
From the LPC Chair

Up Coming Events

[Water Environment Federation
Disinfection and Reuse Symposium
2018](#)

July 29 – 31, 2018
Portland, Or

[Virginia Water Environment Federa-
tion](#)

[Good Practices Lab Conference](#)
July 30 – 31, 2018
Charlottesville, Va

[National Environmental Monitoring
Conference](#)

Aug 6 – 10, 2018
New Orleans, La

[California Water Environment Asso-
ciation - Santa Clara Valley
Steps to Implementing the TNI
2016 Standard – Session #4](#)

Sept 18, 2018
Palo Alto, Ca

[Imagine A Day Without Water](#)

Oct 10, 2018

North Dakota Water Environment
Federation
2018 Annual Meeting
October 15-18
Grand Forks, ND

[Georgia Association of Water Pro-
fessionals
2018 Fall Conference, Laboartory
Symposium & Expo](#)

November 6 – 7
Dalton, Ga

[WEFTEC 2018](#)

Sep 29 – Oct 3, 2018
New Orleans, La

If you check out the [Laboratory Practices Committee page](#) on WEF.org, you'll see the LPC "develops technical products to promote general understanding of laboratory practices for water and wastewater." What does this mean in real work? Consider some of the projects we've worked on in 2018 and are planning for the future.

- The LPC is hosting a "Back to Basics Workshop" at WEFTEC 2018. You can read more about it in the article on page 2.
- We worked with the Association of Public Health Laboratories to promote Environmental Laboratories Professionals Week. You can learn more about this event on the [APHL Blog](#).
- We are working to develop laboratory related documents for WEF's On-Demand Waste Water Library, OWWL. WEF's goal is for these documents to provide high quality operations-focused information on wastewater fundamentals.
- We promoted EPA's Interlab validation study for EPA Methods 624 (volatiles), 625 (semi-volatiles), and 608 (organochlorine pesticides).
- We've had guest speakers on our full committee calls. Most recently Dr. Unger of the Virginia Institute of Marine Sciences talked about the use of biosensors for quick detection of aquatic contaminants.
- We continue to put together this newsletter with goal of keeping the laboratory community engaged and connected.
- And we are already in the planning stages for a Bacteriophage Workshop for WEFTEC 2019. Yes, we have to start planning this early.

We are always interested in your concerns. Do you have an issue that could use LPC's help? Or a lab related project you wish to promote? Please contact [Jen Loudon](#) (Chair) or [Mary Johnson](#) (Vice Chair).

Will You Be at WEFTEC?

Check out these lab related activities.

- LPC Committee Meeting, 3:00—5:00 PM, Sunday, September 30
- Back to Basics Workshop, Sunday, September 30
- Wastewater Microbiology Workshop, Sunday, September 30
- Operators Challenge Lab Event, Monday, October 1.
- Nutrient Analyzer and Sensors Mobil Session, Wednesday, October 3.

WEFTEC Back to Basics Workshop



Operators learn about fecal coliform analysis at a 2015 WEFTEC laboratory workshop.

The Back-to Basics workshop being presented from 8:00 AM- noon on Sunday, September 30, 2018 at WEFTEC in Chicago this year is the perfect opportunity to refresh or gain new knowledge on troubleshooting. This workshop will focus on analyses commonly used for both regulatory and process analysis by treatment plant operators and laboratory analysts. There are some parameters that require immediate analysis, or have very short holding times, such as microbiology, that are reported for permit compliance. It is important for analysts and operators to know the chemistry and theory behind these tests to ensure data is of the highest quality. With advances in instrumentation and automation, the focus on the chemistry and theory of these tests is not the priority it once was. This workshop will be a back to basics way to cover the chemistry behind these tests by utilizing speaker presentations as well as group discussion and interactivity incorporated to ensure attendees gain in-depth knowledge of the chemistry behind the analysis they perform.

Maintenance of instrumentation and troubleshooting are also key components for generating reliable data for both regulatory purposes and process monitoring. This workshop will include additional hands-on opportunities for attendees to actually perform maintenance and learn the proper techniques for handling instrumentation to ensure proper function. Troubleshooting will also be covered through group discussion and hands-on exercises showing common problems with analysis and how to determine and eliminate possible causes, whether it is instrumentation, reagents, sample problems or other factors.

Of Interest

John Rigdon, LPC member, published an article in the Winter 2018 Indiana Digester titled *Changes in Method Detection Limit*.

A recent WEFCOM post in the LPC community space, centered on a sample of human digestate, received unexpectedly by a municipal lab, from a mortuary. The mortuary had not actually discharged but was curious if a bulk discharge would pass limits. There was quite a bit of discussion about this on WEFCOM. It turns out about 14 facilities in the U.S. liquify human remains. One LPC member works in a lab that has handled liquified marine mammal tissue. What's been your experience? Feel free to send [Mary Johnson](#) comments on this, for printing in the next newsletter.

Analyst Spotlight: LPC Chair Jen Loudon



Jen, pictured in middle, as part of team "Citizen Lead" during UN-LEASH Innovation Lab Conference in Singapore



The Dragon's Den

One of the most oft heard words in a wastewater utility laboratory is the word standard- Standard Methods, a standard reagent curve, International Organization for Standardization, etc. But there's another 'S' word that needs recognizing (no, not THAT one)- sustainability. The Cambridge dictionary defines "sustainability" as the ability to continue at a particular level for a period of time. Most of us have seen "sustainably sourced coffee" or "sustainable wood furniture" publicized by companies to make us feel better about spending more money on something in exchange for doing something good for the environment; but sustainable...wastewater treatment?

In 2015, the United Nations General Assembly adopted 17 Sustainable Development Goals (SDGs) as part of the 2030 Development Agenda, consisting of 169 targets aiming to make the world a better place by 2030 (1). One of the most important aspects of the SDGs is that they are designed to "leave no one behind"; the goals should be achieved by all member states regardless of their economic, social, or environmental positions. As you can imagine, this is quite a lofty mission, so a global initiative was started to help things along. UNLEASH Innovation Lab was introduced in 2017 to accelerate next generation ideas and partner 1,000 'talents' (students and young professionals) from around the world with companies, NGOs, government agencies, investors, and foundations that are at the forefront of innovation and global development (2). This year, they received over 7,000 applications from more than 100 countries and I was extremely humbled to be among the lucky ones chosen. My sincere thanks to the New Jersey Water Environment Association and the Water Environment Federation for their roles in making my attendance possible. My SDG of choice? Number 6- clean water and sanitation. So yes, sustainable wastewater treatment!

Each SDG has a few action items, or targets, associated with it. For SDG6, these are: achieve universal and equitable access to safe and affordable drinking water; achieve access to adequate and equitable sanitation and hygiene; improve water quality by reducing pollution, halving the proportion of untreated wastewater, and increasing recycling and safe reuse; increase water-use efficiency and ensure sustainable supply of freshwater; implement integrated water resources management; protect and restore water-related ecosystems; expand international cooperation in water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies; and support and strengthen the participation of local communities in improving water and sanitation management (1). Even in a nation as advanced as the United States, we still have work to do on all these targets. Considering something to be truly sustainable implies both environmental as well as financial responsibility. For example, developing a wastewater treatment application with a circular economic model builds long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits.

SUSTAINABLE DEVELOPMENT GOALS



Analyst Spotlight: LPC Chair Jen Loudon

(continued)



Fangirl moment meeting Jack Sim, founder of the World Toilet Organization (WTO)

Held at National University of Singapore facilities and made possible by numerous partners including: DBS Bank, Temasek, Deloitte, Microsoft, Devex, LEGO, the Carlsberg Foundation, Dalberg, and the United Nations Development Programme, talents spent an amazing eight days in Singapore learning the UNLEASH Innovation Process and making lifelong global connections. Of the 1,000 talents, 83 of us were broken into teams to work on SDG6. Thankfully, we were guided through the Lab by both technical experts and process facilitators. I was part of a team of 5 women (the only all-female team in SDG6) from 4 countries- Australia, Albania, Nigeria, and the United States. The problem that we decided to address was the environmental impacts of artisanal mining. These mining facilities are not formally owned so there are no mandatory safety/environmental regulations, this leads to personal health as well as ecological problems. In our case, children were dying from ingesting lead contaminated water. The more we explored our chosen problem, the more we realized just how enormous and complex it was (both environmentally and socially). In the end, we established that there was a lot we could not fix, but a small step toward helping these people would be to install a household-based water treatment system using sand filtration and adsorption to remove the lead and overall improve the quality of their potable water. One of the key components of our solution was that the filtration unit would be made of materials easily found in the area, such as using homemade charcoal or coconut husks as adsorption media and 55 gallon barrels for the storage half. To go along with our treatment system, we included plans for placard-style educational materials to be distributed to locals explaining small steps they could take to make the mining practice safer (ie. wearing PPE so they didn't ingest the contaminated dust) as well as care and maintenance of the filtration and storage units.

After four 20-hour days of 'innovating', we had the opportunity to pitch our ideas to a panel of judges from academia and business, as well as be a part of a Market-Place held alongside Temasek's annual sustainability focused conference- Ecosperity- where we met with members of the public and potential investors. The two highest scoring teams in each SDG then pitched in front of everyone at a ceremony called the Dragons' Den where a panel of Dragons (similar to the 'Sharks' on the TV show Shark Tank) decided the winners for each SDG. One of the best things about the program is that even if your team is not chosen as the best in your SDG, every team contributes to a published Solutions Catalogue that is distributed to potential investors around the world. You develop such strong bonds with other talents, and the problems are so important, that the closing ceremony does not have to be the end of your effort. Advancing sustainability is a lifelong mission that everyone is capable of.

1. <https://sustainabledevelopment.un.org/post2015/transformingourworld>
2. <https://unleash.org/about/>

Lab Quiz

Test your knowledge of basic – and not so basic – water laboratory analyses. Let's talk about temperature.

1. When removing a stored reagent from a refrigerator, you should first _____ before use.
 - a. warm to room temperature
 - b. check the Ph
 - c. smell it
 - d. compare to similar reagents stored in the refrigerator

2. 72 °F is what in degrees Celsius?
 - a. 5
 - b. 12
 - c. 22
 - d. 41

3. All laboratory thermometers used in analyses for NPDES reporting must be:
 - a. checked for accuracy against a NIST/NBS certified thermometer
 - b. read in both Celsius and Fahrenheit scales
 - c. full-immersion mercury-filled thermometers
 - d. able to accurately record a minimum of 0.1 C temperature variations

4. Match the analysis with the appropriate temperature.

a. BOD incubation temperature	1. $45.5 \pm 0.2^{\circ}\text{C}$
b. TSS drying temperature	2. $20.0 \pm 1^{\circ}\text{C}$
c. TDS drying temperature	3. 550°C
d. TVS ashing temperature	4. $104 \pm 1^{\circ}\text{C}$
e. Fecal Coliform incubation temperature	5. $180 \pm 2^{\circ}\text{C}$

5. At what temperature should composite samplers and refrigerators be kept?
 - a. 32°F
 - b. 40°F
 - c. 4°C
 - d. 10°C

You can find the answers on last page of this newsletter.

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Lab Quiz Answers

1. The correct answer is A.
Reference: Smith, R.-K. *Water and Wastewater Laboratory Techniques*, pg. 107
Immediate Feedback: Concentration and volume changes with temperature. Always warm a cold reagent to room temperature before use.
2. The correct answer is C.
Immediate Feedback: $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$. $^{\circ}\text{C} = (72 - 32) \times 5/9 = 22^{\circ}\text{C}$
3. The correct answer is A, checked for accuracy against a NBS certified thermometer
Reference: California State University, *Operation of Wastewater Treatment Plants*, Fourth Ed., Vol. 2, pg. 581
Immediate Feedback: All thermometers used for permit testing should be calibrated on a regular schedule with an NIST or NBS thermometer. Typically calibration occurs anywhere from once a month to once a year.
4. The correct answer are:
 - A. BOD samples are incubated for five days at $20 \pm 1^{\circ}\text{C}$.
 - B. TSS samples are dried to constant weight at $104 \pm 1^{\circ}\text{C}$.
 - C. TDS samples are dried to constant weight at $180 \pm 2^{\circ}\text{C}$.
 - D. TVS samples are ashed at 550°C .
 - E. Fecal coliform samples are incubated at $45.5 \pm 0.2^{\circ}\text{C}$.
5. The correct answer is C, keep composite samplers and coolers at 4°C .
Reference: American Public Health Association, American Water Works, and Water Environment Federation *Standard Methods for the Examination of Water & Wastewater*, 18th Ed., Washington, D.C., pg.1-23
Immediate Feedback: Keep composite samples cool during sampling, transport, and storage. Use ice or a refrigeration system set at 4°C .

About the LPC

The Water Environment Federation's Laboratory Practices Committee (WEF LPC) is made up of volunteer members from academia, consulting firms, utilities, government agencies, and manufacturers.

WEF LPC develops technical products to promote general understanding of laboratory practices for water and wastewater.

Membership is open to all WEF members.
