SPRING
2016

The Official Publication of the Water Environment Association of Utah

DIGESTED news

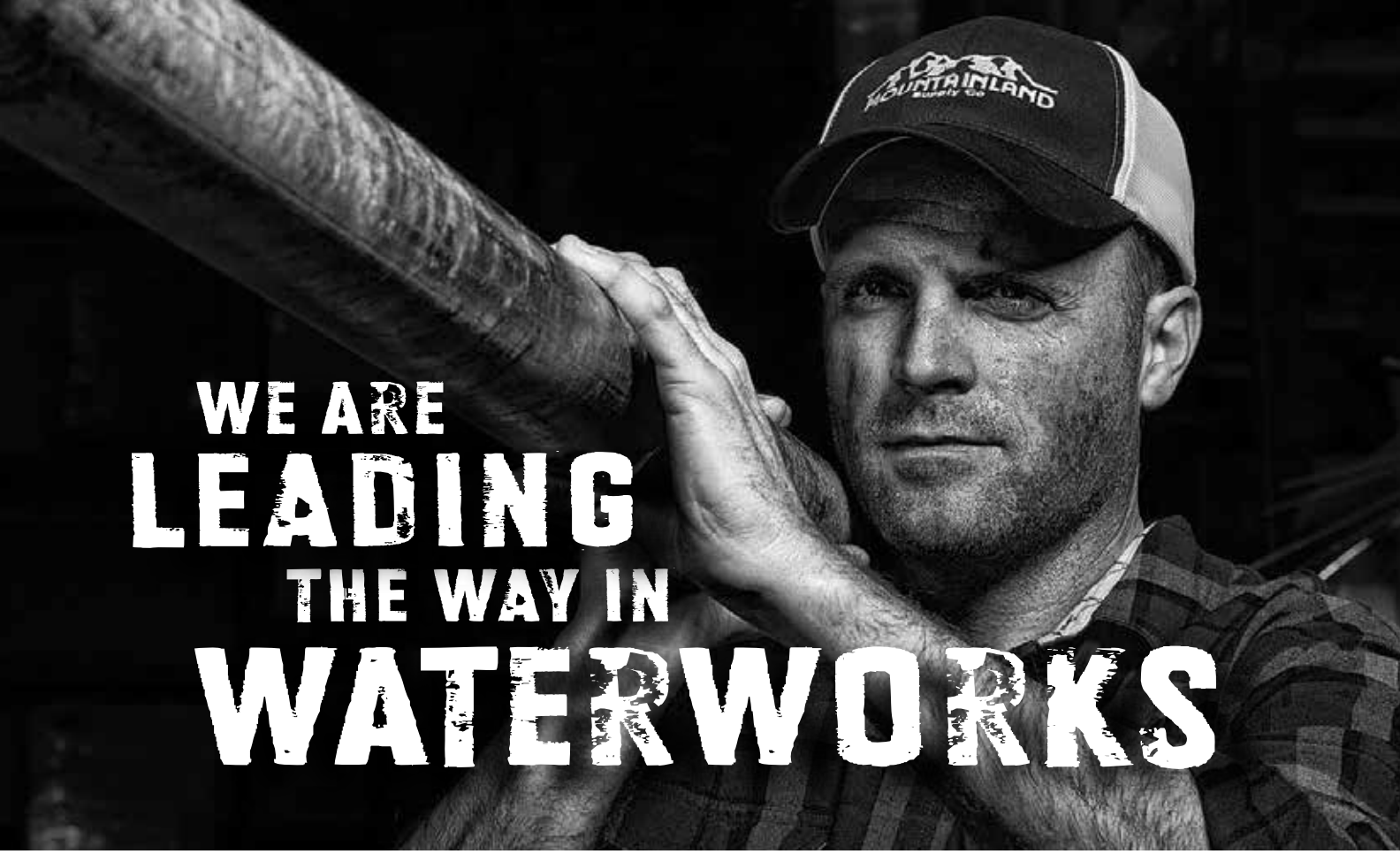
Celebrating 50 Years of Clean Water

2016 WEAU Annual Conference Preview

APRIL 26-29 | DIXIE CENTER, ST. GEORGE UTAH

Snyderville Basin Water Reclamation District
2800 Homestead Road
Park City, Utah 84098
Address service requested

INSIDE:



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WEAU 2016 CONFERENCE

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Contents

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FEATURES

Departments

WEAU has Momentum!

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

It's that time of year again, when the WEAU Board and committee members are working hard to prepare for the Annual Conference. The conference will be held April 26 – 29 at the Dixie Center in St. George. The conference committee has put together a great program full of fantastic material for all levels of wastewater professionals and the conference has continued to evolve and grow. From the preconference session on the latest innovations in wastewater treatment and collection, to the expanded and diverse technical program and vendor displays, the conference is on track to be larger and better than ever. Along with the technical training there will be plenty of additional outside activities. Take the opportunity to enjoy your time in St. George and participate in one or more of the fun events.

In reviewing the past year, I am amazed at how much has been accomplished and how fast the time has passed. As an engineer, let me translate this for you into engineering terms: WEAU's Momentum is Increasing! Momentum is the measure of the strength of force of an object when it's moving or the product of its mass and velocity. The bigger the object (i.e., the greater its mass) and the faster it is moving (i.e., the higher its velocity) the greater its momentum. So it is for WEAU, there is increasing momentum because there is a greater mass from our growing membership and activities and there is greater velocity from the pace of our growth and activities. Momentum not only has magnitude but also possesses the property of direction. For WEAU, under the leadership of our Board and Committee Chairs I believe our increasing momentum is moving in the right direction of providing great training and opportunities to enhance the skills and professionalism of our membership.

This last year has been full of hard work and lots of meetings which have resulted in many great conferences, trainings and fun activities. It takes an amazing number of people to run an organization like WEAU and what is even more amazing is how many people are willing to help out. I would like to give a special thanks to the employers who allowed their staff time off their regular jobs to volunteer over the past year. WEAU recognizes the stress this places on your business operations and appreciates the sacrifice made to let your staff members serve and participate in our events.

As our momentum continues to increase, please consider ways you can help and then jump in with both feet and join us. Since WEAU is a completely volunteer organization we are always in need of enthusiastic help. I invite everyone, especially Young Professionals, to get involved. Don't be shy, contact any WEAU Committee Chair or Board member and let them know you would like to get involved and what your interests are. I promise you that if you do, you'll make new friends, and it will be a rewarding and career enhancing experience.

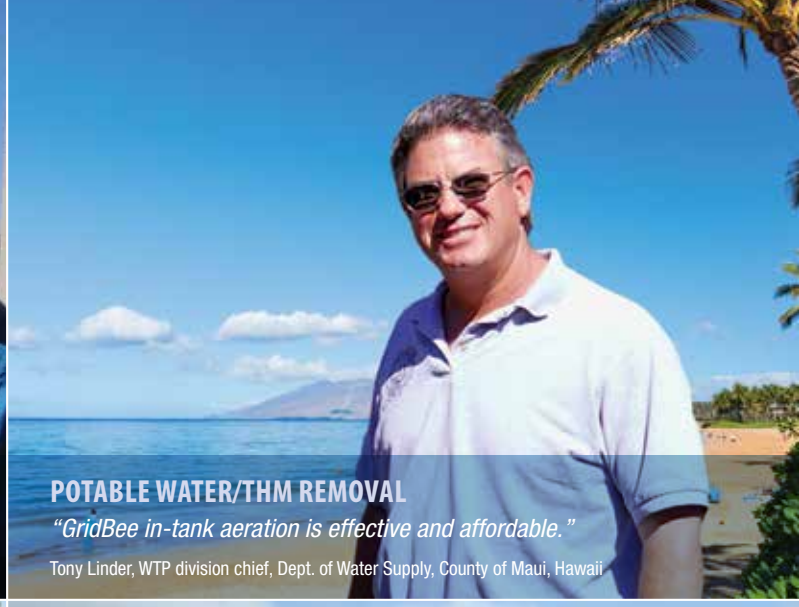
I have really enjoyed the past year as President of WEAU and the association with individuals in the wastewater industry and in WEAU. Thanks to all of you for a great year and have a safe trip to the conference in St. George! dn

Thank You,
Phil Heck, Ph.D., P.E.
President

POTABLE WATER MIXING/ICE PREVENTION

"These mixers give peace of mind, especially in winter."

Cary Johnson, water operations mgr., Rochester Public Utilities, Rochester, Minnesota



POTABLE WATER/THM REMOVAL

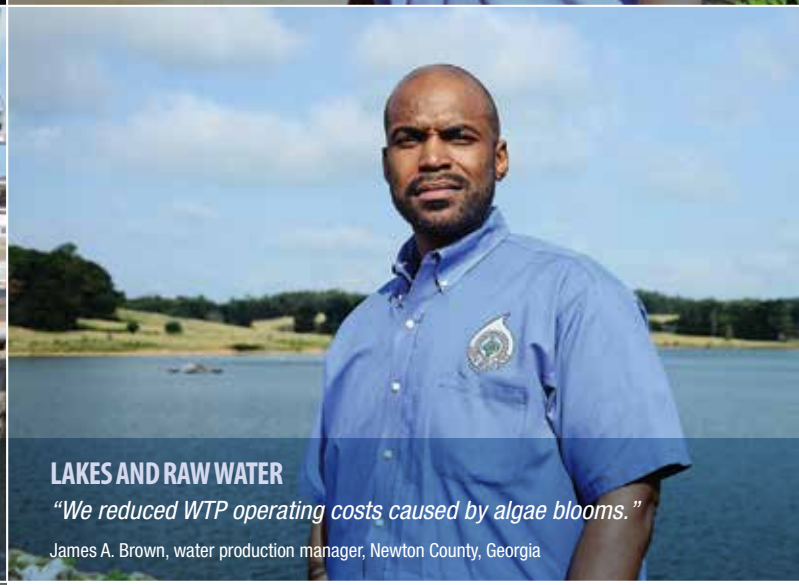
"GridBee in-tank aeration is effective and affordable."

Tony Linder, WTP division chief, Dept. of Water Supply, County of Maui, Hawaii

WASTEWATER MIXING/BASINS AND LAGOONS

"We reduced our nitrate levels and lowered our energy costs."

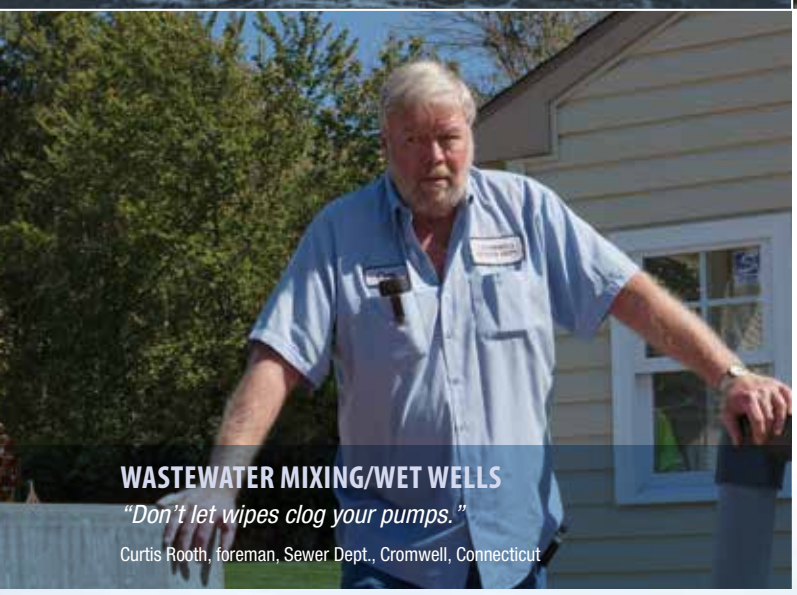
John Willis, wastewater plant supervisor, Ventura, California



LAKES AND RAW WATER

"We reduced WTP operating costs caused by algae blooms."

James A. Brown, water production manager, Newton County, Georgia



WASTEWATER MIXING/WET WELLS

"Don't let wipes clog your pumps."

Curtis Rooth, foreman, Sewer Dept., Cromwell, Connecticut

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Editor's Message

Begin with the end in mind

Chad Burrell

I hope you are all enjoying the fact that spring is just around the corner As one who does not downhill ski but manages to work in a skiing community, I hope I don't get myself in trouble by saying I am glad to see the snow starting to melt! As excited as my kids get at the first snowstorm in the fall, they too are done with making snow caves in the front yard and shoveling walks. I sometimes find myself beginning the winter months with the "end" in mind!

This mindset could be applied to our careers. Do we ever tackle projects at work with the focus of the end product or service always in the back of our minds? Is our vision of how we want something to be completed guided by worthwhile goals and objectives along the way? How many of us are looking forward to retirement? In essence retirement might be the "end" that guides our financial decisions, career decisions, family decisions, and habits so that we can leave behind a legacy for others to follow. Please don't let my reference to retirement being the "end" come across to harshly, instead I would like you to focus on the fact that our trek toward retirement should be one with the idea of leaving a legacy. To help illustrate this you will find in this issue of the *Digested News,* three articles put together by Jeff Wiest highlighting individuals in our industry that have done just that, left a legacy. Between the three of them there is over 130 years of experience working it the field of wastewater. It would be interesting to ask them if 40 years ago they had any idea they would be where they are at today. I hope you enjoy what has been put together.

So to those of us that still have many more years in the "trenches" or should I say "sewers", lift your heads up, be proud of your career, because as you learn to enjoy what you do, you will eventually end up doing what you enjoy, and that is something we should never retire from! DN

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2016 WEAU Annual Conference Preview

APRIL 26-29 | DIXIE CENTER, ST. GEORGE UTAH

WEAU PRE-CONFERENCE WORKSHOP: APRIL 26, 2016 (8:00am-1:00pm)

INNOVATIONS IN WASTEWATER COLLECTION AND TREATMENT

8:00 am: Light Breakfast, Coffee, Juice

8:30 am: **Introduction opening speech**: An overview about energy neutrality and resource positivity of WWTPs. Dr. Ramesh Goel, University of Utah.

8:45 am: **Presentation 1**: Bits and Bytes and Bugs – On Monitoring and Control in WRRF's (aka WWTPs); Dr. Peter A. Vanrolleghem (IWA & WEF Fellow), Professor and Canada Research Chair on Water Quality, Université Laval's Civil and Water Engineering Department.

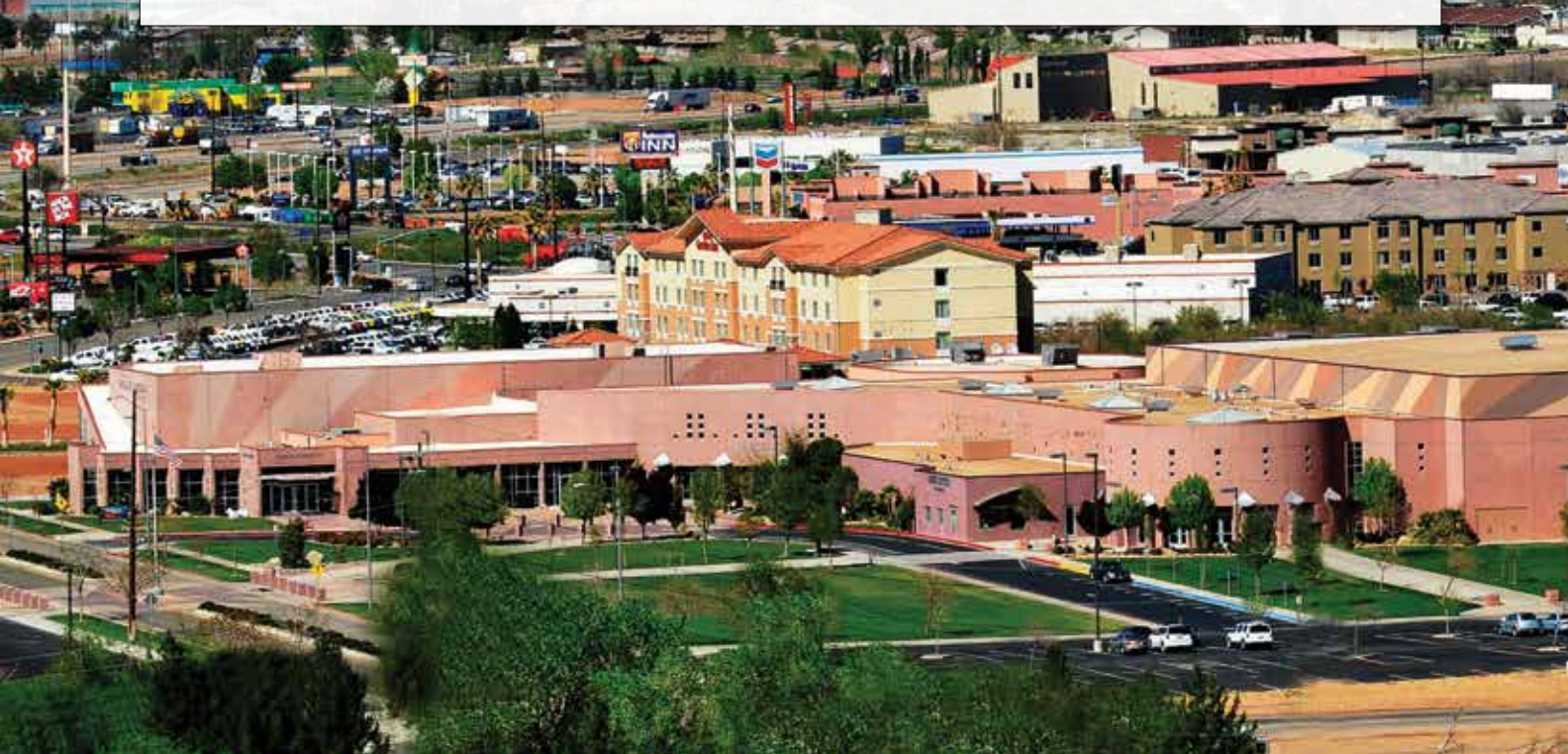
9:30 am: **Presentation 2**: Phosphorus Recovery in Water Resource Recovery Facilities - Beyond Struvite. Dr. Krishna Pagilla (IWA & WEF Fellow), University of Nevada, Reno.

10:15 am: Break with Refreshments

10:45 am: **Presentation 3**: Managing Certainty and Uncertainty: Bridging the Gap by Incorporating Innovative Technology in Wastewater Treatment: Dr. Art K. Umble, Wastewater Practice Leader, MWH Global.

11:30 am: **Presentation 4**: Trends and Innovation in Collection System Design, Assessment, and Rehabilitation: Brandon Heidelberger, PE, Brown and Caldwell.

12:30 pm: Box Lunch



WEAU Annual Conference 2016

APRIL 26-29 | DIXIE CENTER, ST. GEORGE UTAH

Draft Technical Program Schedule

Wednesday	Sunbrook A	Sunbrook B	Sunbrook C	Entrada A	Entrada B	Entrada C	Exhibit Hall
8:00 - 9:00	Water Quality Board Meeting - Garden Room						Exhibitor Challenge Ongoing Exhibits Open
9:00 - 10:00							Exhibitor Challenge Ongoing Exhibits Open
10:00 - 11:00							Exhibitor Challenge Ongoing Exhibits Open
SESSION A Wednesday, April 27	Sunbrook A	Sunbrook B	Sunbrook C	Entrada A	Entrada B	Entrada C	Exhibit Hall
		UASD Training	WWTP Design	Collections	Nutrients	Operations	
	Moderator - TBD	Moderator - TBD	Moderator - TBD	Mod. - Lonn Rasmussen	Moderator - TBD	Moderator - TBD	
1:30 - 2:05	Closed	Utah Association of Special Service Districts – Training for District Board Members *Legrand Bitter*	Coalville City WWTF – Ready for the Future *Jim Goodley*	Use Your Model to Stay Out of Trouble *Chris Slater*	Worried About How to Meet Phosphorus Limits at Your Facility? Examples of Recent Cost-Saving Process Conversions *Tanja Rauch-Williams*	UPDES Electronic Reporting Rule or What Are You Going to Make Me Do Now *Matthew Garn*	Exhibits Open
2:10 - 2:45	Closed		The City of Las Vegas Water Pollution Control Facility Gets a Solid Makeover *Regina Davis*	Design and Application of Low Pressure Sewers *Chuck Mayhew*	Alum and Ferric Addition for Ultra Low Phosphorus and the Impacts Upon the Entire Plant *Bruce R. Johnson*	What POTWs Can Do to Minimize the Chance of Having Analytes Identified as Having "Reasonable Potential"and Being Added as Limits to Their Discharge Permit *Lee Rawlings*	Exhibits Open
2:45 - 3:30	Break - Exhibit Hall						
	Sunbrook A	Sunbrook B	Sunbrook C	Entrada A	Entrada B	Entrada C	Exhibit Hall
		UASD Training	WWTP Design	Collections	Nutrients	Operations	
3:30 - 4:05	Closed	Utah Association of Special Service Districts – Training for District Board Members *Legrand Bitter*	Snowbasin On-Site Wastewater Treatment System and the Challenges of a Drain Field Built on a Ski Slope *Brad Rasmussen*	Wiping Away the Nightmare of Non-Dispersibles *Paul Schuitt*	Nutrients in the Great Salt Lake Wetlands: The Importance of Sediment Fluxes and Biogeochemistry *Scott Teeters*	Ultrasonic vs Radar – How to Know Which is Better *Mark Klee*	Exhibits Open
4:10 - 4:45	Closed		Using SBR Technology to Cost Effectively Accommodate Future BNR Requirements *Dennis Barnes*	South Valley Sewer District – Inverted Siphon at 13800 S. and the Jordan River Sewer Project Overview *Steven Meyer*	Utah Lake – A Little on its History and Nature *LaVere B. Merritt*	SCADA System Upgrade – A Collaborative Design/Build Success Story *Matthew Hatch*	Exhibits Open

SESSION B Thursday, April 28	Sunbrook A	Sunbrook B	Sunbrook C	Entrada A	Entrada B	Entrada C	Exhibit Hall
	Pretreatment	Retirement - URS	Sustainability	Collections	Nutrients	Operations	
	Moderator - TBD	Moderator - TBD	Moderator - TBD	Moderator - Dakody Gines	Moderator - TBD	Moderator - TBD	
8:30 - 9:05	Pretreatment 101 (Introduction to Pretreatment) *Adam Butterfield*	Utah Retirement Systems – Tier 1 Presentation TBD	Water Reuse Opportunities and Considerations *Donald Champenois*	Cleaning Round Table Discussion *Dan Story*	Anoxic Methane Oxidation Coupled to Denitrification (n-DAMO): A Sustainable Approach to Wastewater Treatment *Ananda Shankar*	Jar Testing Considerations and Solids Impacts *David Hatch*	Exhibits Open
9:10 - 9:45	Engineering with Confidence; Solutions for the Operational Management of Fats, Oils, & Grease (FOG) *Kent Proctor*		Looking Forward to Indirect Potable Reuse *John Matta*	Looking Through the Inside *John Marteliz*	Trickling Filters Traded for Activated Sludge and TIN Reduction *Darrell Olmsted*	TBD	Exhibits Open
9:45 - 10:30	Break - Exhibit Hall						
	Sunbrook A	Sunbrook B	Sunbrook C	Entrada A	Entrada B	Entrada C	Exhibit Hall
	Risk Management	Retirement - URS	Sustainability	Collections	Nutrients	Operations	
10:30 - 11:05	What Do You Say When Things Go Wrong *Steve Frank*	Utah Retirement Systems – Tier 2 Presentation TBD	Ozone and Wastewater? A Multi-solution Process for Advanced Treatment of Wastewater for Reuse *Michelle Barry*	CVWRF Siphon Rehabilitation *Peter Duberow*	Energy and Resource Positive Wastewater Treatment Plants (WWTPs) *Md Imdadul Islam*	TBD	Exhibits Open
11:10 - 11:45	Planning for Environmental Risks that Arise from Collections and Plant Operations *Darrell Child*		Five Key Factors That Will Determine the Future of the Wastewater Industry *Jared Oldroyd*	Sealing your Wastewater Collection System *Michael Jereb*	Side Stream Treatment Technologies – How Do They Play in Utah's Nutrient Removal Requirements? *Henryk Melcer*	TBD	

SESSION C Thursday, April 28	Sunbrook A	Sunbrook B	Sunbrook C	Entrada A	Entrada B	Entrada C	Exhibit Hall
	Asset Management	Project Delivery/Biosolids	Sustainability	Collections	Nutrients	Safety	
	Moderator - TBD	Moderator - TBD	Moderator - TBD	Moderator - Dean Ayala	Moderator - TBD	Moderator - Shellie ?	
1:30 - 2:05	Twelve Years of Asset Management (Part 1) – Introduction and Elements of an Asset Management Plan *Mike Luers*	cent Design and Construction Experiences Using CMGC Project Delivery *Gary Vance, PE*	Tertiary Filtration Options to Meet Low-P Limits and Produce Class 1 Reuse Water *Randy Zollinger*	Lessons Learned in Open-cut and Microtunneling of Goleta West Sanitary District Mesa Road Trunk Sewer *Bijan Khamanian*	Nitrogen Transformation at Sediment-Water Interface in the Jordan River, Utah *Shaikha Abedin*	Building a Lasting Safety Culture *Kevin Cowan*	Exhibits Open
2:10 - 2:45	Twelve Years of Asset Management (Part 2) – Lessons Learned and Benefits Gained *Gary Tackman*	Biosolids Purgatory – Constructing the Last Stop on the Road to Land Application *Mike Kobe*	Benefits of Advanced Online Control for Ozoneenhanced Biologically Active Filtration System for Municipal Water Reuse *Abigail Antolovich*	So You Need a New Trunkline – Lessons Learned Throughout the CWSID BDO Outfall Project *Bryan Mansell*	Advanced Nutrient Management in Engineered Wetlands *David Austin*	Hazard Mitigation Planning – What are Your Utility's Plans to Manage Risk? *Byron Elwell*	Exhibits Open
2:45 - 3:30	Break - Exhibit Hall						
	Sunbrook A	Sunbrook B	Sunbrook C	Entrada A	Entrada B	Entrada C	Exhibit Hall
	Innovative Equipment	Misc WW Topics	Misc WW Topics	Collections	Nutrients	Laboratory	
3:30 - 4:05	Development of an Accessible Inclined Orientation UV Disinfection System Permits Smaller Footprints for Larger Treatment Systems *Steve Green*	Optimization of Biological Process Mixing and Aeration Systems – The Case for Jets *Larry DeBirk*	Ammonia and Mussels: Should EPA's New Ammonia Criteria Apply to Utah Lake and the Jordan River? *Theron Miller*	Pump Station preventative maintenance. Best practices to maximize efficiency and minimize downtime. *Blaine Bowden*	Innovation in Conventional Wastewater Treatment Process with Reduced Footprint *Sunayna Dasgupta*	Monitoring for Phosphorus Release and Up-take in a Biological Phosphorus Removal System Using Real-time Instrumentation Monitoring vs Conventional Laboratory Testing *Dave N. Commons*	Vendor Breakdown
4:10 - 4:45	New Progressive Cavity Pump Technology Reduces Costs and Significantly Cuts Maintenance Time *Kevin Tomas*	Pharmaceuticals vs EDCs: Which Poses Greater Aquatic Risk? *Michael D. Luers*	Utilization of Bio-Trickling Filters for Eliminating Odors Case Study at Headworks of the Wastewater Treatment Plant in Fort Wayne, IN *Ashraf Aly Hassan*	The Large Diameter Dilemma *Ryan Broadhead*	Earth Renewal Group Technology – Panel discussion, Question and Answers From Your Peers *Malcolm Draper*	Microbial Source Tracking: An Innovative and Practical Approach to Microbial Pollution in Water Bodies *Ahmed Karimi*	Vendor Breakdown

SESSION D Friday, April 29	Sunbrook A & B	Sunbrook C	Entrada A	Entrada B	Entrada C	Exhibit Hall
	Moderator - TBD	Moderator - TBD	Moderator - Pete Duberow	Moderator - TBD	Moderator - TBD	
8:00 - 8:30	WEFTEC Design Competition Student Paper Presentation - location TBD					-
8:30 - 9:15	Regulatory Status Update *TBD*	-	Trenchless Manhole Rehabilitation Good Practices *Jeff Maier, PE*		Operator Challenge Process Test Review *TBD*	-
9:15 - 10:00		-	Sewer Rehabilitation: One City's Success Story *Brad Conder*			-
10:00 - 10:45		-	Collection System Jeopordy - M*ichael Foerster*			-

WEAU Annual Conference 2016

APRIL 26-29 | DIXIE CENTER, ST. GEORGE UTAH

You're Invited!

2016 WEAU Annual Golf Tournament

Format: Four-person scramble
When: Tuesday, April 26, 2016 • Shotgun start at 1:30 pm
Where: Sunbrook Golf Course, St. George, Utah
Green Fees: $50.00 per person (includes cart and lunch)
Lunch: Box lunches & drink provided (available at 12:00 pm)
Contact: Jeff Beckman, Bowen, Collins & Associates, 154 East 14000 South, Draper, UT 84020, (801) 495-2224, *jbeckman@bowencollins.com*

Register online at *www.weau.org* or by returning this registration form to Jeff Beckman (see above) along with a check payable to WEAU Golf Tournament.

Contact Jeff Beckman at (801) 495-2224 for team preference, or we will match singleplayers to fill foursomes.

Registration forms and fees are due by April 15th, 2016.

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WEAU Annual Conference 2016

APRIL 26-29 | DIXIE CENTER, ST. GEORGE UTAH

Registration Form

Members can pay online at *www.weau.org* or register by filling out this form and sending in a check. To expedite processing, we encourage you to register online. When you register online, you will have the option to pay with a credit card or transfer funds from a checking account.

Name _____

Company _____ Membership Number _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____ e-mail _____

Late registration cannot guarantee a registration gift

General Conference Registration Fees			
	Pre-Register – Prior to April 17, 2016	Registration after April 17, 2016	Amount
Member	$275.00	$375.00	
Non-Member	$320.00	$420.00	
Student	FREE		
Wednesday or Thursday (one day)	$175.00 member $190.00 non-member	$185.00 member $200.00 non-member	
Pre-Conference: April 29*	$100.00 (Includes Box Lunch)		
Extra Lunch**	$20		
Banquet Dinner**	$30		
		Total Enclosed:	

* See *www.weau.org* for details
** For guests of conference attendees

Please do not submit your form without payment!
Registrations received without payment will not be processed (No P.O.s, No Credit Cards except online).

TO REGISTER: Go online and use a credit card or complete this form and make checks payable to WEAU and mail to:
WEAU, PO Box 651028, Salt Lake City, UT 84165-1028

PLEASE DO NOT SEND REGISTRATION AFTER APRIL 10, 2016
AFTER THIS DATE YOU MUST REGISTER ON-SITE OR ONLINE.

View the draft Conference Program at: *www.weau.org*
Conference Program will be updated regularly on the website; check back often.

Conference Information

When you register for the WEAU annual conference the following is included in your fee:

	Wednesday Opening Luncheon	Thursday Luncheon	Thursday Awards Banquet	Break Refreshments
Full Conference	Yes	Yes	Yes	Yes
Student	Yes	Yes	Yes	Yes
Wednesday Only	Yes			Yes
Thursday Only		Yes	Yes	Yes

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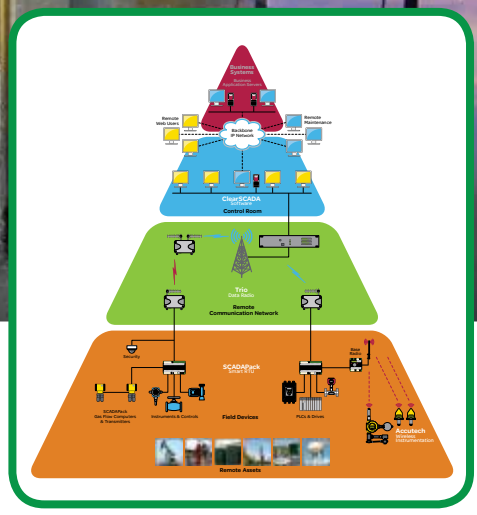

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Schneider Electric

2016 R8PA Annual Pretreatment Workshop

By Sarah Leavitt

Registration: To register for the 2016 R8PA Workshop visit the registration page at *R8PA.com*. Payment can be made via check or PayPal.

Hotel: We will be hosting this year's workshop at DoubleTree by Hilton Hotel, Durango, Colorado. **For reservations:** Contact the DoubleTree by Hilton Hotel Durango at 1-970-259-6580 and refer to the Region 8 Pretreatment Association Conference Group. Rooms must be booked by April 9, 2016 to receive the conference rate. Hotel space is always limited, so make reservations as early as possible.

Agenda: Check out the Agenda at www.*R8PA.com* to see this year's topics and presenters.

Networking Events:
Join us for some great networking events.

Membership
The Region VIII Pretreatment Association is a group of pretreatment professionals located in EPA Region VIII who are responsible for addressing current pretreatment issues, assisting approved and non-approved pretreatment programs with pretreatment questions and providing education for all pretreatment individuals within the region.

EPA Region VIII and the Region VIII Pretreatment Association (R8PA) conjointly developed an annual workshop to address the various needs of municipal pretreatment personnel to implement the pretreatment regulations. Basic to advance pretreatment training, discussions, and presentations will be provided by local, state, and federal government representatives, as well as experts outside the government.

The Region VIII Pretreatment Association is open to all pretreatment professionals who wish to be part of the general membership. There are not membership fees and there is an expectation that each member will provide input on core activities. The Region VIII Pretreatment Association depends heavily on volunteers to help achieve the association goals. DN

> Check out the website at *www.R8PA.com*.

A Quick Review of Annual Inspections

By Sarah Leavitt

There are many things Pretreatment Personnel have to do; one of those is Annual Inspections. With a new year, the Annual Inspections start back up again. So, why do we have annual inspections? It all falls back on the good ol' 40 CFR. In section 403.8(f)(2)(v) it requires POTWs, through the Pretreatment Program, to inspect all permitted Significant Industrial Users (SIUs) at least once a Pretreatment year. What does a Pretreatment year mean? Annual Inspections must be completed within 365 days of the last inspection. This is a federal regulation, but POTWs can add additional inspections.

What type of information is gathered from an inspection?

- Perform sampling at SIUs
- SIUs current data
- SIUs compliance status
- Accuracy of IU's records
- Develop relationship with SIUs
- Evaluate for any changes at SIUs
- Evaluate overall performance of pretreatment system

How do you prepare for an inspection?

Pretreatment Personnel should review the POTWs regarding SIUs activity over the previous year. The information reviewed can include compliance status, compliance schedule activities, reports, plans, enforcement activities, permit expiration, and all other such paperwork.

When you arrive at a SIU, be prepared to discuss their operations with personnel and walk through the facility. An inspection questions or report is used to facilitate during the inspection. The report can vary in length, depending on the POTW.

After the inspection, Pretreatment Personnel prepare a report and letter. It is best to start the letter soon after you return to the office. The letter can help answer, unanswered questions, review required permit modifications and any enforcement actions. The letter and report will be sent to the SIU after the sample analysis is returned from the lab.

Excerpts taken from "Introduction to the National Pretreatment Program" June 2011. DN

> "Annual Inspections must be completed within 365 days of the last inspection.

PWO Presidents Message:

By Gordon Evans

I have been thinking about the value of water lately and some of the things we us it for that we may not normally think about. My wife and I recently took a cruise to Panama to see the Canal. I watched from our balcony, while our ship entered into the Locks and was transported through them to Lake Gatun, I was amazed and awed, at this engineering marvel. Some of the interesting facts about the canal and the locks that I learned might be of interest to you.

The canal was first talked about in the 1600's, when Spain was trying to find a way to get from the Caribbean Sea to the Pacific Ocean, faster. The actual construction of the canal was began by the French in 1881 and was later abandoned by them, after spending $287,000,000 us dollars and the loss of over 22,000 men to disease or injury. In 1904 the U.S. purchased the canal and the rights to finish the construction from the French for less than $0.40 on the dollar. The U.S. was able to complete the canal and the first ship passed through, in August of 1914. To date more than 14000 ships pass through the locks each year.

The locks themselves are 110 feet wide and 1050 feet long. There are three locks on each side, totaling about 1.2 miles of total length that the ships must pass through. Each lock raises the ship approximately 28 feet, for a total rise of 85 feet above sea level. Currently the largest ship that is allowed to pass through the locks is called a Panamax; these ships cannot be wider than 106 feet and over 950 feet long and cannot have a draft of more than 39.5 feet. The average minimum water level in each lock is just over 42 feet. Every time a ship passes through a series of locks it uses 26,000,000 gallons of fresh water. Full passage from one side to the other uses just over 53,000,000 gallons of water that is drained from Lake Gatun to the Oceans.

> "We all have done a very good job learning to conserve the water resources that we have. Sometimes I think we may have learned to conserve a little too well.

All of the water used is provided by Lake Gatun, a man made fresh water lake covering just over 164 square miles and holding approximately 183 billion gallons of water. The water level in the lake is maintained by the annual rainfall each year but recent dry seasons are causing concern that there will not be enough water to sustain the usage requirements of the canal each year and still provide the water resources required by the Panamanian people. For this reason new locks are being built next to the existing locks that will incorporate intensive recycling of this natural resource saving up to 60% of the water that is currently being used. The new locks will also be able to accommodate much larger ships.

When I think about the facility where I work at and the 15 million gallons that we treat each day, it seems like a lot of water, especially when I think of the benefit all of this clean water has on the downstream users of the Jordan River. This all pales in comparison to the amount of water that is required to raise one ship from sea level and then lower it again. Just like the people of Panama are concerned about running out of water we too are concerned about water shortages and the impacts it will have on life and the things we enjoy.

We all have done a very good job learning to conserve the water resources that we have. Sometimes I think we may have learned to conserve a little too well. Over my many years in this business I have seen the increases in flows to the facilities not keep up with the growth that is taking place around us. While this is a wonderful thing to have happen we all know that lower flows mean less water to the receiving

streams. Less flow to the waterways means less dilution and therefore more stringent discharge requirements. These stricter requirements mean that the people who operate the many Wastewater facilities in our state need to be the best in the industry. This includes the engineers who design and build treatment plants, to the people who operate them. Also included are the collection's workers who assure that the water gets to us and protects the public from its potential dangers. Our pre-treatment personnel, who monitor the flows to protect the treatment facility, and our managers and laboratory people and everybody else that all make this happen. Because of you we will continue to produce quality effluent water and the waterways around us will continue to stay clean so we all can enjoy them. DN

Spotlight on Dustin J. Walton

By Gordon Evans

About 10 years ago a friend of a friend told Dustin's mother that there was a job opening at the Snyderville Basin WRF and she thought that Dustin should apply for the position. At the time Dustin was working as the General Manager of Einstein's Bagels on University Ave. near the University of Utah. Dustin applied for the job and was hired in June of 2006 as an operator at the East Canyon Treatment Plant. It didn't take long for Dustin to make friends there because of his funny sense of humor and outgoing personality. Since starting at Snyderville Dustin has had to take everything he knew about Bagels and turn it into knowledge of Wastewater. Within the first year Dustin took the grade 1 Wastewater Treatment exam and when he passed it he took the advice of some old dogs that he worked with and kept taking the tests until he passed all four. It only took a few years and Dustin had passed he grade 4 test.

Dustin grew up in Park City, Utah where he attended school and graduated from Park City High School. Getting a job at Snyderville was like going home for him. Snyderville Basin is very active in promoting an awareness of Wastewater and water conservation and hosts numerous tours of its facility's. Dustin has become a very knowledgeable and fun tour guide because of his ability to interact with people. One of his favorite tours was when his High School science teacher Ed Mulick would bring his 10th grade students to the Treatment Plant for their annual tour. Dustin loved to be the tour guide for his Teacher and reconnect with him and share his knowledge and enthusiasm for Wastewater treatment. There were many of these tours that Ed would tell his class that Dustin was a past student of his and what a valuable contribution he was making to the environment and how great a career he has.

Dustin met his lovely wife Emily while he was the manager of Einstein's. After a 10 month courtship he asked her to marry him and the rest is history. Since their marriage they have started their family which consists of two boys and one girl. Jack is the oldest and will be 10 in October. Seth is next and he is six and Heidi is four. Dustin loves his family and especially spending time with his

"Snyderville Basin is very active in promoting an awareness of Wastewater and water conservation and hosts numerous tours of its facility's. Dustin has become a very knowledgeable and fun tour guide because of his ability to interact with people.

children. He is not bashful about telling you that his kids are his best friends especially since he is a big kid himself. He loves to have fun Skiing, golfing, hiking mountain biking and camping. A few years ago one of his co-workers had a pop up trailer that he was selling, so Dustin and Emily bought it and have had a lot of fun spending time away from home in there camper.

While I was talking with Emily about Dustin and what he likes she said that he loves to fix things and putter around the house. She said that he always has to have a project or something going or he is not happy. She asked him why he just can't sit and he said because it makes him happy to be doing something. A few years back Dustin was asking around work if anyone knew how to frame a wall. He was trying to add a laundry room onto their house and was stuck. I talked with him about what he needed to do and one thing led to another and the two of us spent a Saturday building a wall, installing a window, hanging a door, sheeting and weather proofing the addition so they could have a laundry room. It was a fun day for both of us and fun to watch Dustin work and play with Jack. Jack was about three at the time and wanted to be as big as his dad. They pounded nails in scrap wood and swept up the mess and just had a good day. I believe Jack even ate a big boy burger for lunch with us that day.

Dustin is a very competitive individual and loves a challenge. He is also an avid sports fan and loves to watch the Jazz and always cheers for the Utes. This competitive spirit has led him to participate with Snyderville Basin on numerous Operations Challenge teams. His competitive spirit and fun personality have made it fun for his whole team to participate in these events. Through the Operations Challenge Dustin had made many friends at numerous treatment plants. If you do not know him yet, take the time to get to know him. It will be worth the effort. DN

Operations (Challenge) Quiz

By Gordon Evans

You are operating an activated sludge Bio-Reactor process treatment plant. Your facility has dual process trains each containing; 1 Anaerobic Zone with 0.55 MG volume. 1 Anoxic Zone with 0.55 MG volume. 3 Aerobic Zones with 0.74 MG each. The plant is currently seeing an Influent flow of 6.5 MGD with a BOD of 216 mg/L. Process train 1 has a MLSS concentration of 3175 mg/L with a volatile content of 78%. Process train 2 has a MLSS concentration of 2721 mg/L with a volatile content of 76.4%. Wasting at your facility is done to a target mg/L of 2800. The wasting is calculated in total lbs. to be wasted.

1. Calculate the total lbs. to waste from the plant each day. (Assume 7 day a week wasting)
A. 4098 lbs.
B. 2756 lbs
C. 8196 lbs.
D. 6789 lbs

2. There is an imbalance of solids between the two process trains and solids are increasing in train 1. Assuming that the influent flows are evenly split, what is the amount in lbs. that must be wasted from train 1?
A. 4672 lbs.
B. 3524 lbs.
C. 3401 lbs.
D. 2050 lbs.

3. What is the amount in lbs. that must be wasted from train 2?
A. 2050 lbs.
B. 3401 lbs
C. 4672 lbs
D. 3524 lbs.

4. What is the difference in lbs to be wasted between train 1 and train 2?
A. 3524 lbs.
B. 4672 lbs.
C. 2050 lbs.
D. 3401 lbs.

5. Your facility has a target F/M of 0.2. What steps must you take to get to get to the target F/M?
A. Increase the target wasting lbs.
B. Decrease the target wasting lbs.
C. Increase influent BOD
D. Both A and C.

Answers

1. First calculate the total volume of the two ditches.
   [0.55 + 0.55 + (0.74 X 3)] X 2 = 6.64MG
   Find the average MLSS of the process basins.
   (3175mg/L + 2721mg/L) ÷ 2 = 2948mg/L
   Calculate the total lbs. in the system.
   6.64 MG X 2948 mg/L X 8.34 lbs/gal = 163253 lbs.
   Calculate the target lbs. 6.64 MG X 2800 mg/L X 8.34 lbs/gal = 155057 lbs.
   Find the difference in lbs. between the target and the actual lbs.
   163253 lbs. - 155057 lbs. = 8196 lbs.

2. Find the % difference between process basin 1 and 2.
   2721 mg/L ÷ 3176 mg/L = 85.6%
   Subtract 85.6% from 100% to get the multiplier. 100% - 85.6% = 14% or .14
   Divide the total lbs. to waste by 2 and multiply that by the % difference.
   8196 lbs. ÷ 2 = 4098 lbs.
   4098 lbs. X .14 = 574 lbs.
   Add 574 lbs. to 4098 lbs. 574 lbs. + 4098 lbs. = 4672 lbs.
   This is the lbs. to waste from train 1.

3. Subtract 4672 lbs. from the total of 8196 lbs.
   8196 lbs. - 4672lbs. = 3524 lbs. This is the lbs. to waste from train 2.

4. Subtract 1761 lbs. form the total lbs. to get the difference between the two trains.
   8196 lbs. - 3524 lbs. = 4672 lbs.

5. F/M = lbs. food ÷lbs. bugs. First calculate the lbs. of food.
   (It is not necessary to use 8.34 lbs/gal in this calculation).
   6.5 MGD X 216 mg/L BOD = 1404
   Find the volatile content of the MLSS.
   3175 mg/L X 78% = 2477 mg/L
   2721 mg/L X 76.4% = 2079 mg/L
   Find the average. (2477 mg/L + 2079 mg/L) ÷ 2 = 2278 mg/L
   Multiply the basin volume by MLVSS 3.32 MG X 2278 mg/L = 7563
   Divide the BOD by the MLVSS 1404 ÷ 7563 = 0.185 or 0.19
   To increase F/M decrease the microorganisms. Do this by increasing the target lbs. to waste.

Utah's First Professional Operator (PO)!

By Paul Krauth

Congratulations to Lonn Rasmussen for being Utah's first Professional Operator PO!

The Certification Commission for Environmental Professionals (C2EP) of the Association of Boards of Certification (ABC) implements certification programs for water environment industry professionals. C2EP awards certified operators the Professional Operator (PO) designation, the industry's first professional designation for operators.

Professional Operator (PO) is the designation awarded to C2EP-certified water environment industry operators signifying they have met the most rigorous standards of their profession. To earn the PO title, operators must pass the relevant C2EP certification exam and meet specific education and job experience requirements.

C2EP's Professional Operator program offers certification in water treatment, distribution, collection, and wastewater treatment operations. Each of these certification types consists of four classes of certification ranging from Class I to Class IV, with Class IV reflecting the highest level of job complexity and operational requirements.

Lonn Rasmussen has dutifully served ABC's Wastewater Collection Validation and Examination Committee, now known as the Wastewater Collection Scheme Committee, since 2004. He has chaired the committee since 2010. Lonn has also been highly involved with the Water Environment Association of Utah, serving as the association's 2002-2003 President and has received several awards from the organization. Lonn has served the collection system of the Cottonwood Improvement District in Sandy, Utah since 1983 and is currently the Operations Supervisor of the District's collection system. Lonn maintains a Class 4 certification as a Wastewater Collection Operator and also holds an Advanced Safety certificate from the National Safety Council. DN

Let's put a stop to bad brakes

By the Collection Committee

1. **A modern air brake system combines three different systems. They are the service brakes, the parking brakes and the_____ ?**
   A. S-cam brakes.
   B. Drum brakes.
   C. Foot brakes.
   D. Emergency brakes.

2. **Which type of brake is the most common in commercial vehicles?**
   A. Wedge brakes
   B. Disc brakes
   C. S-Cam brakes
   D. Drum brakes

3. **Vehicles with air brakes must have:**
   A. At least two air tanks.
   B. An air pressure gauge to show the pressure available for braking.
   C. An air pressure gauge, to show air used by the brake chambers for braking.
   D. None of the above.

4. **What should you check so that it is solid, clear of objects and securely bolted to the tractor frame?**
   A. Platform
   B. Apron
   C. Kingpin
   D. Catwalk

5. **What should not be bent, damaged, or rusted through and should be evenly centered, with the dual wheels and tires evenly separated?**
   A. Spacers or Budd Spacing
   B. Lug nuts
   C. Rims
   D. All of the above

6. **What do you inspect to make sure all are present, free of cracks and distortions and show no signs of looseness such as rust trails or shiny threads?**
   A. Lug nuts
   B. Spacers
   C. Rims
   D. None of the above

7. **This gauge should come up to normal within seconds after engine is started:**
   A. Air pressure
   B. Oil pressure
   C. Coolant temperature
   D. Blood Pressure

8. **Which does not need to be checked as part of the in cab check?**
   A. Horn
   B. Heater/Defroster
   C. Air conditioner
   D. Wipers/washers

9. **What should be clean and adjusted properly from the inside?**
   A. Windshield
   B. Lug nuts
   C. Mirrors
   D. Headlights

10. **Inspect the emergency equipment to make sure it consists of:**
    A. Charged and rated fire extinguisher
    B. Three red reflective triangles, 6 fuses or 3 liquid burning flares
    C. Spare electrical fuses
    D. All of the above

Questions supplied by *truckercountry.com* web site.

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

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North Davis Makes SHARP Decision

By Curt Simmons, WEAU Safety Committee

Recently North Davis Sewer District (NDSD) has taken the opportunity to partnership with OSHA and participate in the Public Sector Safety and Health Achievement Recognition Program (SHARP).

SHARP was set up to reward public sector employers who operate an exemplary safety and health management system. Acceptance into the Public Sector SHARP program by OSHA is obtained by undergoing a free comprehensive safety and health survey, correcting all hazards identified by the survey, and then being able to sustain an effective health and safety management system in order to keep the SHARP status current. You don't have to be perfect to let OSHA come out to help, however you do have to commit to fixing what they find non-compliant!

Based on our experience at NDSD the team of OSHA consultants were fair, knowledgeable, and very easy to work with. I found myself asking them what they thought of certain aspects of the District safety programs and practices instead of hoping they didn't find anything! Many of the items found to be in non-compliance where of a very simple overlooked nature; items such as parts washer tank lids open when not in use, a missing drill press chuck guard, and in one instance an extension cord running a permanently mounted piece of equipment. Other items discovered were more policy related. Because NDSD is subject to Process Safety Management (PSM) regulations its PSM was audited at the time of the facility inspections. This was where it got interesting. Anyone that has ever been subject to a PSM audit, you know what I'm talking about! The PSM auditor was thorough, but very nice and informative. We had a few bugs in our policy but for the most part we got through it as well.

The SHARP program, though I was very reluctant to commit to, has turned out quite rewarding. Like many of the wastewater facilities around the state, knowing the correct way to implement many of the tasks that we must perform is a daunting challenge. NDSD has been able to use much of the results from the inspection by the OSHA consultation team to develop an even stronger safety program than we had before which was our goal. We started the program in July of 2015 and hopefully will achieve SHARP status in the next month or so. It has been a bit of work, but the end result will be a better safety program and hopefully a safer work place for our employees, and after all, that is what it is really about, our employees, not an award!

If I were asked if I thought that enrolling in this program was worth the extra work, I would have to say yes! We did learn a lot of new things and the OSHA folks have been a great resource for us during the consultation visits and for the future if the need arises. If you have considered OSHA consultation services but are afraid to commit like I was, I would strongly encourage you to make the call and take the opportunity to improve your safety program. dn

UPDATE from the WQTC Conference

By Ken Burgener

Recently I attended the Water Quality Technical Conference (WQTC) in Salt Lake City, UT. This conference highlights many of the problems we are facing around the US and Canada with water and its treatment. No one person or group has all the answers, but we have a lot of problems that need to be addressed. I will only highlight a few over the next year.

Cyanobacteria.

Formerly called blue green algae and still incorrectly used, this bacterial problem continues to grow. "Inland waters across the United States (US) are at potential risk for increased outbreaks of toxic cyanobacteria blooms events resulting from elevated water temperatures and extreme hydrologic events attributable to climate change and increased nutrient loadings associated with intensive agricultural practices."[1] These blooms basically need five factors to be right for uncontrolled growth to occur. These include elevated temperatures, nutrients (nitrogen and phosphorus, etc.), calm water, light and oxygen. If any of these factors are missing an event will not occur or will be greatly diminished.

"We found that cyanobacterial populations have expanded really strongly in many lakes since the advent of industrial fertilizers and rapid urban growth," said Zofia Taranu, a PhD candidate in McGill University's Department of Biology and the study's lead author, in a press release. "While we already knew that cyanobacteria prefer warm and nutrient-rich conditions, our study is also the first to show that the effect of nutrients, such as phosphorus and nitrogen, overwhelm those of global warming."[2]

"Formerly called blue green algae and still incorrectly used, this bacterial problem continues to grow."

"Despite the name, blue-green algae is a type of bacteria (cyanobacteria) that use photosynthesis and forms a blue-green scum on lake and pond surfaces. Blue-green algae blooms can pose a serious threat to humans, animals, and the local environment. Usually appearing during the warmer summer months, the presence of blue-green algae blooms in many places has increasingly been reported throughout the year.

Cyanobacteria can cause water discoloration, reduce light penetration and increase oxygen depletion when they die off. Unlike other types of algae, blue-green algae are not an important part of the food chain because they are generally not consumed by other aquatic organisms.

Cyanobacteria have the ability to produce toxins that are harmful to the liver and nervous system, posing a serious threat to drinking water sources. Even though cyanobacteria blooms do not produce toxins all of the time, when they do, the effects can be severe. Last August, a cyanobacteria bloom in Lake Erie forced the shutdown of the water supply to the city of Toledo, Ohio, for two days.

Common symptoms of acute exposure to harmful blue-green bacteria in humans include skin rash or irritation, gastroenteritis and respiratory distress. Low-dose, chronic exposure over decades may result in endocrine disruption and liver tumors, according to the study authors.

In preliminary studies – which are still controversial among researchers – a recently isolated cyanotoxin that may become concentrated across food chains may be associated with the risk of progressive neurodegenerative diseases like ALS, Parkinson's and Alzheimer's."[2]

"Our work shows that we need to work harder as a society to reduce nutrient discharges to surface waters," said Irene Gregory-Eaves, associate professor at McGill University and co-author of the study. "Because diffuse nutrient loading (as opposed to end-of-pipe effluent) is the main issue, we need to build collaborations to tackle this complex problem. For example, partnerships among freshwater scientists and farmers are starting to happen, and more of this needs to take place, so that we can strike a balance between maximizing crop yields and minimizing excess fertilizer application."[2]

This bacterial problem is a main factor in fish kills and animal deaths in Utah and through the world.

In 2014 two dogs died after swimming in the waters of Utah Lake. They died within hours of exposure to the water and though some tests were initially listed as inconclusive, there now seems to be general agreement that both dogs were poisoned by cyanotoxins. Exposure to cyanotoxins can have an impact on the liver, kidneys, heart and lungs.

"Many fish kills could be prevented by reducing the amount of pollution, especially nitrogen and phosphorus, entering waterways. Applications of fertilizers should be matched to the needs of the crop, sewage effluent should receive advanced treatment, and atmospheric emissions from industry and transport should be carefully controlled at source."[3]

"It's not all doom and gloom, either, said Erica Gaddis, assistant director of watersheds monitoring at the Utah Division of Water Quality.

Some of the reservoirs on the list of vulnerable waters are actually big success stories, she said.

For example, Gaddis said, East Canyon Reservoir, a popular recreation area, used to have trouble with toxic algal blooms, but hasn't had a bloom since 2004, when an upstream waste treatment plant was upgraded.

Deer Creek, which supplies drinking water for the Metropolitan Water District that serves Salt Lake City and Sandy, also used to have problems with algal blooms in the 1980s. They also stopped after similar wastewater treatment upgrades."[4] DN

1 *http://www.sciencedirect.com/science/article/pii/S0034425714002211*
2 *http://www.arbiternews.com/2015/03/01/toxic-algae-proliferating-in-lakes-in-europe-north-america/*
3 *http://www.encyclopedia.com/topic/Fish_kills.aspx*
4 *http://archive.sltrib.com/story.php?ref=/test/testhome/2815139-156/its-not-just-utah-lake-toxic*

Chlorine Gas Disinfection: Total Containment and RMP Studies

By Eric Laurin, P. E., Coe & Van Loo Consultants, Inc. *http://cvlci.com/*

Plant Managers across the country are faced with complex safety requirements in the operation of a water treatment plant. Heightened US Environmental Protection Agency (USEPA) requirements are expected when chlorine gas is used as a disinfectant because chlorine is designated as an Extremely Hazardous Substance (EHS) as defined in 40 CFR Part 355. Certain emergency planning activities known as Risk Management Studies (RMP) are also required by Federal and many State agencies when chlorine is stored above a certain threshold quantity (TQ). Additionally, the method of storing chlorine will influence the scope and extent of the emergency plan preparation that is required by the RPM regulations. This article discusses the impact of total containment on the preparation of Federal RMP Studies. It is recommended that State and local regulations be reviewed when preparing emergency plan preparations for additional requirements.

* The water treatment industry uses two techniques for the control of chlorine leaks. These are scrubbing or containment.
* Scrubbing is a treatment system that neutralizes the accidental release of chlorine gas by drawing contaminated air through a chemical absorption system. The treated air is discharged to the atmosphere.

Containment systems employ a self-contained vessel within which the chlorine gas cylinder is housed. Accidental leaks of chlorine are kept within the containment vessel, an ASME rated pressure tank, for recycling to the injection system at a normal flow rate. No atmospheric venting

El Paso, TX

"It is **strongly recommended** that your state's **TQ requirements for chlorine** be checked when assessing the need to perform an **RMP.**"

is generated because the leaked gas is kept within the containment vessel. TGO Technologies, Inc., of Santa Rosa, California, has developed self-containment vessels for both 150-pound and 1-ton cylinders that perform this function and keep our communities safe. See photo.

Both scrubbing and containment technologies for chlorine gas are subject to the requirement of an RMP, as stipulated in Section 112 (r) of the Clean Air Act and Article 80 of the Uniform Fire Code. In Section 112 (r), the USEPA developed a list of 77 toxic and 63 flammable substances for which TQs were established. The TQ for chlorine is 2,500 pounds.[1] Facilities storing chlorine gas in quantities that equal, or exceed 2,500 pounds are required by statute to prepare an RMP in accordance with 40 CFR Part 68, Subpart G.

It is important for Plant Managers to accurately inventory the quantities of stored chlorine gas cylinders at the plant site. Stored quantities of less than 2,500 pounds do not trigger the preparation of a Federal RMP, an activity that requires significant administrative time and effort which diverts scarce resources from plant operation and system monitoring.

A further consideration when determining whether a facility must prepare an RMP is the method used to control chlorine leaks. A self-contained, total containment vessel of the type available from TGO Technologies, as described above, is considered a separate process if not manifolded or interconnected to other vessels. That is, a single, unconnected 1-ton cylinder housed in a total containment vessel would be below the exempt TQ of 2,500 pounds and an RMP would not be required. Up to sixteen (16) 150-pound gas cylinders may be interconnected and not meet the TQ of 2,500 pounds (i.e. 150x16 = 2,400 pounds). However, the manifolding of a seventeenth 150-pound cylinder triggers the requirement for a Federal RMP. It is recommended that treatment facilities review their gas chlorine system storage and delivery designs to determine if these designs can be modified to separate, currently connected 1-ton cylinders, resulting in a stored quantity of 2,000 pounds, a quantity below the threshold 2,500-pound TQ amount, and thereby avoid the preparation of an RMP.

We have been discussing the specific TQ amounts that trigger the preparation of a Federal RMP as presented in Section 112 (r) of the Clean Air Act. The use and storage of gaseous chlorine triggers other safety and reporting requirements as mandated by the Emergency Planning and Community Right to Know Act (EPCRA), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and others such as OSHA's Section 1910.119[2] that must be prepared by the facility. We also note that State RMP TQs may be more stringent than the federal regulation identified in Section 112 (r); for example, California's TQ for chlorine is only 100 pounds. It is strongly recommended that your state's TQ requirements for chlorine be checked when assessing the need to perform an RMP.

In conclusion, the TQ for conducting a Federal RMP Study for chlorine gas is 2,500 pounds. If a water treatment facility has multiple 1-ton chlorine cylinders, and each is enclosed within a total containment vessel designed to withstand any release of chlorine, and if they are not interconnected, each is considered to be a separate process. This will allow the separate vessels, individually, to be below the exempt quantity of 2,500 pounds, and no RMP Study is required. It should be noted, however, that the use of containment vessels will keep our communities safe regardless of whether a RMP is required.

About the Author:

Mr. Laurin has almost 40 years of consulting engineering experience in designing water systems for private and municipal water providers in 8 states and American Samoa. He is currently Director of Water Resources for CVL Consultants, Inc., a Phoenix, AZ based firm. He will be presenting at the June 2016 AWWA National Conference to be held in Chicago on the regulatory perspectives of gas chlorination.

By D. Jeffrey Wiest

Bill Luce

After an active and dynamic career in civil and environmental engineering, Bill Luce retired four years ago. He was first drawn to civil engineering after seeing a pamphlet on such a career in the library at Trumansburg Central High School (upstate New York) back in January of 1965. Bill still has the pamphlet and plans on returning it (with some kind of "late fee") sometime in the future.

Syracuse University was Bill's first college experience, where after a less than stellar first semester, he transferred to a smaller two year college in the area. After graduation, he and a few friends then decided Utah State would be a great place to finish their Bachelors degrees (enticed by the Utah skiing!). While at Utah State Bill met a young lady (Evelyn Ashcroft) from Cache Valley, joined the LDS church and got married in 1970.

After completing his B.S. degree in 1970, Utah State Professor Norm Jones offered Bill an opportunity to study toward a Masters Degree, and a graduate traineeship in civil and environmental engineering, funded by the EPA. This was near the beginning of the sanitary/environmental engineering program at Utah State University.

The education Bill obtained at Utah State opened the door to a position at Nielsen, Maxwell & Wansgard Engineering, which later merged with James M. Montgomery. He next worked with CH2M Hill for three years. After a move to Vaughn Hansen Associates in 1984, Bill and two fellow employees had an opportunity to buy the firm. Hansen, Allen & Luce was formed in 1987.

When asked about the highlights of his career, Bill responded with the following:

Participating as part of several teams in 201 facility planning of several projects (plants) along the Wasatch Front such as Central Weber, North Davis, South Davis (both plants), Salt Lake City, South Valley, and other facilities in Utah.

Hansen, Allen & Luce developed a system of analysis for determining a maximum allowable number of septic systems (density) in a given area. The approach, which was used in several Utah counties, used a nitrate mass loading analysis to help ensure that ground water quality standards were maintained.

Over Bill's career some of his most enjoyable memories have come from his association with the incredible members of WEAU, and others he came in contact with in his profession. Bill enjoyed relationships developed with operators, managers and regulators, most all of whom he considers as friends. Early in his career he remembers one of these, Jack Peterson, telling a group of graduate students that "One man's [poop] is another man's bread and butter".

While Bill considers himself lucky never to have fallen into a sewer he also recalls not so pleasant (early) memories like spending an entire evening in a giant "big box" manhole in a large diametersewer while participating in an inflow/infiltration study in a prominent Utah city. It was a challenging night, he even remembers that the galvanized pipe "safety rails", supposed to protect personnel from falling into the sewer, were so corroded and thin he could stick his finger right through them.

During a career spanning nearly four decades Bill has enjoyed observing improvements in wastewater treatment technologies, going from strictly secondary to more advanced wastewater treatment including various means of filtration, disinfection, etc. and water reuse. He also observed Federal and State Governments increasingly recognize that higher levels of treatment are essential to the preservation of public health and the environment.

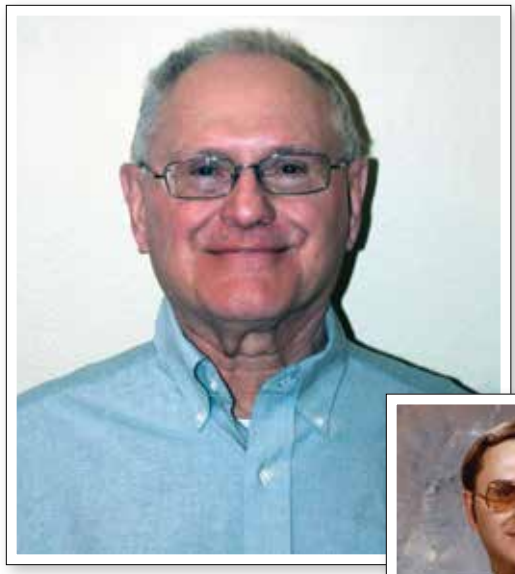
Bill was honored to serve as President and Federation Director of WEAU. He also served as a Member and Chairman of the Utah Water Quality Board, Member of the Utah Drinking Water Board, Member of the Utah Community Impact Board, and Member and Chairman of the Davis County Board of Health. Bill was also honored to receive the "Engineer of the Year 2000" award from the Utah Engineer's Council. He has paid for it ever since however as whenever he makes a mistake, his sons-in-law ask him, "…is that really what the Engineer of the Year would do?"

When asked for advice he would give to young professionals just getting started in the industry Bill stated, "Get all the education you can, work hard, don't take yourself too seriously, and treat other people as you would like to be treated."

Bill and Evelyn have six children and 15 grandchildren. They are enjoying retired life, having just completed an LDS church mission. DN

By D. Jeffrey Wiest

Rex Ausburn



Rex Ausburn says jokingly "retirement is just awful". Not hard to imagine for someone with such a varied and dynamic career as he has enjoyed. All in civil and sanitary engineering right from the beginning. Rex graduated from the University of Missouri (go Tigers!) where his participated in the Air Force ROTC . His four year tour on active duty was served at McClellan Air Force Base, CA from 1970 to 1974 as a civil engineering officer overseeing building remodeling and as a fuel systems engineer.

Out of the Air Force, Rex took a position as a wastewater utility supervisor for the city of Columbia, Missouri. After 5 years he moved to Utah and was employed by PM Engineers, Inc. He became the district engineer at the Snyderville Basin Water Reclamation District (SBWRD) in Park City, Utah. In 1984 Rex was appointed District Manager at SBWRD where he served another 16 years until taking his first retirement at the end of the year 2000. During his time with SBWRD, Rex was involved in more than one upgrade at the East Canyon Treatment Plant, the original construction of the Silver Creek Outfall Sewer and Treatment Plant, installation of a public sewer in Main Street in Park City, plus numerous other sewer system upgrades, pump stations, and system expansions.

After SBWRD, Rex worked for a couple of consulting firms before going to work in the Environmental Department for the Flying J Corporation from 2004 until 2010 when he went back to working as a consulting engineer with Anderson Engineering Company, Inc. He retired from Anderson Engineering in 2014. Rex still consults a little with Broadbent & Associates, Inc. providing O&M oversight support for a couple of PFJ Travel Plaza sites in Utah and Idaho.

Rex is not really sure when his interest in civil engineering started, probably by encouragement from high school teachers. During his career, Rex has most enjoyed the relationships, friendships and professional respect developed with peers in the industry. He has enjoyed public service and most people involved, even though he one time had a young woman threaten to shoot him because the sewer backed up into her basement.

From 1992 through 1997 Rex served as a representative for special service districts on the Utah Water Quality Board which he enjoyed very much. He also worked with the Community Impact Board where his favorite meetings were in the communities with the people applying for and receiving loans or grants from the Board.

As the industry has changed and progressed over the years, Rex has observed improving technologies in wastewater treatment. However, he has been most impressed by the acceleration in professionalism at the operator level in the plants. He remembers from his early years in Missouri, being assigned operators to work at his plants that were waiting for retirement and unable to perform other public works jobs. Now most operators he knows are quite invested in their careers and wanting to grow and improve their skills and associated certifications. These professional operators often improve their level of training and education available through various organizations like WEAU.

Rex remembers working on an Infiltration/Inflow program where he was checking flow in manholes all night long and thinking, "I went to four years of engineering school to end up working in manholes until the sun comes up?" In all his years of working in the industry and climbing in and out of manholes he has never fallen into a sewer, although he has seen co-workers that were not so lucky.

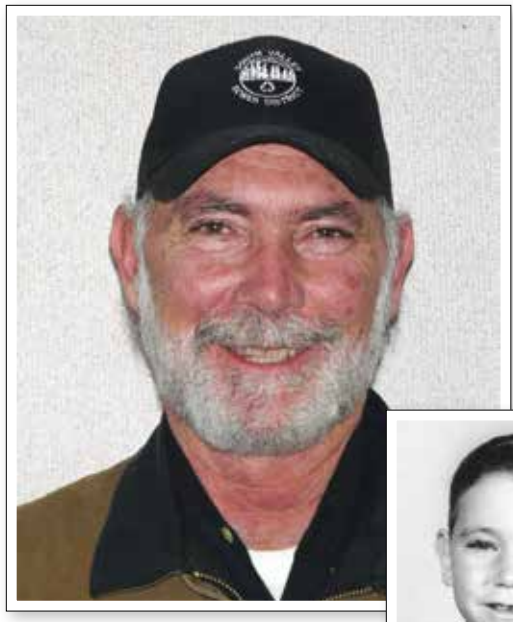
For young professionals just entering the industry, Rex has this advice: Improve math, laboratory and mechanical skills as much as possible, Participate professionally, and don't think of it as sewage, rather dirty water that needs to be cleaned up.

Rex has been married to his wife Bobbi for 41 years. They have two children. Rex says Bobbi involuntarily knows more about wastewater and manholes than she could had imagined when she married him. DN

"For young professionals just entering the industry, Rex has this advice: Improve math, laboratory and mechanical skills as much as possible."

By D. Jeffrey Wiest

Garland Mayne



Garland Mayne has enjoyed a long and rewarding career in the wastewater collections and treatment field spanning 44 years. And he is still working! Currently working for South Valley Service District, serving as the Facility Manager at the Jordan Basin Water Reclamation Facility (JBWRF) in Riverton, UT. The plant is situated literally on the banks of the Jordan River, discharging clean and clear effluent that is of much higher quality, many times in fact, than the receiving stream. The JBWRF is one of the larger "state of the art" BNR membrane bioreactor treatment facilities in the United States.

Garland is a native of Lehi, UT. In 1969 at 19 years old he joined the Army and volunteered for the Special Forces where he served for eight years. He advanced to the rank of Master Sargent E-8. Garland enjoyed the activities of the Special Force such as 110 parachute jumps without injury, open water scuba certification and working with the Navy Seals in Coronado California, mountain climbing, repelling off of cliffs and instructing the Salt Lake City and County Fire Departments to repel and bring injured patients off cliffs.

His first exposure to "dirty water" was as a new hire for the City of Pleasant Grove in 1972, where he ended up at the wastewater treatment plant. Pleasant Grove, American Fork and Lehi cities all owned and operated conventional trickling filter with anaerobic digestion treatment plants at the time. Garland was a quick learner and soon had the facility meeting permit limits.

In 1976 Garland was made superintendent over wastewater treatment and collections in Pleasant Grove. In 1978 the Timpanogos Special Service District (TSSD) was created and Garland was hired as District Manager. The new state of the art regional treatment plant facilitated the closing of the afore mentioned plants, the cities from which, along with Alpine City, made up the member agencies of the new district.

Garland was the district manager at the TSSD for the next 30 years. During his time as manager Garland and the district received 20 prestigious awards and recognitions from various agencies and associations.

From 1977 to 1990 the Utah Water Pollution Control Association (UWPA) recognized Garland with the "William D. Hadfield Award", the "Presidents Plaque", the "Calvin K. Sudweeks Award" and inducted him into the WPCF "Quarter Century Club". During that same time period the UWPA recognized the district for "Outstanding Plant Safety", "Best Plant over 5 MGD" (twice), "Best Operated Plant over 5 MGD" (twice), "Outstanding Pretreatment Program", and "Outstanding Plant over 5 MGD".

The Rural Water Association of Utah (RWAU) awarded the TSSD with "Outstanding Wastewater System" in 1993 and Garland with the "Board of Directors Appreciation Award" 1997.

EPA Region VIII recognized the TSSD with "Excellence Awards" for both the plant and collections system in 1994.

From 1995 to 2003 the TSSD was recognized by the Water Environment Association of Utah (WEAU) as "Outstanding" for Pretreatment (three times), and for their Biosolids Program. Garland received the "Outstanding Supervisor Award" from WEAU in 1998.

Garland served as president of the WEAU in 1982-83 and president of the RWAU from 2001-03. He also served on the RWAU board from 1993 to 2009 in various capacities. 16 years in all!

As an adjunct professor at Utah Valley State College (now University) for 25 years, Garland participated in the development of the environmental degree program, instructing in biological processes, wastewater mathematics, hydraulics, pumps and pumping, and disinfection. Garland enjoys the association with the many students that have now become an important part of the family of waste water professionals.

In 1983 Garland participated in a "Technology Transfer" for 5 weeks at different cities within the Republic of China as a member of the National Environmental Training Association (NETA).

Garland holds Grade IV Certifications for both Wastewater Operator and Collection Systems. He served on the Voluntary Certification Board for 18 years (from 1975 to 1993) and the Mandatory Certification Board for 3 years (1993 To 1996), where he enjoyed the association and friendship with DEQ Director Calvin K. Sudweeks and Professor Grant Borge and many other volunteers to the Board.

Regarding what advice he would offer to young professionals and operators in the industry Garland suggested, "Be a good listener, keep an open ear, but don't be afraid to step up and be heard." Also, "Be patient, changes and advances

are coming". Garland believes the wastewater treatment industry will provide some of the most dynamic career opportunities anywhere in the next several years, with lots of room for growth and advancement.

The TSSD plant was one of the early users of ultraviolet disinfection in the State of Utah. In order to completely eliminate the use of chlorine gas at the plant, an on-site sodium hypochlorite generation system, also a relative new technology at the time, was installed and used to chlorinate the secondary water for plant use. As he now manages a relative large MBR treatment facility, Garland seems to have always been out front when it comes to employing and using new and innovative technologies.

When asked if wastewater treatment is ever discussed around the dinner table at home Garland replied, "Oh yes, frequently". His wife Kristy worked for Horrocks Engineers for many years and she even enjoys the discussions, as according to Garland, "she is my sounding board and anchor".

Garland and wife Kristy have seven children, 21 grandchildren and 10 great-grandchildren. His hobbies include camping, fishing, hunting, horses, rock hounding and other outdoor sports. dn

"Be a good listener, keep an open ear, but don't be afraid to step up and be heard."

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