merlin made started to come true. The State of Utah soon after adopted a mandatory certification program, which meant that the operators would need more training to become better skilled in their jobs. In the past 27 years of my career as a Treatment plant Operator I have met many wonderful individuals. I have had the opportunity to work side by side with many of them in lots of different capacities. I cannot express the gratitude I have for all of my friends who have been an influence on me these many years. You are truly an exceptional group of people. I am very impressed with the wealth of knowledge possessed by all of you and the skill level that you bring into your jobs. Operators of the Waste Water Treatment plants today are no longer the cousin of the Mayor who is only qualified to plant flowers in the city park and mow the lawn. You are an exceptional group of people who work hard to protect our environment and teach the public that what we do is for the betterment of the world. With this job has come one very special part that I would like to talk about for a moment. 26 years ago I attended my first Operators Challenge event. It was held at Central Valley WRF at that time. I believe there were three or four other teams there and we did three events. We serviced a vertical pump by changing the packing and adjusting the impellor clearance. We installed a leak kit on a ton cylinder and we did a basic laboratory event by pouring a correct meniscus and taking a DO reading. I remember how much fun it was especially since none of the teams had any chances to practice. I think we won the event. Well now we have an Operators Challenge event that is second only to the national event. The teams are all first rate and the interaction between teams is the best part. As I take over the responsibilities this year of the PWO representative I have big shoes to fill. There have been many before me that have truly exemplified the qualities of a professional Waste Water Operator. Some of my duties are to oversee the Challenge event. I look forward to this because it is one of the highlights of my career. Also I have the opportunity to help provide training for all of you. I am interested in what you would like to have as far as training. If you would be willing to email me with any ideas you have I would greatly appreciate it. I am here to help you. I can be reached at *gordone@jordanbasin.com.* Thanks to all of you for making my career so great.

Announcement

It's not too late to start thinking about next year's OPERATORS CHALLENGE. To anyone and everyone interested in being on a challenge team whether it's as a complete team or individuals wanting to participate. Start planning now, we can pare people up to form teams. This year we would like to invite managers to participate with a team of their own. This is a great event and we want you to join us. Questions: Contact Gordon Evans PWO Representative at *gordone@jordanbasin.com.*

Operators Quiz

BIOLOGICAL NUTRIENT REMOVAL

TRUE/FALSE

1. T/F The difference between anoxic and anaerobic zones is that the anoxic zone contains free oxygen while the anaerobic zone does not.

2. T/F For efficient removal, all forms of phosphorous must be biologically converted to phosphate.

3. T/F When operating a nitrogen removal process, the operator must consider wastewater temperature, mixing requirements, and process pH control.

4. T/F Internal return steams, such as centrate, thickener overflows, and digester supernatant, may decrease the ratio of soluble BOD to soluble phosphorous enough so that biological phosphorous removal deteriorates.

MULTIPLE CHOICE

5. Phosphorous may be present in raw wastewater as organic phosphorous, ortho-phosphorous, or _____?
   A. polyphorous
   B. monophosphorous
   C. triphosphorous
   D. phosphoric acid

6. The biological process of _____ can produce alkalinity?
   A. carbonaceous BOD removal
   B. denitrification
   C. nitrification
   D. phosphorous removal

7. The nitrification process is controlled by temperature and _____?
   A. SRT
   B. the F/M ratio
   C. hydraulic loading
   D. phosphorous entering the aeration basins

8. Determine the amount of alkalinity that must be added to the plant effluent, given the following:
   Influent ammonia: 27mg/L
   7.1 mg/L alkalinity/mg ammonia oxidized
   Influent alkalinity: 130 mg/L
   Targeted residual alkalinity: 50 mg/L
   Flow: 30 mgd.
   A. 112 mg/L
   B. 28,000 lb./d
   C. 192 mg/L
   D. 15,500 lb./d

ANSWERS:

1. False. Anoxic conditions have DO less than 0.5 mg/L and an input of nitrate-nitrogen.
2. True.
3. True.
4. True. SBOD/SP ratios of at least 10/15 are required to achieve an effluent TP of 1 mg/L and 20/25 to achieve an effluent TP of 0.5 mg/L. Recycled solids release phosphorous under anaerobic conditions.
5. A. polyphorous
6. B. denitrification
7. A. SRT
8. First calculate the amount of alkalinity required:
   A. (27mg/L X 7.1 alkalinity required) + mg NH_3 oxidized = 191.7 mg/L alkalinity.
   B. 192 mg/L alkalinity + 50 mg/L residual alkalinity = 242 mg/L alkalinity to be added.
   Next calculate the amount of alkalinity to be added:
   A. 242 mg/L alkalinity required – 130 mg/L alkalinity available in influent = 112 mg/L alkalinity to be added.
   Finally determine the lb./d of alkalinity to be added:
   A. 30 mg/L X 8.34 lb/gal X 112mg/l alkalinity = 28,022 lb./d alkalinity to be added.

Annual Pretreatment Conference 2015

The Annual R8PA Pretreatment Conference was held April 14-16, 2015 at St. George at the Best Western Abbey's Inn. It was a convenient location to have the conference this year with beautiful red rocks as not only a landscape but to explore in the evening. Although we know the most important part of the conference is the training/learning, the Pretreatment Conference attendees know how to have an enjoyable experience. We laugh, tell stories, reacquaint with old friends, meet new friends and always have good company.

This year the conference was well attended with almost every City or District in Utah represented. Speakers were from DWQ, EPA, vendors and pretreatment, wastewater and drinking water professionals from the region. Topics at the conference covered stormwater, biosolids, the famous amalgam separators, FOG, grease in digesters, local limits, ERP, noncompliance, permits, metal finisher process, industrial technologies and other related pretreatment topics. Overall, it was a well-rounded agenda.

The weather in St. George was pleasant as we arrived on Monday but Tuesday through Thursday we had the treat of high winds and cool temperatures. Most of us were not expecting the cool temperatures in St. George, but then we were glad it wasn't snowing like back at home.

WEAU sponsored the dinner for the attendees on Tuesday evening from Café Rio. The evening was well attended with good food and company. It was a great way to get to know other pretreatment professionals on a different note then just all work. We would like to thank WEAU for a wondering evening.

Wednesday afternoon there were two networking opportunities; attendees could follow Paul Krauth to the St. George Wastewater Treatment Plant for a tour or follow Jen Robinson to Zions National Park for a hike. We would like to thank St. George management for allowing attendees tour their plant. Or there were those who choose their own networking activities with golfing, hiking Snow Canyon State Park, mountain biking, exploring St. George or lounging at the hotel.

We would like to thank Jen Robinson from DQW for her service as the R8PA chair. She did a great job and represented Utah Pretreatment very well. Spence Parkinson from South Valley will take the Chair position on July 1. We wish him luck and he already knows he can count on the Utah Pretreatment Professional to help him out during his time as chair. We would also like to wish and congratulate Adam Butterfield from South Jordan for being reelected as Treasurer and Brad Jones from Logan for being elected as the member at large representative for Utah. DN







From wef hq Leading-edge updates from the Water Environment Federation

By **Barry Liner, Ph.D., P.E.**, is director of the Water Science & Engineering Center at the Water Environment Federation (WEF) Water Science & Engineering Center. Sam Jeyanayagam, **Ph.D., P.E., BCEE**, is chair of the WEF Nutrient Roadmap publication task force.

Turning a pollutant into a resource

An overview of nutrient removal and recovery at WRRFs

In excess, nutrients can be harmful water pollutants. Nutrients are found in agricultural and home fertilizers as well as agricultural operations. Sources include confined animal feeding operations, industrial pretreatment facilities, septic systems, and water resource recovery facilities (WRRFs) as well as municipal and industrial stormwater runoff.

According to the U.S. Environmental Protection Agency (EPA), more than 100,000 mi^2 of rivers and streams, close to 2.5 million ac of lakes and ponds, and more than 800 mi^2 of bays and estuaries are affected by nitrogen and phosphorus pollution. Excess nutrients can lead to algal blooms, which can produce toxins and result in hypoxic zones. Algal blooms cost the tourism industry some $1 billion annually, according to EPA. These substantial impacts are the reason regulatory nutrient limits are expanding across the country.

Nutrient removal at WRRFs

Nutrient management begins with nutrient removal to meet permit requirements. WRRFs can achieve very low nutrient discharges through a variety of processes, primarily biological nutrient removal (BNR), physical separation, and chemical methods. Most technologies capable of removing both nitrogen and phosphorus utilize BNR, which relies on bacteria to transform nutrients present in wastewater. In BNR, bacteria are exposed to the influent from primary treatment. The selection of a BNR process should be based on influent flow and loadings, such as biochemical oxygen demand (BOD), nutrient concentrations, and other constituents as well as target effluent requirements.

Select species of bacteria can accumulate phosphorus, while others can transform nitrogen, and a few can do both. Achieving significant reductions in both nitrogen and phosphorus requires careful design, analysis, and process control to optimize the environment of nutrient-removing organisms. The uptake of nutrients and growth of microorganisms could be inhibited by a limiting nutrient, available carbon, or other factors, including oxygen levels.

Some nutrient removal systems rely on two separate processes for nitrogen and phosphorus removal. In some cases BNR is used to remove the majority of nitrogen and phosphorus, and then chemical methods are used to further reduce phosphorus concentrations. Mainstream nutrient treatment takes place within the typical plant process flow. However, *sidestream treatment* refers to liquid resulting from biosolids treatment (anaerobic digestion and dewatering) that is intercepted with an additional treatment goal — to remove nutrients from a concentrated stream and minimize mainstream impacts. Like mainstream nutrient treatment processes, sidestream treatment can also vary from biological to physical and chemical removal methods.

Nitrogen removal

Nitrogen can be removed from wastewater through physiochemical methods, such as air-stripping at high pH, but it is more cost-efficient to use BNR. Conventionally, this method utilizes the natural nitrogen cycle, which relies on ammonia-oxidizing bacteria to transform ammonia into nitrites (NO_2^-) after which nitrite-oxidizing bacteria form nitrates (NO_3^-) — a process called *nitrification*. Other species of bacteria can transform these compounds into nitrogen, a harmless gas (N_2) — a process called *denitrification*. Nitrification can occur in the aeration basin together with BOD oxidation as they both require aerobic conditions. In contrast, denitrification takes place in an anoxic reactor with the nitrate providing the required oxygen. As

"The Water Environment Federation (Alexandria, Va.) has released a Nutrient Roadmap to support the movement toward smarter and sustainable nutrient management in the context of each WRRF's specific regulatory climate and stakeholder preference."

denitrification occurs, nitrogen gas is produced and released safely into the atmosphere, where nitrogen gas is more abundant than oxygen. Nitrogen gas is inert and does not pollute the atmosphere.

When performing biological nitrogen removal, it is important that the activated sludge has enough available carbon to sustain denitrification. The bacteria that mediate denitrification need carbon to build new cells as they remove nitrogen. This means that utilities must make decisions on how best to use the carbon for the combinations of nutrient removal/recovery, energy generation, and/or recovery of value-added nonnutrient products.

The nitrogen removal rate is also dependent on the amount of time that sludge spends in the reactor (solids retention time), the reactor temperature, dissolved oxygen, pH, and inhibitory compounds. Optimal conditions differ for nitrification and denitrification, but both can be carried out simultaneously in the same unit if anoxic and aerobic zones exist. Some process configurations, such as oxidation ditches and sequencing batch reactors, combine nitrification and denitrification within a single tank while others incorporate two separate stages. Nitrogen removal processes can also be broken down into two categories based on whether bacteria are suspended within the wastestream or fixed to media. Examples include integrated fixed film activated sludge (IFAS) and denitrification filters.

A method of nitrogen removal that has gained favor over the past decade is deammonification, a two-step process that avoids nitrate formation. Aerobic ammonia oxidation to nitrite occurs in the first phase, then nitrogen gas is produced through anaerobic ammonium oxidation (also known as *Anammox*). Anammox is a biological process carried out by specialized bacteria that oxidize ammonia, and nitrite is used as an electron acceptor (oxygen source) under anaerobic conditions.

Nutrient removal is an essential part of wastewater treatment to help prevent algal blooms, as shown in this 2011 satellite photo of an especially severe case in Lake Erie.
Credit: MERIS/NASA; processed by NOAA/NOS/NCCOS

Phosphorus removal

Unlike nitrogen, phosphorus cannot be removed from wastewater as a gas. Instead, it must be removed in particulate form through chemical, biological, hybrid chemical–biological processes, or nano-processes. Nano methods involve membranes and include reverse-osmosis, nanofiltration, and electrodialysis reversal. Chemical methods (chem-P) typically utilize metal ions, such as alum or ferric chloride. These compounds bind with phosphorus and cause it to precipitate and be removed by sedimentation and filtration. Chemical methods are influenced by a number of factors including the phosphorus species, choice of chemical, chemical-to-phosphorus ratio, the location and number of feed points, mixing, and pH.

Enhanced biological phosphorus removal (EBPR or bio-P) relies on phosphorus-accumulating organisms (PAOs) capable of removing phosphorus in excess of metabolic requirements. While many factors impact the EBPR process, the two most important requirements are availability of a readily biodegradable carbon source (food) and cycling of the PAOs between anaerobic and aerobic conditions. In the anaerobic zone, PAOs take up and store carbon. The energy required for this is obtained by releasing internally stored phosphorus. In the subsequent aerobic zone, the stored carbon is assimilated and the energy is used to uptake excess phosphorus.

Consequently, the design and operation of EBPR systems must consider the availability of a readily biodegradable carbon source (such as volatile fatty acids) and the integrity of the anaerobic zone by eliminating dissolved oxygen and/or nitrate contributions from

the influent, return streams, and backflow from the downstream aerobic zone. As with biological nitrogen removal, oxygen levels, solids retention time, and temperature play an important role in EBPR efficiency. It is common practice to add a standby chemical system to account for poor EBPR performance. Many existing biological nitrogen removal processes can be modified to remove phosphorus by adding an anaerobic phase.

However, economic and environmental trade-offs exist, such as greenhouse gas production in the form of nitrous oxide as well as increased energy demands. Nutrient removal techniques can also affect biogas production and dewatering. The dewatering process is negatively affected by bio-P. During anaerobic digestion, flow from the bio-P process can decrease the efficiency of dewatering and require additional polymer as a coagulant, particularly when there are fewer beneficial metal ions, such as iron and aluminum.

From removal to recovery

Beyond simply removing nutrients, WRRFs also can reclaim nutrients. Recovery not only prevents nutrients from entering waterbodies but provides a supply of these essential resources. The most straightforward way of recovering nutrients is through biosolids. EPA estimates that the approximately 16,000 WRRFs in the United States generate about 7 million tons of biosolids. About 60% of these biosolids are beneficially applied to agricultural land, with only 1% of crops actually fertilized with biosolids. However, generating solid fertilizer from biosolids is the most common method of nutrient recovery from wastewater.

Wastewater operations that have adopted the principles of becoming a utility of the future are using the nutrient removal process to produce marketable products beyond simple biosolids, including nutrients, energy, electricity, and vehicle fuels. Phosphorus used for fertilizer is a finite resource, with some estimating that demand will outpace supply within the next century. In a similar vein, ammonia is produced via the Haber-Bosch process, which consumes natural gas (a nonrenewable resource), is an energy-intensive process, and is associated with greenhouse gas emissions. Interest in recovering nutrients from wastewater has increased over the last decade. However, the maturity of nutrient recovery technologies varies, and each has its advantages and disadvantages.

Sidestream treatment of sludge and sludge liquor, where nutrients are more concentrated, is generally the preferable target for nutrient recovery, but resource recovery complexity can vary widely depending on local conditions. In addition to nutrients, there are other types of products that can be recovered, such as metals, heat, and potable or drinking water, which may bring financial rewards and benefits to help offset utility costs.

These are some nutrient-based and other resources that can be recovered at a WRRF:

- Solid fertilizer from biosolids
  - Land application of biosolids recycles nitrogen, phosphorus, carbon, and other macronutrients.
  - Soil blends and composts are potential phosphorus recovery products.

- Incinerator ash is also a source of phosphorus for recovery.
- Solid fertilizer from the treatment process
  - Struvite precipitation and recovery: By this method, both phosphorus and ammonium can be simultaneously recovered, producing a high-quality fertilizer from some sidestream systems.
  - Other methods of phosphate precipitation such as brushite are also becoming common.
- Water reuse
  - Irrigation with reclaimed water can have some nitrogen and phosphorus benefits.
  - Chemical recovery
- Structural materials can be obtained from carbonates and phosphorus compounds.
  - Proteins and other chemicals, such as ammonia, hydrogen peroxides, and methanol, can be recovered.
  - Solids can be stored for future mining.

A roadmap to nutrient recovery

With the complexity of nutrient removal and recovery alternatives available, utility staff may wonder how to move forward to address current needs or plan for future impacts of nutrient limits. The Water Environment Federation (Alexandria, Va.) has released a *Nutrient Roadmap* to support the movement toward smarter and sustainable nutrient management in the context of each WRRF's specific regulatory climate and stakeholder preference. The *Roadmap* provides a straightforward, high-level framework for planning, implementing, and evaluating different steps of a net-zero nutrient discharge strategy and can be found at *www.wef.org/nutrientroadmap*.

Note: The information provided in this article is designed to be educational. It is not intended to provide any type of professional advice including without limitation legal, accounting, or engineering. Your use of the information provided here is voluntary and should be based on your own evaluation and analysis of its accuracy, appropriateness for your use, and any potential risks of using the information. The Water Environment Federation (WEF), author and the publisher of this article assume no liability of any kind with respect to the accuracy or completeness of the contents and specifically disclaim any implied warranties of merchantability or fitness of use for a particular purpose. Any references included are provided for informational purposes only and do not constitute endorsement of any sources. dn

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From wef hq Leading-edge updates from the Water Environment Federation

By **Brianne Nakamura**, Program Manager in the Water Science & Engineering Center at the Water Environment Federation (Alexandria, Va.).

The State of the Flush!

Better product guidelines, marketing standards for pipe-clogging "flushables" are on the way

Flushable wipes: To flush or not to flush?

While the average consumer might wash their hands of the matter without a thought, for those in the wastewater industry, the nightmares of clogged pumps and sanitary sewer overflows (SSOs) come to mind. Recently, the topic of "flushable" wipes has become front and center within the wastewater industry, as more consumers are turning to a wet wipe rather than the common dispersible toilet paper.

While flushable wipes have been on the market for years, the question of their degradability has been garnering more attention in the media and prompted state-level responses, such as the recently proposed bill in Maine requiring that products labeled "flushable" live up to their claim.

Advertising versus reality

According to the current Association of Nonwoven Fabrics Industry (INDA; Cary, N.C.) guidelines (GD3, June 2013), a "flushable" is "any product that is marketed as 'flushable' [that] can be flushed into the wastewater system without adversely impacting plumbing or wastewater infrastructure and operations." Under voluntary INDA guidelines, a product must pass seven assessment tests or be clearly labeled with the "Do Not Flush" logo.

These tests include a toilet and drain-line clearance test, disintegration "slosh box" test, household pump test, settling column test, aerobic test, anaerobic test, and municipal pump test. According to INDA guidelines, if a product passes all seven tests, it should not "under normal circumstances" block toilets, drainage pipes, water conveyance, and treatment systems or become an aesthetic nuisance in surface waters. But testing and real life can have different outcomes, especially under "normal circumstances." The U.S. Federal Trade Commission (FTC) recently announced its tentative agreement with wipe manufacturer Nice-Pak Products Inc. (Orangeburg, N.Y.), that might further define some of these issues.

Problems can't be wiped away

For wastewater utilities, these "nondispersibles," or anything other than human waste and toilet paper flushed down the toilet, are problematic throughout the treatment process. They cause ragging in pipes and lift stations and get caught in screens, pumps, and settling basins.

Nondispersibles wreak havoc in rainy and dry climates alike. They clog collection systems during storms and cause SSOs or, in a drought-ridden area (we're looking at you, California), the lack of water velocity in collection systems prevents wipes from breaking down. In extreme and highly publicized cases, the accumulation of wipes and other nondispersibles can cause the formation of "fatbergs," such as those weighing as much as 15 tons in London sewers.

Industry response to the flushables flood

Although recent media attention has increased awareness of the consequences of convenient-yet-clog-causing wipes (and other nonflushable materials), wastewater utilities throughout the country have responded with their own public education campaigns, such as "What2Flush" in California and "Don't Flush Baby Wipes" in Maine. These initiatives, as well as the wastewater industry's "Three P's (Pee, Poop, and *"Toilet"* Paper) standard, have been informing homeowners and renters about what's OK

to flush and to not use toilets as trash cans.

The Water Environment Federation (WEF; Alexandria, Va.) has also been involved in the initiative to improve flushability requirements and educate the public. In 2010, the WEF Collection Systems Committee formed a Flushables Task Force in response to the growing concern about wipes-related problems. The WEF House of Delegates (HOD) followed suit in 2012 to involve Member Associations with the formation of the HOD Non-Dispersible Work Group.

The WEF Flushable Task Group, formed in 2014 and currently chaired by Scott Trotter, has worked on several initiatives for better public awareness about nondispersibles, including this 2013 billing stuffer campaign.

To create a singular message, the WEF Flushable Task Group, formed in 2014 and currently chaired by Scott Trotter, has worked on several initiatives including a 2013 billing stuffer campaign with the tagline, "It's a Toilet, Not a Trashcan!" The group also advocated for collaborative studies conducted by the Water Environment Research Foundation (Alexandria, Va.).

More recently, the Task Group, as a representative of WEF, is collaborating with four other associations representing the water sector and the nonwoven fabrics industry: INDA, the National Association of Clean Water Agencies (Washington, D.C.), the American Public Works Association (Kansas City, Mo.), and the Canadian Water & Wastewater Association (Ottawa, Ontario). The goal is to develop a new, fourth edition of guidelines (GD4) that will influence product design and support the marketing of nonwoven products as "flushable." The guidelines are scheduled to be released in July 2016.

In addition, the collaborative effort is behind the Product Stewardship Initiative to increase public and consumer awareness about the proper disposal of wipes. The initiative seeks to improve the labelling of both flushable and nonflushable products, as well as increase the industry's responsibility over the downstream impacts of flushable products.

WEF has been heavily involved in both GD4 and the Product Stewardship Initiative. As the awareness of the problems of flushable wipes continue to increase, both in the media and within the wastewater industry, WEF continues to support the initiatives of the Flushables Task Force. While we can't stop consumers from flushing things down their toilets, we can stem the tide with better education and incentives for corporate responsibility. DN

Brianne Nakamura is a Program Manager in the Water Science & Engineering Center at the Water Environment Federation (Alexandria, Va.). She is the staff liaison for the Collection System Committee and can be contacted at *bnakamura@wef.org*.

From wef hq Leading-edge updates from the Water Environment Federation

By **Kristina Twigg** and **Peter V. Cavagnaro**. Kristina Twigg is the Associate Editor, World Water: Stormwater Management at the Water Environment Federation (Alexandria, Virginia.). Peter V. Cavagnaro is a project development consultant at Johnson Controls Inc. (Milwaukee, Wisconsin).

From Problem to Profit

A Fort Worth water resource recovery facility turns industrial waste challenges into energy opportunities

The Village Creek Water Reclamation Facility in Fort Worth, Texas, lies on Trinity River's west fork. Every day, the facility treats more than 378,541 m^3 (100 million gal) of wastewater. With about 6437 km (4,000 miles) of sewers, the wastewater, carried largely by gravity, can take 8 to 12 hours to travel to the facility. Within this time, flows can become septic, and high-strength industrial wastes can be problematic for local industries to dispose of.

However, the Village Creek plant has turned the problem into an energy solution: Now the facility generates 75% of its electricity onsite.

"The plant's co-digestion program has shifted the industrial wastes to a point in the plant where their energy can be harnessed," said Madelene Rafalko, a senior professional engineer at the Fort Worth Water Department. "By injecting these concentrated wastes directly into the digester, the plant has decreased the amount of energy needed for aeration treatment."

Wastes boost methane production

With the addition of co-digestion waste, the facility has doubled its gas production. However, facility staff are very selective about the wastes they bring in. "We are looking for wastes with high COD [chemical oxygen demand], which are more easily converted to methane," said Jerry Pressley, water systems superintendent. The plant looks for wastes that produce a high gas yield with low residuals but avoid wastes with sulfides and sanitizers because they can cause process upsets, such as digester foaming, he said.

The co-digestion building is where the plant receives industrial wastes. Operators ensure that the wastes do not contain chemicals that would upset the anaerobic digestion process. (Credit: Kristina Twigg)

For 10 minutes every hour, the high-strength wastes are injected into six of the plant's 14 anaerobic digesters. The plant has been capturing digester biogas for decades and uses it to power one of two 5.2-MW turbines. These turbines generate about half of the plant's energy, most of which is used for the plant's aeration system.

Steam heat provides return on investment

However, the Village Creak Water Reclamation Facility has also found a way to reduce the energy needed for its aeration basins.

In the process of using the turbines to generate electricity, heat is also created. The plant has harnessed this heat to make steam, which powers two of the plant's blowers. The heat is also used to warm buildings and anaerobic digesters during winter. Even the steam itself is not wasted – it is condensed and reused.

"The cost savings from the steam process has paid for everything else," Rafalko said. The project, started in 2007, has saved $3 million so far, he said.

Improvements lead to other efficiencies

While the steam process is the largest part of the plant's energy-efficiency program, staff have also taken advantage of low-hanging fruit, such as optimizing process controls, upgrading pumps and motors, replacing its SCADA system, and installing a web-controlled lighting system. "Going through and taking measures helped us to identify maintenance needs and further energy improvements," Pressley said.

The plant also created anoxic zones in six of its 13 aeration basins. In the presence of oxygen, bacteria convert ammonia to nitrate (NO_3). Then in

"Now the facility generates 75% of its electricity onsite. The plant's co-digestion program has shifted the industrial wastes to a point in the plant where their energy can be harnessed. By injecting these concentrated wastes directly into the digester, the plant has decreased the amount of energy needed for aeration treatment"

the anoxic zones, the bacteria can utilize the oxygen present in the NO_3. This eliminates mechanical aeration in these sections of the basins, further reducing the plant's energy needs. These improvements bring the facility one step closer its goal of net-zero energy.

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Kristina Twigg and **Peter V. Cavagnaro**. Kristina Twigg is the Associate Editor, World Water: Stormwater Management at the Water Environment Federation (Alexandria, Virginia.). Peter V. Cavagnaro is a project development consultant at Johnson Controls Inc. (Milwaukee, Wisconsin).

Biogas, used to generate energy via the plant's turbines, is created in these anaerobic digesters fitted with linear motion mixers. (Credit: Kristina Twigg)

The Village Creek Water Reclamation Facility generates both energy and steam. The steam is used to power two of the plant's aeration basin blowers. (Credit: Kristina Twigg)

Using anoxic zones in the aeration basin improves energy efficiency at the Village Creek Water Reclamation Facility. (Credit: Kristina Twigg)

SURCHARGING, Why and How

If you ask the patrons of your service area if they would like to subsidize someone else's sewer bill, I'm sure most, if not all, would say "no". They would think that the person who generated the bill is responsible and should pay it, same as they do theirs.

Given the premise that those who create and discharge high strength waste should be responsible to pay for it, a service area needs to have a surcharge/cost recovery program. Without it, the other patrons are subsidizing the cost to treat another's high strength waste.

Now that we have established that those who created the waste should be responsible to pay for it, the next step is how to set up a cost recovery program. There are several schools of thought, any one of which can be modified to fit the service area's needs. One is to pass an ordinance that all high strength generators, new and old, such as restaurants, fast food places, grocery stores, etc., must install the large outside grease, oil and sand interceptors (GOSI) and sampling manholes. Hopefully, this will trap some of the high strength waste and allow samples to be taken, so that a cost recovery bill can be generated if necessary. The upside to this is that all of the generators can be sampled and billed directly on what they put down the drain. The downside is that every new and existing high strength business has to retrofit their plumbing to install a GOSI and sampling manhole, which is not an easy or cheap proposition.

To do this, an ordinance will need to be passed allowing for a Presumption of Correctness. This states that barring new or more accurate data, that the industry/business average will be presumed to be correct. This will allow existing businesses to continue in the same way and pay the average. New businesses, on the other hand, can be made to install a GOSI and sampling manhole if doing new construction. Or if moving into an existing building, they can be subject to the industry average with an in-floor or under-counter style trap installed.

To generate the industry/business average, like businesses are grouped together such as fast food restaurants, sit down dine-in restaurants and grocery stores, etc. The results of the tests will be averaged for each group and used to generate the industry average cost. The cost will can then be used to generate the cost recovery bill.

If the business thinks the average is too high, they can install a GOSI, sampling manhole and water meter. The results will be used to generate their bill based on what they actually discharge. Usually, once the business looks at the cost to install the GOSI and sampling manhole and weighs it against the "possible" savings or increase, the savings is not there to justify the cost. They are not happy, but pay the average because the return on the investment is not there.

Now that the sample results are in, how do you determine the cost? The number of gallons used can be determined by using winter water use. This eliminates landscape watering being included in the calculation. Water records can be used when the business has a separate water meter. If the business is on a common meter, an industry/ business average has to be established. This can be done using the water records of the similar businesses in relationship to the number of square feet of those businesses. This provides an average a gallon per square foot that can be applied to other like kind businesses.

For high strength such as Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS) and Oil and Grease, etc., the bill can be based directly off the treatment costs. For example the treatment plant says it costs $.10 to treat a pound of BOD. The sample results or industry average is 480 mg/l of BOD, using the pounds formula lbs per day = concentration in mg/l X flow in MGD X 8.34 lbs / gallon. Using the sample data from above lbs/ day = 480 mg/l X .02 MGD X 8.34 lbs/gal., yields 80.064 lbs X $.10 treatment cost/lb = $8.00 for BOD

There are lots of ways to set up a cost recovery program or modify an existing one to fit your service areas needs. The main focus is to make it fair to all rate payers. May the flow always be at your back as you journey through the sewers of life. Dn

Collections College

Safety Culture

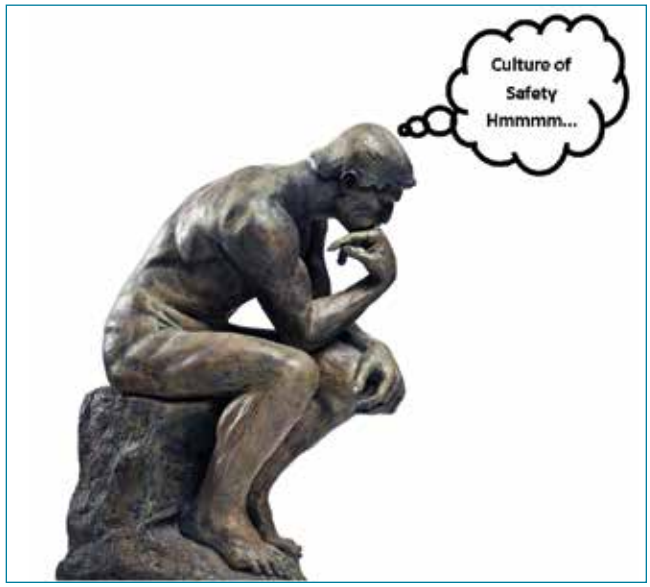
There are many things that define our safety programs. Perhaps an aggressive training program provides a more informed and better trained employee. Possibly routine safety inspections or monitoring the effectiveness of PPE as well as other things set us apart from our peers. Possibly the most significant workplace safety element is the acceptance by employees and managers of a safety culture. A company with a strong safety culture typically experiences fewer at-risk behaviors, resulting in lower accident rates, absenteeism, and higher productivity. These are companies that are extremely successful in all aspects of their business, including worker excellence. This idea concept will inspire workers to change behaviors and make safer choices on their own and not because big brother is watching you.

Employees are taught to understand the effects of wearing and using appropriate safety equipment, ensuring their own protection and looking out for the safety of their coworkers. In a strong safety culture, everyone is responsible for safety and pursues it on a daily basis. Employees go beyond "the call of duty" to identify unsafe conditions and behaviors, and intervene to correct them. In a strong safety culture any worker would feel comfortable walking up to his supervisor, plant manager, or member of management and reminding him or her to wear safety glasses. This type of behavior would not be viewed as forward or over-zealous, but would be recognized by the organization. Likewise, coworkers should routinely look out for one another and point out unsafe behaviors to each other.

Improving a safety culture takes time, sometimes many years. A series of continuous improvements must be made in order to refine a safety culture. Employer and employee commitment are the hallmarks of a true safety culture where safety is a fundamental part of daily operations. One major effort in this area involves more employee participation in safety decisions, for instance, a fully functioning Safety Committee consisting of representatives from each department made up of operations-level employees. This committee develops the goal that each employee has a voice in his or her own safety, not just direction from the management. Another initiative utilizes Tailgate Safety Meetings. In order to foster employee safety consciousness, a supervisor conducts weekly meetings, customized for each department. The supervisor takes this opportunity to brief his/her department on different topics such as newly available safety equipment, changing regulations, or adjustments to safety processes necessitated by a change in the type of work to be engaged.

Creating a safety culture is a cooperative venture. A safety culture requires executive leadership as well as employee ownership of program goals in order for the program to become second nature - ideally a seamless act that each employee engages in without thought, as if the action were to put on a pair of pants before leaving the house. It is an objective that enables us to move into a future where accidents are not acceptable as something that just "happens". We know that "accidents" are preventable and accept the responsibility for ourselves and our coworkers to prevent them. DN

WEAU Safety Committee
Contact us: *csimmons@ndsd.org*



> "Possibly the most significant workplace safety element is the acceptance by employees and managers of a safety culture. A company with a strong safety culture typically experiences fewer at-risk behaviors, resulting in lower accident rates, absenteeism, and higher productivity.

Toolbox Safety Talk

Multitasking and Safety

Are you a good multitasker? Are you one of those who can efficiently do two (or more) things at once and still be safe? Most studies show it may be harder than you think… humans cannot do two tasks that require deliberate thought at the same time.

When we are performing more than one task at a time, only one is being directed by the executive system located in the frontal lobes; this is often called the conscious part of our brain. The other task(s) occurs within our subconscious or unconscious mind. One requires intentional thinking, the other happens on autopilot.

When we are performing two tasks at the same time, we are switching back and forth very quickly. When people mention “multitasking”, they are really referring to task-switching. Considering this, while conducting a safety sensitive task if you divert your attention to answer a text, phone call, conversation with a fellow employee, etc. there is a good chance you’re not giving your full attention to the hazards, this is when you are most venerable to an accident.

Our Treatment and Collection system operators, and Laboratory personnel perform some very hazardous activities, operation of moving equipment, hazardous chemicals, gases, biohazards, etc. This kind of work demands that you to focus **all** of your attention on each of these tasks in order to prevent an accident.

WEAU Safety Committee
Contact us:
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Toolbox Safety Talk

Wastewater Workers Watch Your Back!

Back injuries may be difficult to treat and may have lengthy and expensive rehabilitation times. When you are lifting at home or at work, make an effort to take care of your back.

The National Safety Council recommends a number of tips to prevent unintentional injuries and help to **Watch Your Back**.

1. Take a balanced stance with your feet about a shoulder-width apart. One foot can be behind the object and the other next to it.
2. Squat down to lift the object, but keep your heels off the floor. Get as close to the object as you can.
3. Use your palms (not just your fingers) to get a secure grip on the load. Make sure you'll be able to maintain a hold on the object without switching your grip later.
4. Lift gradually (without jerking) using your leg, abdominal and buttock muscles and keeping the load as close to you as possible. Keep your chin tucked in so as to keep a relatively straight back and neck line.
5. Once you're standing, change directions by pointing your feet in the direction you want to go and turning your whole body. Avoid twisting at your waist while carrying a load.
6. When you put a load down, use these same guidelines in reverse.

Think… Just a few seconds of pre-planning before you lift a heavy object can save you a lot of pain now and help you to avoid chronic pain in the future.

WEAU Safety Committee
Contact us:
csimmons@ndsd.org

Water Environmental Association of Utah

PWO Operator Scholarship winners:

Jonathan Gubler

Jonathan started his career with Cottonwood Improvement District in 2005 where he worked on a line flushing crew. He is currently working with a manhole maintenance crew doing repair work and raising manholes. Jonathan likes his job and said he is excited to have a good job he enjoys and looks forward to coming to work each day. He is grateful to Cottonwood Improvement District for providing a great place to work and for having good people to work with.

Jonathan's main interests are his family first, his wife Laura and 4 boys, Jordan 17, Twins Ian and Zayden 9 and Liam 4. He likes being outdoors camping and hiking and also enjoys cycling. He is the scout master of his local scout troop and enjoys being with the boys.

Jonathan is enrolled at SLCC this fall where he will be taking classes to obtain his Associate's degree in business management. He is grateful for this scholarship and hopes to use his degree to continue his career.

Jordan Boone

Jordan started his career in Wastewater in 2005 when he went to work with CH2M Hill as a maintenance specialist, MMP2 administrator and an Operator in training in Florida. In 2007 his wife Meghan convinced him to move closer to her family which landed him in Provo. In May of 2008 he landed a job at Provo City working at the Water Reclamation Facility as a maintenance supervisor. In 2011 South Valley Sewer District opened its new Jordan Basin WRF and Jordan started there as a maintenance operator 3.

Since coming to South Valley Sewer, Jordan has attended training and become certified in I Fix fundamentals, I Fix Advanced, VBA for I Fix, and PLC programing. Jordan also has an ISA certification as a control systems tec. Level 1. Jordan's career goal is to be an IT specialist.

Jordan enjoys his job and the people he works with and especially enjoys spending time with his family especially his girls Layna 10 and Olivia 6. He loves to take his family camping and one of his favorite places to go is Las Vegas.

Jordan is enrolled at SLCC this fall where he will be working on an Associate's degree in Computer Science. He is grateful for this scholarship and hopes to be able to show his appreciation by doing well in school.

Thank you to all who applied for the scholarships and congratulations to Jonathan and Jordan for winning this year. More scholarships will be available next year so plan to apply.

Rural Water Operator Certification Trainings for 2015

- August 31 – September 1, 2015 (Water & Wastewater Operator Certification, Fall Conference, Layton, Utah)
- October 20 – 22, 2015 (Water & Wastewater Operator Certification, Cedar City, Utah)
- October 27 – 29, 2015 (Water & Wastewater Operator Certification, Ogden, Utah)
- November 3 – 5, 2015 (Water & Wastewater Operator Certification, Provo, Utah)

Rural Water's classes are going to be held in Ogden October 27-29 and Utah Co November 3-5. The cost of the class is $205 for members and $305 for nonmembers. For more information their website is *rwau.net* and the page regarding the training is *http://www.rwau.net/RegisterForOpCert.html*

We offer the training and written exam at our Conference in Layton (Davis Convention Center) August 31-September 2 with the exam on September 3. The fall training will be October 27-29 in Ogden and November 3-5 in Provo. The written drinking water exam is scheduled for November 12 with the application deadline on October 22.

Visit our website: ***rwau.net***

YP Recap

This year at the Annual WEAU conference our YP's hosted 4 activities including: bowling fundraiser, YP breakfast, blood drive, and Cedar City WWTP Tour. All the events were a success. The bowling fundraiser and blood drive were particularly successful. WEAU YP's raised $1,000 for Water for People, which was matched by WEAU for a total $2,000 donation. Also, the response for the blood drive was tremendous and the Red Cross actually ran out of donation kits. WEAU YPs also participated in the Operator's BBQ and hosted the presentation by the winning WEFTEC Student Design Team, prior to their competing at WEFTEC this coming fall. We would like to showcase Sara Hopp for receiving the Award for Outstanding YP in the WEAU for 2015.

Michael Foerster, WEAU President

Aimee Nelsor, South Valley Water Reclamation

YP Future Activites

We are excited to announce the annual Salt Lake Bees baseball game on Friday July 17th vs the Reno Aces is happening again. Picnic starts at 6:05PM; first pitch at 7:05. Please RSVP about a week before to get your ticket, exact date tbd.

Visit us online for the latest news and updates:

www.weau.org

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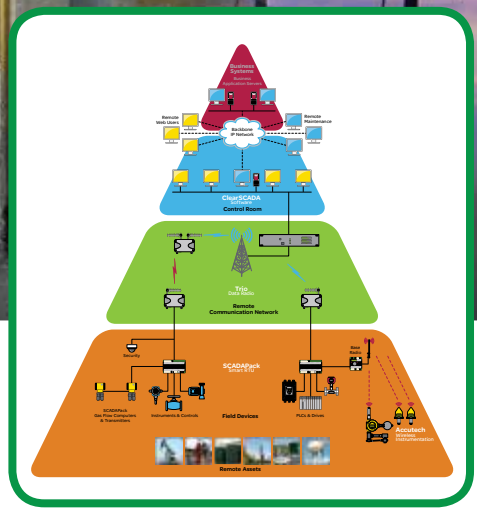

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