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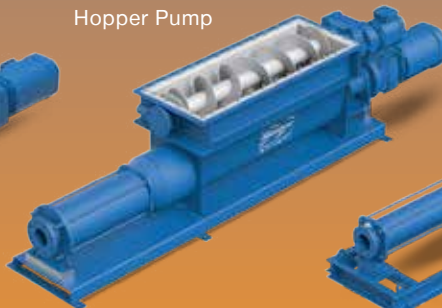
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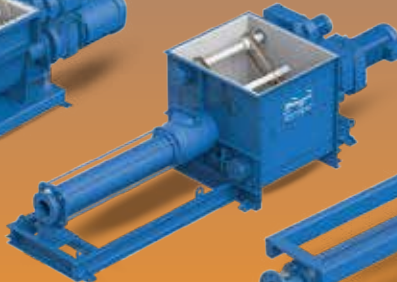
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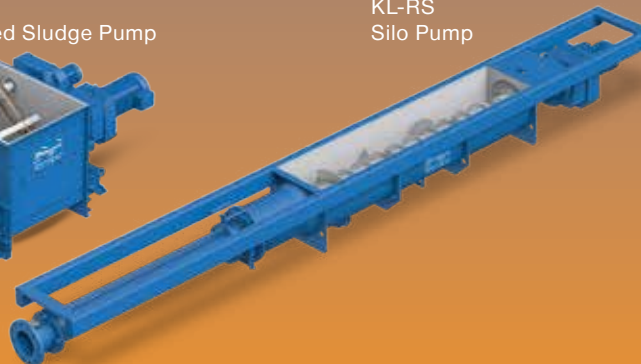
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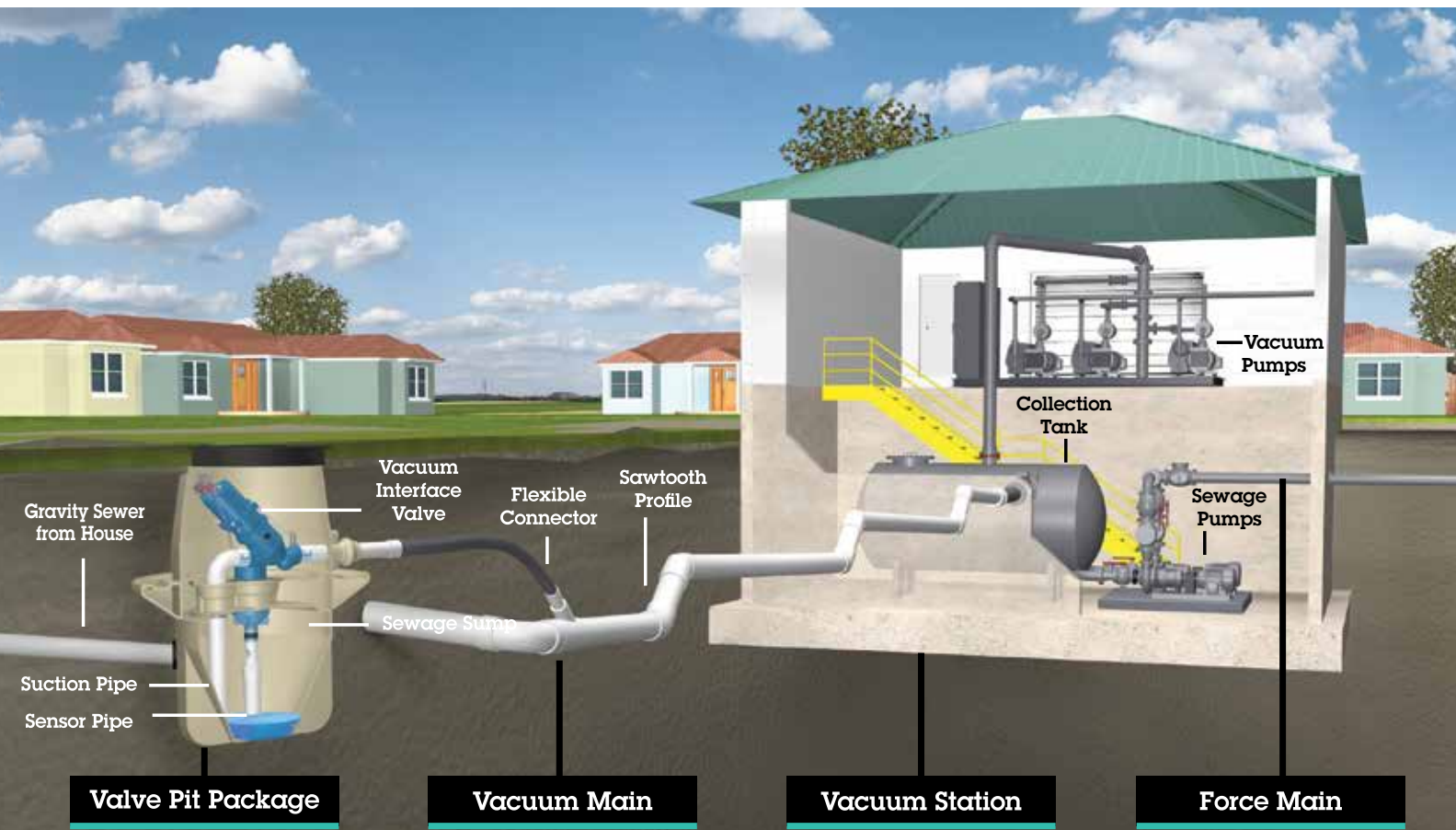


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# Our thoughts go out to all affected by the hurricanes



Clint Rogers

If I ever have to experience a major hurricane, tornado, earthquake, wildfire, or flood, I hope to do so with my WEAU family nearby. Seriously. I had this thought as I was driving after a WEAU event while listening on the radio to the heroics of the first responders in the wake of Hurricane Harvey. Descriptions of police, fire, and other city workers going 30 or more hours non-stop with nothing more than power bars really inspired me. Their dedication towards serving those in need is symbolic of what makes America great. We also see this in the response of the general public with examples such as the Cajun navy (private citizens pulling their boats) arriving

from Louisiana, business owners opening their stores to the displaced, and local donation drives sending both money and semi-trucks of supplies to Houston. I see this same goodness and commitment to rolling up the sleeves when there is work to be done in all of you. WEAU is made up of men and women with the skills, work ethic, and commitment to public service that if tragedy were to strike, and often it does in the form of a clogged line, broken pipe, mechanical failure, or electrical outage, we are in good hands.

Although I write here tonight with the rescue efforts continuing in Houston, Texas, by the time you see these words in print the efforts will have shifted to

restoring critical services like water, sewer, power, and folks trying to get their lives back to normal. Our thoughts and prayers go out to all those affected but especially to our sister organization Water Environment Association of Texas (WEAT) as they work to restore their infrastructure and treatment facilities.

On a lighter note, you are going to notice a change at WEAU. We have a new logo that was developed by the Board of Directors with input from WEF and our Committee Chairs. WEF has undergone a branding effort recently and is making a push for its member associations to develop a logo that does not have their 'wave' as the main feature. We've made

“ WEAU is made up of men and women with the skills, work ethic, and commitment to public service that if tragedy were to strike, and often it does in the form of a clogged line, broken pipe, mechanical failure, or electrical outage, we are in good hands.



this change to our publications, website, and flyers. Versions of the new logo are displayed for reference below, feel free to email me if you need these logos electronically for any WEAU items you are producing. We plan to have some giveaways featuring the new logo at the Mid-Year Conference, mark your calendar for Nov 14.

I want to thank Dave Hatch, Greg Stevens, and Giles Demke for their work on our new website. These guys have really put a lot of effort into improving the way that WEAU shares info via the website and emails info to each of you as members. Part of this upgrade includes additional features that will improve the process of registration for all WEAU events. We hope this is a huge improvement and allows us to better serve you. Not bad for an all-volunteer organization with very minimal reoccurring operating costs.

Lastly, special thanks to Jill Jones who finishes her term as one of our Delegates at WEFTEC. WEAU has two delegates, currently Jill Jones and Lonn Rasmussen, soon to be Lonn Rasmussen and Michael Foerster, who represent WEAU in the WEF House of Delegates. Our delegates keep us informed of news and changes at the WEF level and give voice as our representatives in discussions about WEF policy and direction. Jill has given many years of service to WEAU and I'm sure will continue to be one of our biggest supporters. She is always in attendance at WEAU meetings with a smile, and quick to speak up in support of any ideas that benefit operators. However, if you are providing lunch you'd better have good dessert options or you're going to hear about it from Jill. Thanks for your many years of service to WEAU.

Good luck to our THREE Ops Challenge teams at WEFTEC! [DN](#)



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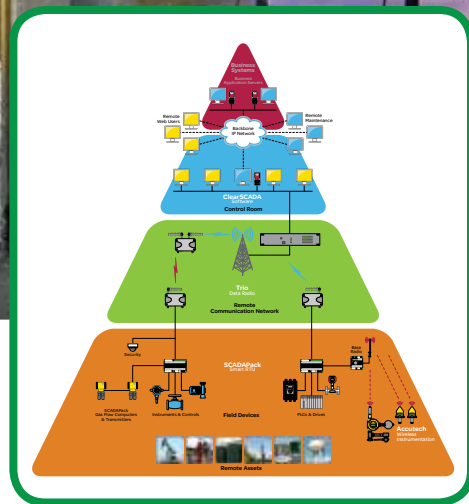
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# Power of Water

Chad Burrell

**A**s I was reading through the WEAU President's Message I am reminded of the Power of Water. This Power is evident in many facets of our lives and areas on the earth. It's very overwhelming to consider the destructive Power of Water and feeling powerless against it in a disaster setting such as a hurricane. This is very humbling; my heart goes out to the victims and I take a moment to reflect. Where else do we see the Power of Water? In my younger years, I spent a lot of time in Bryce Canyon and grew to love the beauty of that area that water has played a very important part in forming and continues forming. Earlier this year my family visited Wind Cave in South Dakota, it's hard to believe that over 140 miles of cave exist below 1 square

mile of area, and once again, water played a part in its formation. We can look around the world at the extremes between desert landscapes that receive little to no water, to snowy peaks that are covered in a continual layer of ice and snow. Somewhere in the middle of these two extremes we live out our lives completely dependent on water for our existence. And once again this reminds me of the Power of Water. WEF recently created a video that asks the question, "What legacy are you creating?" <https://www.youtube.com/watch?v=SroBLDjuiSE>  
This video highlights the importance of water. I would invite you all to watch this video and contemplate the value of what each of us does in this industry, and consider once again the Power of Water. 



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# Operator Spotlight Q&A with Thomas Anderson

(North Davis Sewer District)

**Tell us a little about yourself.**

I'm from Syracuse, UT. I graduated from Clearfield High where I met my wife. I went to Utah State University to study Civil Engineering. After getting married, I went back to Weber State University and received a bachelor's degree in Construction Management. I have a grade IV wastewater operation and collections certification and a grade III maintenance tech certification. I enjoy traveling, camping and riding ATV's with my family. I married my beautiful wife in 2009 and we have two daughters, Olivia and Riley. My wife, Lindsay, works for Wells Fargo. Olivia loves to dance and Riley loves Paw Patrol.

**What drew you to NDS (North Davis Sewer District) originally?**

Originally I started working at North Davis eight years ago when the construction industry pummeled and I was out of a job. At the time I was going back to school and was about to get married and I needed a job. I am grateful for the opportunity North Davis gave me.

**And how has NDS changed since?**

Since gaining employment at North Davis, the company culture has changed. Employees take more pride in their work and are more apt to help each other.

**What is your role at NDS?**

I am currently employed as an apprentice electrician.

**What has been your favorite project at NDS?**

My favorite project that I have been a part of is aiding in the transition to a paperless workplace and using iPads to do the majority of our paperwork, operation, and education.

**What have you gained most from working at NDS?**

Besides the 30 lbs. I've gained since working at North Davis, the friendships I have gained are what I appreciate most.

**What is your favorite part about working for NDS?**

My favorite part at working at North Davis is the different challenges that present themselves. There is always something new to troubleshoot.



**What is your proudest moment at NDS?**

My proudest moment at NDS is when I was given the opportunity to move to maintenance.

**Do you have an office nickname? What is it?**

North Davis has plenty of nicknames for each other, but the most appropriate one for me is "Fluffy."

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**What advice would you give to recent new hires?**

To anyone entering the wastewater field I would recommend learning the math well. It will help you pass certification tests, do well in Operators Challenge, help understand process control data, and become someone the facility can rely on to make adjustments.

**What are three career lessons you've learned thus far?**

The first career lesson I learned is to not judge a book by its cover.

The second lesson I have learned at North Davis: post-secondary education is great and will create great opportunities in your career path, but it cannot replace work place experience.

The third lesson is listening to coworkers that have been around awhile. Most of the tenured employees are willing to share their knowledge and education.

**When did you first compete in the operations challenge?**

I first competed in operators challenge in 2009.

**What has competing in the operations challenge done for you and your career?**

Competing in Operators Challenge has helped my career immensely. It has allowed me to build my network of colleagues and have made great friends because of it.

**How many times have you won locally and how many times have you gone to nationals?**

North Davis has won locally four times



while I was a part of the team, and I have been to nationals five times. Twice to Chicago and Three times to New Orleans.

**What is your favorite memory about the operations challenge?**

My favorite memory from operators was winning the Process Control Event in 2015.

**Three words to best describe you:**

Understanding, devoted, and cheerful.

**Tell us something about yourself that would surprise us.**

I was a State Sterling Scholar Finalist my senior year.

**Top three life highlights?**

My top three life highlights are: marrying my wife, graduating college, and watching my daughters grow up.

I first met Tom a couple years back in the operations challenge competition.

Over the years, I have noticed one thing about him that has never changed and that is his wiliness to help others, not only on his team but any one that needs it. Tom and his teammates are always the first to shake your hand and wish you luck. Win or lose they always stand and cheer for all the other teams.

It has been an honor competing and getting to know more about you. **DT**



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# Getting Involved With the WEAU

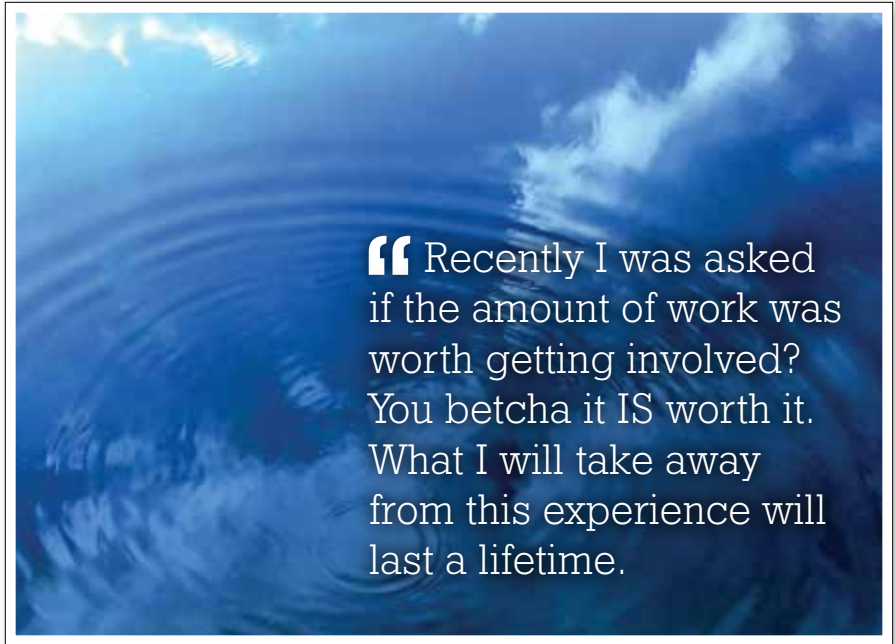
By Rob Jaterka, PWO Rep WEAU

**G**etting involved with the WEAU is a question I was confronted with a couple of years ago. When I was first approached with running for the PWO Rep, I was not quite sure this was something I wanted to undertake. After pondering on this matter for about oh a minute I jumped at the chance. After gaining this position reality set in. I was told about the amount of work that would go into such a role, but no one could really prepare me for what was ahead. Now don't get me wrong I have zero regrets for doing this, it has been one of the greatest experiences of my life.

Being a member of Magna's collections crew I have been a little lost in some of the undertakings of planning trainings for plant operators. But I am here to tell you there are a vast pool of knowledgeable and helpful people in this organization. Until I got involved with the WEAU I really had no idea our industry was so large. From operators to engineers, consultants and managers of other facilities I have meet so many great and interesting people.

My first involvement with this organization was when Magna started having a team in the Operators Challenge. This really opened up many doors for the guys at Magna to start networking and meet other people who do the same type of work. In my opinion the ops challenge is the greatest avenue for operators to meet others in our field of work. Where else can you get together with people from other plants and have some friendly competition?

Recently I was asked if the amount of work was worth getting involved? You betcha it IS worth it. What I will take away from this experience will last a lifetime. My daughter recently ran for and secured a position in our local FFA chapter and she now sees the benefits of getting involved. I hope everyone of you someday gets the chance to understand what I am talking about. The only bad part of my position is it is going to end. I have truly enjoyed the people I have interacted with and look forward to the next chapter whatever it may be. [DN](#)



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# Fall 2017 Quiz

By Rob Jaterka, PWO Rep Elect

1. **What is the most notable difference between primary and secondary clarifiers?**
  - A. F:M ratio
  - B. The equipment used to remove settled solids
  - C. Size
  - D. Type of effluent air
  
2. **What affects the rate of sludge digestion?**
  - A. Temperature
  - B. Mixing or recirculation
  - C. Manner of feeding raw sludge
  - D. All of the above
  
3. **Waste material which comes from animal or vegetable sources**
  - A. Aliquot
  - B. Organic
  - C. Anaerobic
  - D. Aerobic
  
4. **What is the percent BOD5 removal of the plant if the raw influent BOD5 value is 245 mg/l and the final effluent BOD5 is 22?**
  - A. 91%
  - B. 86%
  - C. 9%
  - D. 35%
  
5. **Calculate the water horsepower for a pump delivering 875 GPM against 118 feet of head.**
  - A. 101 HP
  - B. 55 HP
  - C. 7 HP
  - D. 26 HP
  
6. **You used 112 lbs of chlorine in a 24 hour period. Your plant flow was 1389 gpm. What are you dosing at?**
  - A. 3.8 mg/l
  - B. 2.0 mg/l
  - C. 6.7 mg/l
  - D. 3.3 mg/l

ANSWERS: 1. C 2. D 3. B 4. A 5. D 6. C



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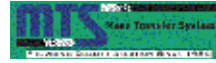
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1. **A commercial motor vehicle (CMV) is any motor vehicle in excess of 10,000 lb. Gross Vehicle Weight (GVW) used in commerce.**  
True or False
2. **Only those CMV's in excess of 26,000 lb. GMVW are required to display a USDOT number.**  
True or False
3. **A CDL is required when driving any commercial vehicle.**  
True or False
4. **A medical card is always good for 2 years from the date of issue.**  
True or False
5. **Steering axle tires must have at least \_\_\_\_ tread depth and rear axle tires must have \_\_\_\_ tread depth. Choose two answers.**  
A. 1/32  
B. 2/32  
C. 3/32  
D. 4/32
6. **It is the responsibility of the CDL driver to assure the co-driver or passenger(s) are using their seat belt.**  
True or False
7. **A CMV driver is allowed to hold/talk on a cell phone as long as he/she does not press more than one button to answer or end the call.**  
True or False
8. **How often are you required to inspect your CMV?**  
A. Daily  
B. Weekly  
C. Each trip if you are assigned to one vehicle  
D. Monthly
9. **What is the allowable blood alcohol level while operating a CMV?**  
A. 0.08  
B. 0.04  
C. 0.02  
D. 0.00
10. **It is required to have a tanker endorsement on your CDL license to drive a combination cleaning and vacuum truck.**  
True or False

**ANSWERS:**

1. T 2. F 3. F 4. F 5. D & B 6. T 7. F 8. A 9. D 10. T

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# Protect Your Data: Handle Split Samples Carefully

Brett Nelson

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

The following is a report on the Region 8 Conference that was held in the beautiful Black Hills of Deadwood, South Dakota this year. First and foremost, my hat is off to the honorable Spencer Parkinson and the dedication that his committee put forth to make this training happen. It was definitely a success in all aspects. There was a great deal of networking as well. Businesses can provide additional data to your County or District's Industrial Waste Program for use in determining compliance with regulations. Businesses can ask for a portion (or "split sample") of your samples to perform their own analysis. Your County or District will average the business's data with your own data. But, the business's data must be valid.

Protect your data using proper procedures for storing, handling, and transferring samples. Failing to do so could result in costly testing and invalid data. Businesses are responsible for following approved methods for handling the sample and conducting the analysis on split samples.

Store, deliver and analyze your samples within EPA-approved protocols and time frames. The procedures vary depending on type of sample and the container

used. The sealed containers you use for split samples may require different handling procedures than the containers businesses use for self-monitoring. Discuss options with your laboratory.

Use "chain of custody" (COC) procedures through all the stages of collection and analysis. You would then provide a COC form with a split sample. You and the business's representative enter their information in the signatory blocks. The original page is kept by you and the duplicate is given to the business for their records. In 2015, the COC form will include a third signatory block for businesses to use when transferring custody of the sample to an analytical lab.

Protect the integrity of your sample sealed with custody tape. You should seal split samples. If there is any evidence of tampering with the tape, the analytical results will be invalid. We have invalidated data from split samples in the past because

companies did not use approved testing methods and/or failed to follow chain of custody procedures. When a company's data are not valid, Counties or Districts use its own data to determine compliance.

As we approach fall I look forward to the leaves changing and the nip in the air

and of course the elk bugling, Spencer snoring more etc.... We should all consider those in the Texas Houston area in their time of need from Hurricane Harvey... Our thoughts and prayers are with them for a fast recovery and safe path to the future. [DM](#)



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# New(er) OSHA Matters

Kirk Freeman, Safety Specialist, Salt Lake City Water Reclamation Facility

The introduction of new OSHA regulations is rare, impactful, and potentially disruptive to employers. While “phase-in” requirements generally cater to a long lead time (presumably to allow affected employers to plan and execute compliance activities), a shift in enforcement or training emphasis to a substance, process, or facility

or program review with the weight of enforcement to follow is indicative of an industry exposure of concern, and certainly sufficient for responsible employers to pay attention to new(er) OSHA regulations.

In 2016, OSHA finalized employer requirements for training in the area of Walking/Work Surface regulations

under the 29 CFR 1910 requirements for General Industry. A relatively comprehensive amalgamation of worksite access facility requirements, it blends some requirements for fixed ladder, portable ladder, fall protection, and work platform that were variously regulated. In addition, under the 29 CFR 1926 Construction Safety regulations, new employer requirements for protection of workers from airborne concentrations of respirable crystalline silica were introduced, and include the specification by each employer to compose and maintain a written Silica Exposure Control Program. (See OSHA guidance materials: 29 CFR 1910.22 and 29 CFR 1926.1153.)

In particular, a requirement for worker training by May 17 of 2017 in the matter of Walking/Work Surfaces can assist a programmatic review of hazards, personal protection equipment, and fall control measures. This initial training is a requirement of most OSHA General Industry standards, and will include employer requirements to provide a written evaluation of slip, trip, and fall hazards, to provide personal protective equipment, and to conduct regular inspection and maintenance procedures as well as systematic and regular training.

Additionally, the Construction Safety standard addressing silica exposure mandates the employer describe the means, materials, training, and labeling for the use of crystalline silica construction or demolition activities, and must include elements of the hazard communication standard that deal with health hazards of airborne silica, including cancer, pulmonary, renal, and immune system effects, and reasonably requires an employer or subcontractor to mitigate worker exposures. An examination of the intensity (when, where, how, and affected employee designation) of demolition and construction activities while using silica-containing materials, and specification of water addition to control emanation of silica dusts for a variety of activities might preclude the employer’s requirement for exposure monitoring, respiratory protection and initial demonstration that a numerical Action Level is unlikely to be exceeded by task-specific instruction. **ENR**



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### REGISTRATION

Please complete registration before November 3, 2017 for the best rates. Registration information is available at [www.weau.org](http://www.weau.org). A continental breakfast and lunch are provided as part of the registration.

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## CONFERENCE SCHEDULE

TIME	EVENT
8:00-8:30	Registration and Continental Breakfast
8:30-10:00	<b>Morning Sessions</b>
10:00-10:20	Break
10:20-11:50	<b>Late Morning Sessions</b>
12:00-1:20	Lunch and Keynote Speaker
1:30-3:00	<b>Afternoon Sessions</b>
3:00-3:20	Break
3:20-4:00	<b>Late Afternoon Sessions</b>
4:00	Return Lanyards and Prize Drawing

## PRELIMINARY TECHNICAL SESSION LISTING

NUTRIENT REMOVAL	WASTEWATER FACILITY PLANNING	OPERATIONS	COLLECTIONS
<b>Pilot Testing Nutrient Removal at Central Valley WRF</b> (Bryan Mansell - Brown and Caldwell)	<b>Turbo Blowers: Real Cost Savings or Just Hot Air?</b> (Peter Zemke - Brown and Caldwell)	<b>Pumping System Operating Efficiency vs. Energy Efficiency in Relation to Impeller Designs and Ragging</b> (Ron Aceto - Cornell Pump Company)	<b>Sustainability of PVC (Vinyl) Pipe: A Comprehensive Environmental Review of PVC Pipe</b> (Kyle Wroblewski - Uni-Bell)
<b>Taking Advantage of Process Intensification for Nutrient Treatment</b> (Tanja Rauch-Williams - Carollo Engineers)	<b>BIOSOLIDS MANAGEMENT</b>	<b>NPSH and Cavitation</b> (Ron Aceto - Cornell Pump Company)	<b>How to Permit Your Next Sewer Project</b> (Kara Cash - Brown and Caldwell)
	<b>Organics Management and Energy Recovery: The Future of Solids Processing</b> Rashi Gupta - Carollo Engineers)		
<b>Rare Earth Technology for Phosphorus Removal and Enhanced Sludge Properties</b> (Jim Gallmann - Neo Chemicals and Oxides)	<b>The Challenges of Implementing BNR - A Real World Example</b> (Chris Mountenay - Stantec Consulting)	<b>Spreadsheets and Graphs</b> (Weston Youd - South Valley Sewer District)	<b>Collection System Rehabilitation - Sliplining Case Studies</b> (Mike Kobe - Brown and Caldwell)
<b>Analysis of Startup and Long Term Performance of a High Output Deammonification System</b> (Mudit Gangal - Ovivo Water)	<b>WATER REUSE</b>	<b>CVWRF's BNR Pilot Plant: The Mechanics that Built it and the Operators Operating it</b> (Jared O'brien - Central Valley Water Reclamation Facility)	<b>Sewer Lift Station Alternatives</b> (Gary Vance - JUB)
	<b>The Right Water for the Right Purpose</b> (Cory Dow - Carollo Engineers)		
<b>Biological Nutrient Removal Applications for Monitoring Oxidation Reduction Potential</b> (Robert Smith - YSI/Xylem)	<b>HAB</b>	<b>Which Level Measurement Technology Should I Choose?</b> (Scott Lee - Siemens Process Instrumentation)	<b>Web Based GIS Management for Collection Systems</b> (Darren Stone, Karl Faulkner - Mt. Olympus Improvement District)
	<b>The Strange Relationship of Cyanobacteria and Protists: A Possible Solution for Some Harmful Algae</b> (Ken Burgener - North Davis Sewer District)		
<b>DWQ's Utah Lake Study: A Framework for Effective Stakeholder Involvement</b> (Carl Adams - Utah Division of Water Quality)	<b>Utah's Response to Harmful Algal Blooms</b> (Ben Holcomb - Utah Division of Water Quality)	<b>Progressive Cavity Metering Pumps Allow Users to Optimize Chemical Consumption While Improving Process Control</b> (Kevin Thomas - SEEPEX)	<b>Why We Clean and Televiser Sewer Pipelines</b> (Sheldon Teeples - RS Tech Services)
<b>DWQ TBPEL Variance Applications</b> (Ken Hoffman - Utah Division of Water Quality)	<b>STUDENT PRESENTATION</b>	<b>SVSD Flow Metering Systems</b> (Mike Foerster - South Valley Sewer District)	<b>I&amp;I and Multi-Sensor Sewer Inspections</b> (Doug Jenkins - CH2M)
	<b>Scholarship Winner</b>		

The content of the technical program is subject to change. Check [www.weau.org](http://www.weau.org) for updates and schedule.

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## CALL FOR ABSTRACTS!

The Annual Conference Committee is accepting abstracts for presentation at the 2018 WEAU Annual Conference. All topics related to water quality, collection, treatment, compliance, utility management, or other related topics will be considered.

Submit abstracts online at [www.weau.org](http://www.weau.org). Abstracts will be reviewed and you will be notified if your presentation is accepted. The presentations will be made to attendees at the conference and formal paper submissions are not required.

**Deadline:**  
**November 22, 2017**



Patrick Dube, Ph.D.

# Accelerating resource recovery

## Biosolids can be used to create valuable products at water resource recovery facilities

Biosolids produced during wastewater treatment commonly are land applied. While this method is a great option to provide an excellent fertilizer that helps promote healthy soils, biosolids also hold much potential to help mitigate climate change, foster sustainability, and achieve zero waste. Resource recovery from biosolids represents an exciting opportunity and potentially can provide additional value while promoting meaningful change.

Utilities hoping to recover resources face questions and roadblocks when seeking the best decisions for their communities. Policies and regulations vary among states and the national level and may hinder recovering resources from biosolids. Likewise, many current resource recovery technologies are not yet established and present more risk than utilities are accustomed to. And lastly, communicating the value of a product derived from biosolids to the public can be challenging.

But solutions exist and others have already blazed many of these trails. To help utilities overcome these challenges and to promote recovering resources from biosolids, WEF has updated the 2013 publication, *Enabling the Future: Advancing Resource Recovery from Biosolids*.

The 2017 update, released in April, is titled *Accelerating Resource Recovery: Biosolids Innovations and Opportunities* (<https://www.e-wef.org/Default.aspx?TabID=251&productId=58093345> or <http://bit.ly/2017-biosolids-rr>). This guide aims to help promote biosolids as a valuable resource to help meet renewable energy needs, promote innovative technologies, and accelerate resource recovery.

### Energy recovery

The energy contained in wastewater and biosolids is five times the amount of energy needed to treat it; this means that water resource recovery facilities (WRRFs) are potential energy generators. The latent energy in wastewater solids combined with energy management and conservation in the facility offers an excellent opportunity for WRRFs to save money by producing energy on site to offset facility costs.

Anaerobic digestion is a long-established technology that can turn solids to energy by converting digested sludge to biogas via microorganisms. The process has many different designs and can be varied by adjusting temperature, implementing a pretreatment step, co-digesting the solids with other wastes and more. The generated biogas has an excellent energy potential and can be burned for electricity or upgraded to other fuels.

On the other hand, thermal conversion is a developing technology that uses heat to generate energy from biosolids. While thermal conversion has a higher energy output potential than anaerobic digestion, it requires more energy to remove the



moisture from the solids, resulting in a lower net energy recovery. New technologies in development are looking to incorporate thermal conversion with higher moisture solids. This combination, it is hoped, would reduce energy costs and derive a higher energy potential.

### Nutrient recovery

Currently, most agricultural nutrients — specifically, nitrogen (N) and phosphorus (P) — come from non-renewable, energy intensive sources. Yet at WRRFs, utilities remove these nutrients from wastewater to meet discharge limits. The utilities face high resource and energy costs to remove them as well as a waste stream that must be disposed of. Herein lies an opportunity to recover instead of remove these nutrients. The result would be a renewable, valuable product that can help offset costs and generate money for the utility.

“Recovering resources from biosolids represents an exciting opportunity for utilities to promote the beneficial use of biosolids while generating valuable consumer products. It begins at utilities, where professional development and skills must be developed and fostered. With this knowledge, biosolids programs can thrive and increase the quality of their products for consumers.”

To recover nutrients, N and P first must be concentrated either biologically (using microorganisms to accumulate N and P), physically (implementing a process like adsorption or ion exchange), or chemically (using a metal salt addition to precipitate out P). The concentrated nutrients then are released (typically biologically) before being extracted.

One example of a potential recovered product is struvite (magnesium ammonium phosphate). Struvite is generated by controlling pH and then adding a chemical precipitant. The process removes high concentrations of N and P and generates a product that can be sold as a commercial fertilizer.

Each nutrient removal method has positives and negatives. And each utility must determine how economically feasible each technology would be for their utility to adopt these systems.

#### Potential roadblocks

Though the potential rewards of resource recovery are great, so are the challenges. Regulations and policies have the potential to help or hinder biosolids resource recovery. Some, federal regulations, such as the 40 *CFR* Part 503 biosolids rule, have helped outline the importance of biosolids and set in place incentives for their beneficial use. On the other hand, regulations also can hinder. Examples include limiting where biosolids can potentially be applied (USDA Code 590) or changing the Renewable Fuel Standard (RFS) and lowering the value of renewable identification numbers (RIN) for biogas.

Likewise, state regulations and policies help or hinder. Elements of solids handling such as odors, phosphorus content, and co-digestion all can be specific to states, and, therefore, regulated differently — both positively and negatively.

One of the best ways to ensure that regulations and policies help biosolids usage is to have interagency cooperation to help address issues. This could mean joining voluntary programs to promote biosolids, such as the National Biosolids Partnership (NBP) or pollution prevention programs, and encouraging research into topics that could become issues in the future.

New and innovative technologies are needed to enhance resource recovery from biosolids. There are many promising


companies attempting to generate valuable products from biosolids and wastewater. These products include fertilizers, biodegradable plastics, and biofuels; but many are still in their infancy. Not only does the high moisture content make it difficult to develop an economically viable technology, but the variable nature of the solids means a universal technology isn't possible; each utility must find its own solution.

Research into a typical utility's efficiency, cost, energy balance, and recovered product is nonexistent; this means each utility must do this on its own. This increases costs and makes the barrier to entry higher. The Water Environment Federation (Alexandria, Va.) and Water Environment & Research Foundation have developed the Leaders Innovation Forum for Technology (LIFT) program to help fill this gap. LIFT promotes research into resource recovery technologies, creates a clearinghouse of information, and takes some of the risk away. But there are more hurdles to leap to bring these solutions to market.

#### Looking to the future

Recovering resources from biosolids represents an exciting opportunity for utilities to promote the beneficial use of biosolids while generating valuable consumer products. It begins at utilities, where professional development and skills must be developed and fostered. With this knowledge, biosolids programs can thrive and increase the quality of their products for consumers.

Effective communication with consumers is paramount. When they understand the benefits of biosolids, they will rightfully translate that into a better perception of the products. A commitment to research and development is key to develop technologies that can expand the resource recovery of biosolids.

**Patrick Dube, Ph.D.** is the Biosolids Program Manager in the Water Science & Engineering Center at the Water Environment Federation (Alexandria, VA). He manages the Residuals & Biosolids and the Air Quality & Odors Control Committees. He can be contacted at [PDube@wef.org](mailto:PDube@wef.org). 



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Kelsey Beveridge

# Achieving energy neutrality through co-digestion

Water Environment & Reuse Foundation research provides both information and examples of successful energy recovery

Many in the water sector are striving to make water resource recovery facilities (WRRFs) be energy self-sufficient. Achieving this goal will reduce both waste and costs. To help foster this, the Water Environment & Reuse Foundation (WE&RF; Alexandria, Va.) has conducted many research projects that examine ways utilities can recover energy and reach energy neutrality. Combining waste treatment with renewable energy recovery provides benefits that such conventional practices as fossil fuel utilization and landfilling cannot offer.

This collection of WE&RF research highlights programs at WRRFs that support energy recovered from wastewater as a renewable energy source. The projects highlighted below are intended for facilities practicing (or planning to practice) several different processes, including co-digestion; incineration; and energy recovery and food waste management through anaerobic digestion (co-digestion). The WRRFs and other agencies examined in these projects provide valuable information that others can learn from and incorporate into their own practice to reach their sustainability goals.

## Co-Digestion of Organic Waste Addressing Operational Side Effects (ENER9C13)

WE&RF initiated a series of complementary studies to better expand the science and understanding of the best practices to advance co-digestion as an option for increased energy recovery. This first project is one in a collection of research intended to advance anaerobic digestion to enhance renewable energy.

The ENER9C13 study evaluated five WRRFs in New York, Texas, and California for co-digestion design, performance data, and operation and maintenance issues.

The findings indicate that digestion of fats, oils, and grease (FOG), food waste, and other organic wastes can increase a WRRF's energy production. As the facilities studied were early adopters of this process, the findings highlighted challenges they faced and the steps they took to address them.

In addition, the WRRFs interviewed identified their best management practices for co-digestion systems. These practices may be beneficial to other facilities beginning their co-digestion programs. First, they recognized that consistent record keeping is crucial for operational decision making and identifying potential problems with accepting these wastes. Second, they recommended screening hauled wastes and creating a permit system for haulers who take measures to improve source control. Third, they recommended scheduling deliveries when WRRF staff members are present for unloading. Lastly, these facilities found that monitoring digester gas production requires better process control parameters than volatile solids destruction, which can be relied upon in anaerobic digestion of wastewater solids alone.

## Energy Recovery from Thermal Oxidation of Wastewater Solids: State-of-Science Review (ENER13T14)

The research team on ENER13T14 performed a state-of-the-science review to evaluate the potential for energy and heat recovery from thermal oxidation of wastewater solids. They compared

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the value of the energy with that of coal in a triple bottom line approach and estimated the quantity of renewable energy available from thermal oxidation of wastewater solids.

The goal was help WRRF managers identify how much energy could be recovered through implementing energy recovery projects and the potential for these projects helping facilities meet sustainability objectives. The research team developed seven scenarios to represent thermal oxidation (incinerator) system configurations. These scenarios identified potential energy recoverable from wastewater solids and residuals. Scenarios included co-firing wastewater solids with such alternative feedstocks as FOGs and woodchips to evaluate the potential for increased energy production.

The energy recovery in each of the seven scenarios produced more electricity than the solids process required to operate. This proves that energy recovery from thermal oxidation, theoretically, can make solids processing a net energy provider for WRRFs. The process is sustainable when compared to fossil fuel power generation; and existing and emerging thermal oxidation technologies provide reliable, effective, and flexible systems for implementing energy recovery.

#### Renewable Energy Production from DoD Installation Solids Wastes by Anaerobic Digestion (ENER14R14)

Department of Defense (DoD) institutions, such as the Air Force Academy, produce large quantities of food waste and consume large quantities of energy. This study demonstrated demonstrates that the energy in food waste, if recovered, can supply 60% of the energy requirements for such DoD installations worldwide and help meet the DoD sustainability goals. Ultimately, the project demonstrated that anaerobic digestion is successful as a means of treating food waste

and producing renewable energy to partially offset an installation's energy demands while reducing waste disposal. Biogas generated by the digestion process can be used without further treatment to generate energy. To further maximize energy production, the biogas can be purified to biomethane as a natural gas substitute.

The results revealed that that anaerobically digesting this food waste meets or exceeds performance objectives; moreover, the practice is cost-competitive with alternative methods of food waste management. Using anaerobic digestion to dispose of food waste while recovering energy also represents a significant greenhouse gas savings compared to landfills or composting. The produced biogas can be sent to a combined heat and power generator to produce electrical power that can be used to reduce facility power costs. The ultimate end use of the biogas or biomethane had a significant impact on cost-effectiveness.

#### Learning from WE&RF's research

Overall, the goal for these projects and others in WE&RF's portfolio is to help WRRFs and other agencies become energy neutral and reduce the demand for purchased electricity or natural gas. The information obtained and insights derived can help to show how different energy recovery methods can be incorporated. Even more so, however, exploring real-life applications can encourage decision-makers to use new technologies to help their operations long-term

**Kelsey Beveridge** is the technical writer in the Communications Department at the Water Environment & Reuse Foundation (Alexandria, Va.). She holds a Bachelor of Arts in Environmental Studies from Franklin & Marshall College (Lancaster, Pa.). [D1](#)



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# PREFERENCE FOR Chlorine Gas for Disinfection

## Supported by Gas Leak Containment Vessels

By Cliff Lebowitz

The superintendent of an average 4 million gallon per day (MGD) activated sludge wastewater treatment plant (WWTP) reports that his or her preference for using chlorine gas as the most cost-effective option for primary disinfection has been further supported by enhanced management of gas leak risk.

“We are operating 24/7 within 200-300 yards of residences, as well as a youth baseball complex,” noted Wayne Lee, superintendent of the wastewater plant in Slidell, Louisiana, “and we also have a high regard for the safety of our employees. We haven’t had any serious gas leak issues since the plant opened in 1984, and we have a trained hazmat team on call for emergencies, but we were pleased to be able to enhance that response insurance with cost-effective, on-site physical containment readiness.

“That leaves us much better prepared for any off-hours event, when there would be only one plant operator, and it would take longer to assemble the hazmat team.”

### PLANT OPERATION

The incoming wastewater stream for the design 6 MGD plant passes from the headworks into a grit chamber, followed by two primary clarifiers, and then aeration tanks, before final clarifiers that are linked to an anaerobic digestion loop. The clear water leaving the final clarifiers goes to the chlorine contact chamber.

Chlorine is pumped to injectors at the rate of 125 lbs./day, with injection performed at the final clarifiers “to give it more time to work, and also use less that way,” said Lee. He added that gas was his preferred option for chlorine addition, with the plant too big for tablets

or powder and bleach likely costing twice as much.

Two one-ton cylinders of chlorine are stored in a covered building. Sulfur dioxide, used at the end of the plant process for dechlorination, is stored inside an enclosed building.

Each chlorine cylinder was placed inside a special vessel apparatus in 2010. Each sulfur dioxide cylinder was placed inside a special vessel apparatus in 2012. The special apparatus contains and processes any leaks. The cylinder containment vessels, supplied with loaders, scale systems, and instrumentation, were manufactured by TGO Technologies of Santa Rosa, California.

“That vessel containment was much preferred to a scrubber-type solution, which would require major building modifications,” Lee noted. “A scrubber system would also have required a



Two 1-ton cylinders of chlorine are stored in a covered building. The ChlorTainer™ containment vessels were installed in 2010 with a loader, scale system, and instrumentation also supplied. A failsafe valve ties into the chlorine sensor. A vacuum regulator can be attached to remove leaking chlorine inside the vessel.



Containment vessels for sulfur dioxide cylinders, stored in a separate building, were similarly installed in 2012, with loader and scale system, and with fail-safe valves and vacuum regulators.

special six-member, trained response team to be available to deal with a leak within the building.”

“With the vessels, it is all done automatically, with minimal personal exposure. And with two tanks for each gas, we don’t have to suffer any plant process interruption if there is leak containment going on in one of them.”

#### LEAK CONTAINMENT

Lee said the procedures for leak management were not difficult, with the container manufacturer helpful with training.


“We got used to it during some minor episodes that occurred during cylinder deliveries,” he recalled. “They had been placed in the containment, so we just bypassed to the other cylinder while the gas leak was vacuumed out.”

The containment vessels were positioned on a concrete pad and bolted down. With any accidental leaks of chlorine kept within the containment vessel, no atmospheric venting is generated. The vessels are ASME-rated pressure tanks, and any leaks are recycled to the injection system at a normal flow rate. A failsafe valve ties into the chlorine sensor, so that in the event of an external release, the failsafe valve will close and sense it is under vacuum.

Any leak or release of chlorine gas from the vacuum line downstream of a vacuum regulator will lose the vacuum condition and cause the vacuum regulator to close, stopping the flow of chlorine gas to the vacuum line. The maximum release of chlorine gas will be the amount of chlorine gas that is the

length of the vacuum line to the chlorine injector, not drawn into the water solution by the suction of the injector.

There can be a question of the integrity of the system from the outlet line, where chlorine gas penetrates the wall of the pressure vessel, to the location where the vacuum line leaves the outlet side of the pressure regulator. A study has shown this could release less than 0.0009 lbs. of chlorine gas. Should there be a gas leak inside a vessel, there is no waste, as the gas is processed at a normal rate until everything is used.

Cliff Lebowitz heads Catalytic Reporting, LLC, which specializes in third-party case history reporting for industrial equipment manufacturers. Reporting is based on interviews of end users, and is approved by them for accuracy and completeness. 



Secondary Containment Equipment Addresses

# SAFETY CONCERNS FOR CHLORINE GAS

by Cliff Lebowitz\*

The superintendent of a 12 MGD water treatment plant (WTP) reports that abandoning a plan to switch from chlorine gas to bleach for primary disinfection was enabled through a well-engineered risk management plan for any gas leak risk, thereby allowing him to continue receiving much appreciated benefits from using gas.

“When I started here in 1997, there was already a design engineering study underway toward installing a sodium hypochlorite (bleach) system to replace chlorine gas,” recalled Scott Rovanpera, superintendent of the WTP, which is operated by the City of Benicia, CA.

## Reconsidering the Alternative

“But I knew of significant problems with using sodium hypochlorite in a treatment plant nearby; it was leaking at pipe unions and ball valves. I also saw that our location was in a rural area of north Benicia, with few people anywhere within a mile of the plant, thereby creating a huge buffer in the event of a gas leak. In addition, there hadn’t been a major gas leak since the plant opened

in 1971; just a few minor ones with transfer hoses when storage tanks were changed.”

“We also much appreciated the chlorine gas as an exceptionally strong oxidant that could break down the walls of bacteria and viruses, and it was far less expensive than ozone,” he continued. “Chlorine gas is the least expensive chemical we purchase; it is 100% pure, and 2,000 lbs. will last up to 25 days during the winter months.”

“We were dosing chlorine at 0.6-0.8 mg/L as a pre-oxidant to support enhanced coagulation using aluminum sulfate, thus allowing staff to treat total organic carbon (TOC) levels ranging from 4-18mg/L. For that need, we were better off with chlorine gas that could depress the pH, to assist in the removal of color. Sodium hypochlorite (bleach), which is alkaline, has a tendency to raise the pH during pretreatment. That also helped us deal with the enhanced coagulation part of EPA’s 1986 Surface Water Treatment Rule.”

“Our State Water Project (SWP) source-water contains high levels of Natural Organic Material (NOM) following storm events,”

Rovanpera noted. “The challenge of the Enhanced Surface Water Treatment Rule is to reduce the NOM precursors that form disinfection byproducts (DBP’s) when disinfecting with chlorine gas or bleach. DBP’s are heavily regulated, and this is the major issue we have to deal with when treating SWP sourcewater. We find that using chlorine gas as a preoxidant greatly assists in the coagulation of these precursors.”

## Enhancing Leak Risk Management

“Meanwhile, the chlorine gas is a heavily regulated chemical, and the use of it requires a mandated risk management program (RMP). So instead of moving away from gas, we moved toward finding ways to make the changing of our 1-ton chlorine cylinders a safer operation for our employees.”

“We located a company that builds a containment vessel for 1-ton chlorine containers,” he recalled. “The first generation of this secondary containment system utilized a hinged door, with an 18-nut locking system. Tightening those 18

nuts seemed rather labor intensive for our disinfection program. We average a chlorine container changeout every two weeks in the summer, so this locking system would be cumbersome, occurring too frequently.”

“We worked with the manufacturer to change to a two-bolt version, operated by a jack-screw drive system. Similar to a submarine hatch, the locking mechanism is based on a wheel-operated drive chain that closes two clamshells around the door.”

The ChlorTainer™ cylinder containment vessels, supplied with loaders, scale systems, and instrumentation, were manufactured by TGO Technologies of Santa Rosa, CA.

“That innovation resolved our problem,” he concluded, “and led to our changing our course of action, in 1998-99, to establishing a secondary containment system using a pressure-tight vessel design, rather than building a bleach delivery system that would’ve cost us twice as much. Our containment system effectively seals any potential chlorine releases in a secure and leak-proof vessel.”

### Leak Containment

The containment system and its conveyor racks were simply positioned on a concrete pad and bolted down. Vacuum breaker regulators are attached for fail-safe shutdown if there is a leak downstream from the containment vessel.

The vessels are designed for not less than 40 years of service. They enclose chlorine gas cylinders, the chlorine transfer hose, and seismic lock-down brackets that prevent the cylinders from moving during an earthquake.

A 1-ton chlorine container is pushed into the secondary containment vessel on rollers. The chlorine transfer hose is attached to the supply valve, pressurized, and tested for any leaks at the hose ends. Then the door is closed, and secured by the clamshell locking mechanism.

Operators switch from the standby containment vessel by opening the vacuum breaker valve. The switch-over is performed by a single operator, and does not require the wearing of a self-contained breathing apparatus (SCBA).

To test for leaks within the containment vessel, there are valved ports that can be opened for testing for chlorine gas. If a leak is discovered within the containment vessel, the operator can withdraw the chlorine gas through a vacuum line that delivers the gas into the treatment process. Thus, chlorine gas leaks are not only contained within the containment vessel, but the gas can also




*Innovative ChlorTainer™ cylinder containment vessels are designed for not less than 40 years of service. They enclose chlorine gas cylinders, the chlorine transfer hose, and seismic lock-down brackets. Vacuum breaker regulators are attached for fail-safe shutdown if there is a leak downstream.*



*A 1-ton chlorine container is pushed into the secondary containment vessel on rollers. The chlorine transfer hose is attached to the supply valve, pressurized, and tested for any leaks at the hose ends. Then the door is closed, and secured by a clamshell locking mechanism.*

be extracted, and delivered via the typical chlorine feed system.

Further information is available from TGO Technologies, [www.tgotech.com](http://www.tgotech.com), (800) 543-6603, [sales@tgotech.com](mailto:sales@tgotech.com), 3471 Regional Parkway, Ste. B, Santa Rosa, CA 95403.

\*Cliff Lebowitz heads Catalytic Reporting, LLC, which specializes in third-party case history reporting for industrial equipment manufacturers. Reporting is based on interviews of end users, and is approved by them for accuracy and completeness. 

BIOGAS BOOST AS LANDIA DIGESTER MIXING SYSTEM

# BRINGS THE *best* OUT OF CALIFORNIA FOOD WASTE





Following the successful performance of its chopper pumps at a food waste to energy facility in Chino, California, full service environmental engineering consultant and contractor ES Engineering has introduced Landia's GasMix system at the same site to help boost gas production from the facility's two anaerobic digesters.

At the biogas facility that is capable of converting up to 200,000 gallons of liquid food waste per day to renewable energy, four 15,000 gallon tanks receive macerated commercial food waste from various sources. For the past six years, each tank has been served by a stainless steel Landia chopper pump that continuously reduces particle sizes and recirculates the tanks. A chopper pump and two submersible mixers from Landia are also installed in a 140,000 gallon equalization tank, which then feeds one of two 1.2 million gallon anaerobic digesters.

When ES Engineering began managing the Chino plant, the digesters were equipped with top-mounted propeller mixers, but as Plant Manager Alfredo Ferrin explains, the amount of mixing being achieved was insufficient:

"With California being the largest dairy state in the country, the site previously took in a large volume of farm slurry, but as many of these closed, so did the treatment plant (for three years). After the reopening, we soon realized that there was big room for improvement with the digester mixing."

He added: "Our co-owners, a waste management company, have several large contracts with grocery stores and food producers for unwanted/expired products, so it was very important for us to maximize this large supply of feedstock with the right mixing system. It can vary from 10,000 gallons per day to as much as 200,000 - but on average it is 50,000 gallons per day. It was natural therefore that we consulted Landia, whose equipment had been doing a very good job mixing and pumping a wide variety of slurries with quite high levels of solids."

Designed with an external chopping system that is separated from the pump casing and the impeller to prevent clogging, the Landia Chopper Pump (invented by the company back in 1950), can work as a standalone unit, but is also at the heart of the Landia GasMix system. All chopping is completed before the liquid enters the pump housing, which significantly reduces wear on the pump casing, impeller and sealing system.

"Apart from what you'd say was fair wear and tear, we've had no major problems with the Landia chopper pumps or mixers in six years" continued Alfredo, "so their durability and performance gave us the confidence to choose the GasMix system for our digester."

Utilizing a combination of biogas and liquid recirculation for the mixing process to fully mix the digester and improve the quality of the biogas (which in turn can be used to increase power production), one of the major advantages of the Landia GasMix system is that all mechanical components are externally-mounted. This allows inspection and maintenance to be completed without having to enter or open the digester. In addition to the major health & safety advantages this provides – as well as no requirement for breathing apparatus or working at height, servicing of the Landia GasMix system can be completed while the biogas production continues uninterrupted.

Pipework is also usually mounted on the outside of the digester, but to suit ES Engineering's requirements to have no further holes made in the wall of its insulated digesters




during the retrofit, all stainless steel pipework was installed through existing manways.


“It is a big advantage to have the moving parts located outside the tanks,” added Alfredo, “and Landia were very flexible with their engineering skills to accommodate our needs for internal piping. Even allowing for the fact that the Landia GasMix had larger motors, we saw the difference straight away in the increase in biogas production. In fact, it increased so fast that we initially we had to stop running the site flare and switch the nozzles, but this was a good problem to have.”

The chopper pump that makes up part of the Landia GasMix draws sludge from the digester and pumps it through an aspirating venturi chamber. Biogas is then aspirated from the top of the digester, mixed with the sludge and injected into the tank. Powerful mixing performance is ensured in all areas of the tank by one or more ejector type nozzles and hydraulic mixing nozzles.

About a year later, when it was time to drain down the other digester at Chino for a service, the decision was made to also upgrade the mixing system in the second digester to Landia GasMix. The organic matter converted to methane by the two digesters produces 3.3 megawatts of electricity. This is ample to power everything on site and also sell surplus power to the grid.

“Before we switched to GasMix,” said Alfredo, “we would see floating matter on the top layer of the liquid, but all of the scum was soon broken down. It was clear that the whole tank was being mixed very thoroughly. Landia has also helped us with the parameters for timings and speed control so that we can control the energy costs. The Landia chopper pumps have been a great investment – and the GasMix system has made a very positive difference to our gas production.” 

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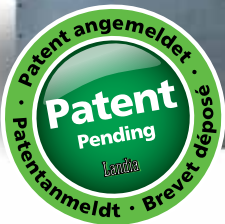
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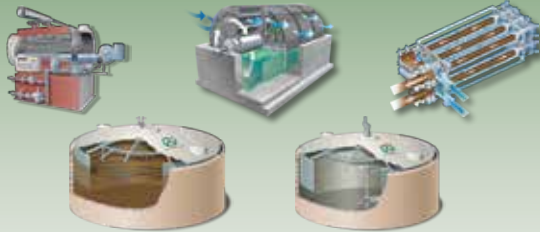
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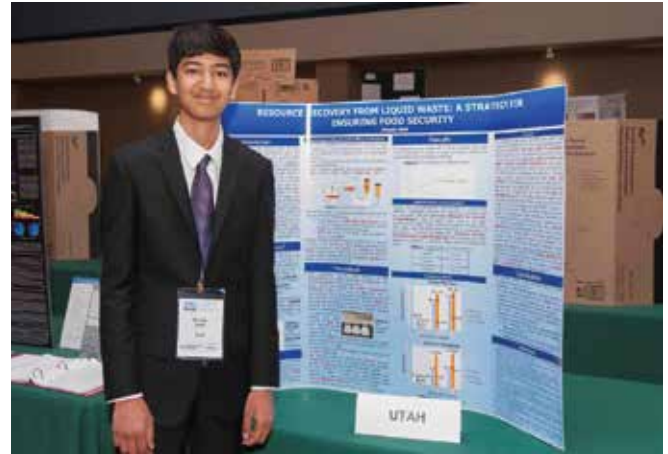


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## News & Notes

# SJWP winner Divyam Goel

This is a picture of Divyam Goel who represented Utah as our SJWP winner. A student team from New York won with a project entitled "A Novel Approach to Rapidly and Sensitive Detect and Purify Water Contaminated with Shigella, E. coli, Salmonella, and Cholera". Thanks for the continued support. [DM](#)



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## is more than just talk

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

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

June 3, 2017

A few Young Professionals participated in the National Trails Day on June 3, 2017 to clean-up Mount Olympus. The project was supported in partnership by the Cottonwood Canyons Foundation, the US Forest Service, REI, Wasatch Mountain Club, Salt Lake County, Salt Lake City, The Salt Lake

Climbers Alliance, and the Wasatch Legacy Project Partnership.

The YPs helped improve the trail by assisting with new trail construction, rehabilitation, brush removal, an invasive weed pull, and litter clean-up. The event raised awareness about the importance of

water and land conservation. The US Forest Service provided safety training and lead teams up the trail. It was a fun event open to all abilities and ages and a great way to help give back to our environmental community here in Utah. [DH](#)



## NOTICE

YP committee is holding a dinner following the midyear conference at 5pm at Red Robin (3601 2700 W B152, West Valley City, UT 84119).

# Annual Salt Lake Bees baseball game

WEAU members got out of the office Friday, July 21st to get together and catch the annual Salt Lake Bees baseball game. We had a great turnout with over 144 WEAU members and guests. The Bees provided a private deck complete with burgers and dogs overlooking 3rd base with seats located right below. Everyone was treated to a good

game against the Albuquerque Isotopes where the Bee's won 7 to 4! Before the game WEAU held a raffle with close to \$2,000 in prizes (including an Apple Watch)! All the festivities clocked in for \$10 per person which turned out to be quite the value. Big thanks to the Young Professionals Committee for organizing and running the show!

Hope to see everyone out next year and at future events! Make sure to sign up for the WEAU mailing list by sending an email to [membership@weau.org](mailto:membership@weau.org) and stay in the loop. WEAU Young Professionals and Students Group (YP's) also have an email newsletter, sign up by emailing [yp@weau.org](mailto:yp@weau.org). [DH](#)



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- Advance, multilingual display for status and setup
- Detailed datalogging
- Setting and data capture via *Bluetooth*<sup>®</sup> handheld tool
- InSight2 PC software for valve performance analysis
- Highly intuitive user interface
- Comprehensive control and flexibility

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