

Up Coming Events

[Water Laboratory Alliance Security Summit 2019](#)

November 13—14, 2019
Atlanta, GA

[Forum on Environmental Accreditation](#)

February 3—7, 2020
Newport Beach, CA

[2020 International Symposium on Inorganics](#)

April 14—15, 2020
Denver, CO

Missouri Water Environment Association

[Laboratory Practices Fall Outreach Training](#)

November 08, 2019
Shirley R. Bomar Community Center
Hannibal, MO

Georgia Association of Water Professionals

[2019 Fall Conference, Laboratory Symposium & Expo](#)

November 19-20, 2019
Athens Classic Center
Athens, GA

New England Water Environment Association

[NEWEA 2020 Annual Conference and Exhibit](#)

January 26 -29, 2020
Boston Marriott Copley Place
Boston, MA

California Water Environment Association

[CWEA Annual Conference 2020](#)

March 31, 2020 - April 3, 2020
Reno-Sparks Convention Center
Reno, NV

From the LPC Chair

WEFTEC 2019 marked the beginning of a new year for Laboratory Practices Committee. I'd like to welcome a new leadership team: Hunter Adams, Akin Babatola, Dale Baker, Jim Burks, Bill Gase, Bill Lipps, Devon Morgan, Robin Parnell, John Rigdon, Peter Strimple, Krista Thomas, Myra Zabec-Thompson. And I also want to acknowledge the continued support of our past Chair, Jen Loudon, and our CoP Director Stacie Crandall.

As a group we hope to focus on the following projects:

- WEFTEC 2020 Back to Basic Workshop
- WEFTEC 2020 PFAS Workshop
- Webcast Sharing
- MDL Webinar
- Laboratory Professionals Week
- And this e-Newsletter

Do you have a topic or project that would be of interest to the environmental laboratory community? Or want to be part of the LPC leadership team? Please contact [me](#) (Chair) or [Beth Conway](#) (WEF Liaison).

Don't forget all WEF LPC members are invited to join us for quarterly conference calls. We try to make these calls more than just project updates. Each features a guest speaker discussing a topic of interest. Recent topics have included Hampton Roads' Sustainable Water Initiative, Presence of Opioids in Wastewater as a Measure of Community Health, and Communicating with the Public about Emerging Contaminants.

With much thanks for offering me opportunity to serve as LPC Chair,

Mary Johnson

On Demand Wastewater Library

The OWWL (on-demand wastewater library) steering committee is looking for volunteers to either write or review operator fact sheets. The topics to be covered include BOD, coliforms, pH, chlorine residual and DO. If interested or would like further information, please contact Krista Thomas at kthomas@peterborough.ca

Article by Krista Thomas

LPC Full Committee Call Guest Speaker:

Mike McGill

Our August 2019 Full Committee Conference call featured guest speaker Mike McGill, President of Water PIO, a communication firm that assists utilities on communicating a wide variety of issues, including crisis issues. In addition to providing general guidance for communicating with public, he discussed specific considerations for talking about emerging contaminants.

Emerging contaminants are impacting wastewater as well as drinking water. Due to advances in water testing, chemicals are being detected that were previously undetectable. Utilities need to get in front of communicating this so that customers don't just see toxins.

- PFAS are found in stain and water resistant carpeting and clothing. It is also found in fire fighting foams used by the defense department on bases. From bases, PFAS has washed into streams, rivers, and groundwater sources. There is sizable contamination in the northeast. North Carolina also has a high amount of PFAS contaminated water. These chemicals don't breakdown – they bio-accumulate. The U.S. has moved away from PFOA and PFOS but still doesn't have drinking water standards for these two chemicals.
- Utilities generally receive zero guidance on how to communicate the discovery of chemicals in the water. A North Carolina utility is a recent example of how reporting of chemicals shakes public confidence in drinking water when the utilities haven't reached out to customers before the headlines reach the public. Utilities have to keep explaining why chemicals are in the water. While utilities are not responsible for putting the chemicals into the water, the task of cleaning it up will be dumped on utilities.
- EPA held a PFAS summit in May, 2018 and developed a PFAS action plan to evaluate PFOA and PFAS. One of the actions under the plan will be to add PFAS to the UCMR.
- States are creating their own standards on an accelerated schedule to meet political requirements given that headlines move faster than the federal regulatory process. This is resulting in a checkerboard of standards and information being dumped on public.

McGill suggested that don't think you don't have to communicate just because you're not at fault. Utilities will be believed if they reach out to their customers and the public before others do. Utilities need to get everything out front first and cover multiple platforms/social medias.

The PFAS story is shifting to wastewater and biosolids. There is even less data on biosolids than drinking water. An example of biosolids and pfas: the blame for the presence of PFAS in milk from dairy cows in Maine was pushed to biosolids (through grass). WEF had provided some strong talking points about the story but people held onto the blame of biosolids. One result may be to stop biosolids programs.

For lab people, messaging should include your expert role, how you're testing, showing the lab and having a lab expert talk about what they do every day. Risks are involved with this but the public will connect better with an actual lab employee than with a spokesperson or utility director. Don't lead off with how the lab is meeting standards because you're dealing with unknowns. Tell the customer to ask if they have questions. Use messages involving time and distance to get perspective on what a part per trillion is (e.g. 1 drop of food coloring in 14,000 gallons of water). There will always be a discovery cycle.

Article by Beth Conway

WEFTEC Operations Challenge Lab Event



This was the first year for the TDS and TSS laboratory event for Operations Challenge. To complete the event, each team must perform the following functions:

- Prepare multiple samples for TDS and TSS analysis according to laboratory protocol;
- Calibrate a YSI benchtop analyzer with calibration solution and measure the samples for TDS;
- Use an analytical balance, filter flask and vacuum pump to measure and analyze samples for TSS, taking both initial and final weights of various process samples;
- Use these measurements to estimate facility-wide solids loading, removal rates and other various process problems related to solids within the plant.

The new event went very well this year at WEFTEC in Chicago! The winners of the laboratory event this year were:

All pictures by Jeff Frederick

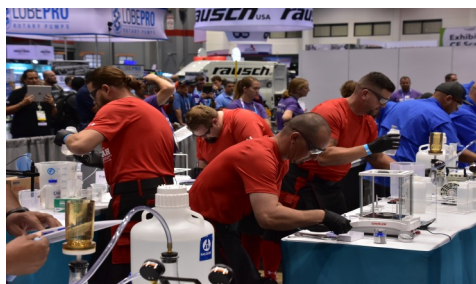
Article by Kim Riddell

Division 1

Waste Warriors – WEA of Texas
Elevated Ops – Rocky Mountain WEA
LA Wrecking Crew – California WEA

Division 2

South Mesquite Rangers – WEA of Texas
Ocean State Alliance – New England WEA
Double Duty – Rocky Mountain WEA



Lab Spotlight:

Milwaukee Metropolitan Sewerage District



1. What is the name and location of your facility?
Milwaukee Metropolitan Sewerage District (MMSD) Central Laboratory. We are located near downtown Milwaukee, in Wisconsin.
2. What is the average daily flow (MGD)?
MMSD owns two water reclamation facilities: Jones Island and South Shore. Jones Island has a maximum daily capacity of 300 MGD. South Shore's maximum daily capacity is 250 MGD. Average annual flows for 2018 were 106 and 98 MGD for Jones Island and South Shore, respectively.
3. How many analysts and/or technicians work in the laboratory?
We have 15 analysts working at the laboratory. We also have a dedicated Quality Assurance Coordinator, a Laboratory Project Manager, a LIMS Analyst, and two team supervisors.
4. What analysis do you perform?
For NPDES reporting: BOD, TSS, ammonia, phosphorus, fecal coliform, *E. coli*, and metals, except for mercury. Whole effluent toxicity, mercury, and all organic analyses are sent to contract laboratories for testing.
For operational information: COD, TKN, and several types of solids. We also test for carbon, chloride, alkalinity, silica, nitrate, nitrite, and chlorophyll in freshwater samples; HEM and sulfide in industrial wastewater samples; nitrogen, pH, and screen testing in biosolids; and microscopical analyses in plant process samples.
5. Do you accept samples for analysis from outside sources?
No, we do not accept samples for analysis from outside sources.
6. Do you have one or more contract labs you send samples to for analysis?
Yes, we have three contract laboratories that receive samples from us regularly. We use assorted others when accreditation or certification requirements demand it, particularly for analysis of Milorganite®, the biosolid fertilizer produced by MMSD.
7. What instrumentation do you use?
We use automated analyzers for the following tests : BOD, nutrients (discrete analyzers), TOC, nitrogen (solids), and HEM. We also use two ICP-OES, a fluorimeter, a UV-VIS spectrophotometer; ion selective electrodes, pH meters, and microwave digestion ovens.
8. Do you utilize a LIMS system?
We use an Access-based LIMS developed in-house.
9. What sort of certification or licensure is required/encouraged for your workforce?
Laboratory personnel are not required to have licenses or certifications to perform testing. Some of our analysts are certified wastewater treatment plant operators. The laboratory itself is certified by the Wisconsin Department of Natural Resources for chemical analyses, the Wisconsin Department of Agriculture, Trade, and Consumer Protection, for microbiological testing, and is accredited by the Florida Department of Health for chemical and microbiological analyses under the National Environmental Laboratory Accreditation Program (NELAP), following The NELAC Institute (TNI) Standards.

Lab Spotlight: MMSD, continued

10. Are there any 'out of the box' or 'pilot' testing your lab has assisted with?
We periodically partner with other institutions to provide analyses to evaluate the health of our watershed. We perform analyses supporting plant improvement processes. Most recently, we were involved in a study to determine optimal dosage of ferric iron at one of our water reclamation facilities.
11. Is there anything unusual or special about your facility or lab?
The laboratory is in its own separate building, adjacent to the MMSD's headquarters, remote from the water reclamation facilities. MMSD has produced Milorganite® since 1926, the first biosolids fertilizer made in the United States. Milorganite® is sold nationally. MMSD owns a boat, the Pelagos, that collects freshwater samples from Lake Michigan and the rivers and creeks of Milwaukee.
12. Is there anything else you would like to share?
The MMSD Central Laboratory is the largest municipal wastewater laboratory in Wisconsin. It was the first laboratory of its class in the state to receive national accreditation. MMSD is an active WEF and TNI participant. We receive numerous requests for our chemical and microbiological analytical data to support academic and governmental research.



*Article by Alfredo So-
courtesy of Starr Pentek-*



*tomayor. All pictures
Schuetz.*

Webcast Sharing

In an effort to share best practices, innovation and the latest information for lab analysts, the WEF Lab Practices Committee (LPC) is soliciting member associations for webinar presentations that have been used by the member associations. The goal of this effort is to provide a warehouse of useful seminars that can be accessed by audiences from all over the country. We believe that there are many great presentations that just need to be shared in order to educate larger audiences. If you have information please share it with John Rigdon (jarigdon@gmail.com). All webinars shared will be shared via a link – the WEF LPC page will have a link to your webinar. Also please look for future information on how to access and use the presentations that are gathered. In addition please contact Mary Johnson (MJohnson@rrwrld.Illinois.gov), John Rigdon (jarigdon@gmail.com) or Beth Conway (EConway@wef.org) with suggestions of webinars that you recommend we obtain or with topics you would like to see.

Lab Quiz

Reporting results in the correct units is an important part of the analyst's job. Answer the questions below to check your knowledge of units and unit conversion. Some questions may have more than one correct answer.

- Analytical results are sometimes reported as parts per million, or ppm. Which of the units below is equivalent to ppm?
ug/L
mg/L
%
- Put the following units in order of increasing concentration: mg/L, g/L, ug/L, ng/L.
- What is the complete name of each of the units in question 2?
- An analyst needs to prepare a 10% sodium hydroxide solution. How does she do so? The molecular formula for sodium hydroxide is NaOH. Atomic weight of sodium is 22.99 g. Atomic weight of oxygen is 16.00 g. Atomic weight of hydrogen is 1.01g.
- An analyst needs to prepare a 6 M sodium hydroxide solution. How does she do so? The molecular formula for sodium hydroxide is NaOH. Atomic weight of sodium is 22.99 g. Atomic weight of oxygen is 16.00 g. Atomic weight of hydrogen is 1.01g.
- An analyst is asked to determine the amount of molybdenum in a sludge sample. He digests 1.227 g of the sludge in acid using the appropriate digestion procedures. The sludge sample has total solids of 26.5%. The final volume of the digested sludge is 100 mL. The molybdenum concentration of the digested sludge is 120 ug/L. What is the concentration of molybdenum in the original sample as mg/kg, dry weight basis?
- Calculate the BOD loading to the receiving stream in lbs/day if a treatment plant's final effluent BOD is 3 mg/L and its flow is 10.2 MGD.

You can find the answers on page 7 of this newsletter.

Lab Quiz: Answers

1. b
2. ng/L, ug/L, mg/L, g/L. ng, ug, mg, and g are all units in the metric system. Each is 1000 times greater than the previous unit, i.e., 1000 ng = 1 ug, 1000 ug = 1 mg, etc.
3. ng/L = nanograms per liter
ug/L = micrograms per liter
mg/L = milligrams per liter
g/L = grams per liter
4. The analyst needs to dissolve 10 g of sodium hydroxide in 100 mL water to make a 10% solution.
5. By definition, molarity is a concentration unit, specifically the number of moles per liter. A mole is a convenient chemical mass unit. One mole of a substance is equal to the gram formula weight of the substance. To calculate the mass of sodium hydroxide required to make a 6 M solution, use unit conversion.

$$\frac{6 \text{ moles NaOH}}{\text{liter}} * \frac{40 \text{ g NaOH}}{\text{mole}} = 240 \text{ g/L}$$

6. This calculation is a bit tricky. You need to both convert ug/L to mg/L and correct for dry weight.

$$\frac{120 \text{ ug}}{\text{L}} * \frac{1 \text{ mg}}{1000 \text{ ug}} * \frac{1000 \text{ g}}{\text{Kg}} * \frac{1 \text{ L}}{1000 \text{ mL}} * \frac{100 \text{ mL}}{1.227 \text{ g} * 26.5 * .01} = 36.9 \text{ mg/}$$

7. The following calculation is commonly used to calculate loading rates.

$$8.34 * \text{mg/L} * \text{MGD} = \text{lbs/day}$$

Thus the calculation for this problem becomes:

$$8.34 * 3 \text{ mg/L} * 10.2 \text{ MGD} = 255 \text{ lbs/day}$$

If you were not familiar with the above equation, you could derive it using unit conversion, as shown below.

$$8.34 * 3 \text{ mg/L} * 1 \text{ Kg}/1,000,000 \text{ mg} * 2.2 \text{ lbs/Kg} * 10,200,000 \text{ gal/day} * 3.785 \text{ L/gal} = 255 \text{ lbs/day}$$

LPC Chair:

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Awards

CoP Director Stacie Crandall recognized Akin Babatola at WEFTEC 2019.

The Committee Leadership Council (CLC) and House of Delegates (HOD) created this Volunteer Service Recognition to recognize those members who significantly contribute to the successes and achievements of WEF through service in a WEF Committee or the HOD.

Akin's contributions include heavy involvement as a member of the Lab Revitalization Team, a member of the workshop program committee, and initiating the collaborative relationship WEF LPC has with APHL



Standard Methods

Standard Methods continues to be the trusted source of accurate and proven methodology for the water and wastewater laboratory community.

In 2017, Standard Methods published the 23rd edition. However, work does not stop and there is quite a bit of activity continuing in Part 4000. As you are all aware, many of the methods in Part 4000 are in need of updating. We are looking for volunteers to participate as task group chairs or as members in existing task groups. Some methods, such as pH, have existing task groups and are seeking volunteers. Other methods, such as sulfate, chloride, residual chlorine, etc.. are in need. Of review and updating.

If you, or someone you work with are interested, please feel free to [William Lipps](#) or [Nathan Edman](#).

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.

If you would like to be added to the newsletter mailing list, send your name and email to econway@wef.org.