The DeEP END

DEPARTMENT of ENVIRONMENTAL PROTECTION: ENDEAVORS, NEWS, & DEEDS

BUREAU OF LABORATORIES NEWSLETTER

Volume 3 June 2013

Introductions

Welcome to new full time employees

Michael Azar (Chemist 1, QA & Safety Section) joined the BOL in February after earning a B.S. in chemistry from Shippensburg University. His undergraduate research focused on theoretical physical and inorganic chemistry fields. In addition, Mike served six years in the military while completing his studies.

Jennifer Clark (Chemist 1, Radiation Section) completed a B.S. in biochemistry from Messiah College while working as an ICU nurse's aide and at an insurance company. Looking to change her career path, she came to the BOL in April. She enjoys her work in the Radiation section and is excited for her wedding in June and the arrival of a new baby this fall.

Kirsten Patrick (Technician, Organics Section) graduated from Seton Hill University with a B.S. in forensic science and a major in Spanish. Prior to joining the BOL in December, she held an internship with the Pa. State Police Forensic Services Unit developing techniques in obtaining latent fingerprints from evidence and worked for the United States Postal Service as a clerk.

Amber Ross (Chemist 1, Organics Section) holds a B.S. in chemistry/forensic science certification from University of the Sciences in Philadelphia. Before coming to the BOL in April, she completed an internship at Lawrence Livermore National Laboratory and worked as an Instrumentation Specialist at Cargill Cocoa and Chocolate in Lititz while analyzing chocolate samples.

Lisa Southers (Clerk Typist 3, Administration) returned to the BOL in February. She previously worked as an IT consultant in the private sector, as a temporary clerk at the BOL, and as a clerk typist 2 at the PLCB. Lisa is the proud mother of three and grandmother to 4 year old Vincent. She enjoys gardening, scrapbooking, riding her Harley, and hitting the beach as often as possible.

Shawn Spuhler (Chemist 1, Administration) joined the BOL in August 2012 with a B.S. in chemistry from Shippensburg University. His undergraduate research projects involved both organic and analytical chemistry fields. He currently enjoys working in both the solids and automated inorganic laboratories.

Moving on up….

Congratulations to the following members of the Organics Section on their recent promotions:

Megan Snyder was promoted to a Chemist 3 supervisor position in March. She joined the BOL in 2008 as a Chemistry Technician and, along with new supervisory duties, will continue to perform pesticide and petroleum compound analyses in various types of samples.

Carla Walter was promoted to a Chemist 2 position in June. Her work focused on PCB analysis upon joining the BOL in 2010. Her new position involves detection of semi-volatile organic compunds in non-drinking water, soil and oil samples as well as analyses for herbicides.

Check us out

This newsletter highlights BOL employees and notable activities occurring at our laboratories. For more information, please visit our website at:

http://pa.gov/portal/server.pt/community/labs/13780

Pennsylvania Department of Environmental Protection, Bureau of Laboratories is located at 2575 Interstate Drive, Harrisburg, PA 17110

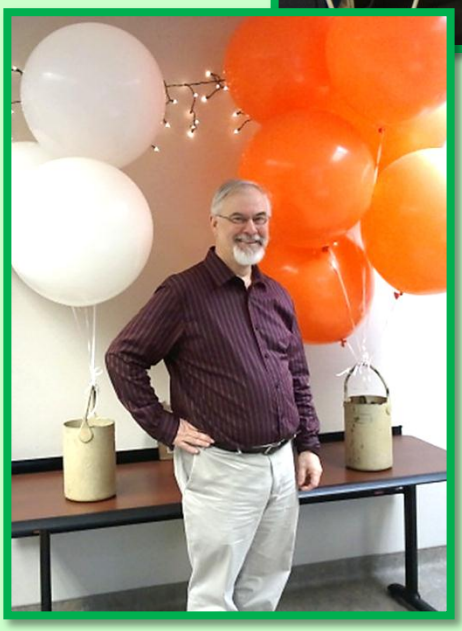
Rory Kehler in the (Retirement) Employee Spotlight

Rory hails from the small town of Mandata in Northumberland County. He earned his B.A. in biology with a minor in chemistry at Millersville University and joined the Bureau of Forestry in the Department of Environmental Resources in 1976. For eight years, Rory was involved in developing programs to quell the exploding gypsy moth population in the mid-1970s that was defoliating the hardwood trees of Pennsylvania. The suppression efforts included the use of parasitic flies / wasps and multiple chemical sprays before the biological insecticide *Bacillus thuringiensis* (BT) was found to effectively kill gypsy moth larvae by intestinal disruption.

By 1984, Rory found his way to the Bureau of Laboratories in the Shipping and Receiving section, joined the Radiation Measurements section four years later, and then moved on in 1996 to the Organics section, where he became a supervisor in 2000. For 17 years, he has been involved many aspects of organics analysis but most recently focused on herbicide and pesticide analyses, detection of carcinogens (such as industrial PCBs) and haloacetic acids (byproducts of water sanitation techniques), and new methods for glutaraldehyde (a Marcellus Shale drilling-related chemical), diquat and paraquat compounds.

Outside of the laboratory, Rory volunteers in church activities (e.g. teaching Sunday school to teenagers) and enjoys antiquing with his wife. He has a vast collection of Wizard of Oz memorabilia and a passion for "paper ephemera" that includes his favorite collectables: a set of all *TV Guides* since 1953 and famous autographs of many horror/villainous actors: Lon Chaney Sr. & Jr., Boris Karloff, Peter Lorre, and Bela Lugosi. Upon retirement, Rory is looking forward to continuing to buy and sell antiques, getting to mow his extensive lawn in the daytime, traveling with his wife (Alaska and the Grand Canyon currently lead the list), visiting his three children, and enjoying two new feline additions to the family: Lady Grey and Gimli.

Rory prepares some samples to detect the presence of herbicides by EPA Method 555 using HPLC, the "most reliable and trouble free analysis" he has performed at the BOL.



Rory was honored for his many years of service with a retirement party at the BOL in January. The balloons were a surprise from his daughter: the same ones he used at the Bureau of Forestry to mark areas for helicopters to spray for gypsy moth control. The BOL will miss Rory's good nature and excellent work. The staff wishes him all the best for his retirement years!

DeEP END Questionnaire

What is the best aspect of your job?

Working with great people and fiddling with the instruments

What is your favorite natural resource?

All the Pennsylvania state parks, especially the state forests

What work-related acronym or industry term do you dislike the most?

Industrial pollution – because it is very harsh to the environment. Rory enjoys knowing that his career assisted in mitigating its effects.

What other profession would you most want to attempt if you could?

Entomologist. Rory was intrigued by this field, but never pursued it after becoming allergic to the gypsy moths while at the Bureau of Forestry!

Any final advice for the BOL staff?

" Everybody just live long and prosper."

Student interns arrive at BOL…..

Four interns were welcomed to the laboratories this summer to learn techniques in environmental analytical testing across all disciplines and assist in two special projects at the BOL. Pictured are from the left:

Selina Prettner, a rising junior chemistry major from Shippensburg University; **Alaina McDonnell,** a rising sophomore biochemistry major from University of Tampa; **Courtney Newcomb**, a rising senior biology major from Messiah College; and **Daniel Wilson,** a rising junior biology major from Clarion University.

……will assist in summer projects

In February, the Division of Water Quality Standards in the Bureau of Point and Non-Point Source Management announced the **2013 Proposed Susquehanna Sampling Plan** to further develop sampling methodologies for larger surface waters and to provide a sound, scientifically defensible assessment of the Susquehanna River and two other Pennsylvania surface waters. Increased concern for the health of the Susquehanna River arose upon observation of decreased viability of the young and increased prevalence of intersex characteristics in the adults of smallmouth bass. The **comprehensive survey** will include the evaluation of algae, macro invertebrates, mussels and fish as well as continuous in-stream monitoring of hydrological and chemical fluctuations of the river's main stem and many tributaries. In addition, passive samplers will be deployed for the detection of low levels of herbicides, pesticides, and substances that may contribute to estrogenicity and androgencity in fish. The BOL will assist with the project by **analyzing algal cellular nutrients, water chemistry parameters,** and **diatom populations.**

The DEP Bureau of Radiation Protection has launched a **year-long study** to survey the naturally occurring radioactive material (NORM) and technically enhanced NORM (TENORM) related to the **oil and gas activity** across the state. These materials are naturally present in shale formations and can impact many aspects of conventional and unconventional drilling processes and their waste products. The comprehensive study will assess the **presence of TENORM** at drilling sites (in ambient air, recovered natural gas, equipment, stored wastewater, and drill cuttings) and in the waste material that is trucked off-site for disposal at recycling / treatment facilities and landfills. The BOL will use gamma, alpha, and beta spectroscopic techniques to identify and quantify TENORM in over **1700 solid and aqueous samples** for the study. In addition, tritium and radon analysis will be conducted. The final report of the survey will provide a more complete understanding of the movement and exposure pathways of NORM/TENORM during oil and gas exploration and production processes.

Did you know?

-Radium (Ra) is a naturally occurring radioactive element formed from the decay of natural uranium. Due to its solubility, radium-226 (the most common Ra isotope) in shale deposits may accumulate in wastewaters, pipe scales, and sludge generated at gas drilling sites.

-Radium was discovered in 1898 by Marie Curie, whose name is honored as a radioactivity unit: 1 Curie equals the amount of radioactivity which has the same disintegration rate as 1 g of Ra-226 = 3.7×10^{10} disintegrations per second.

-Radium was previously used to produce self-luminous paints for watches/dials, neutron sources, and medical treatments until the health effects (anemia, cataracts, and bone cancer) from significant radium exposure were determined.

Materials & Methods

New equipment and techniques

The Radiation Measurements section of the BOL has incorporated new protocols for analysis of radioactive isotopes. A method developed at the Georgia Institute of Technology for the **determination of radium 226/228** in **drinking water** allows for faster sample preparation and decreased ingrowth time of daughter isotopes. The second method employs direct counting by gamma spectroscopy to detect **TENORMs** present in **sludge** and **wastewaters** produced by gas drilling activity. Both methods decrease reporting time for radioactive isotope data to assist in DEP monitoring activities.

The Mobile Laboratory Group (MLG) recently installed a **Unity-2 Thermal Desorption System** equipped with a **CIA Advantage Air Sampling Accessory** (Markes International) onto its Agilent 6890/5975 Gas Chromatograph/Mass Spectrometer to increase the number of compounds that can be quantitated in ambient air and other vapor phases. For example, the MLG staff plans to develop an in-house method for analyzing **hydrogen sulfide** and other low-molecular-weight **organic sulfur compounds** in ambient air.

Partial funding from the Bureau of Mining Program assisted the BOL in purchasing two new instruments. The Trace Metals Section acquired an **Optima 8300 Concentric Inductively Coupled Plasma Spectrometer** for increased detection sensitivity of metals in mining samples. The Automated Inorganic Section purchased a **Turbidity / Specific Conductance Automated Dual System** to provide more efficient measurement of these parameters within the 48 -hour hold time limit for analysis. The BOL receives over 10,000 mining-related samples a year for testing.

The Organic Chemistry section purchased a new **Accelerated Solvent Extraction 350** unit for preparation of fish tissue samples for PCB/pesticide analyses and of soil samples for detecting semi-volatile compounds. In addition, a new **Gas Chromatograph** with dual **Electron Capture Detectors** instrument was obtained from Agilent Technologies to support the analysis of samples for haloacetic acids (byproduct compounds formed during chlorine treatment of water for disinfection) and ethylene dibromide (an anti-knock gasoline compound that was also previously used as a common pesticide).

Technical training / Workshops

To increase the BOL's scope of services in monitoring water quality in the state, Bryan Beltran (Biological Section) attended the **North American Lake Management Society (NALMS) Symposium** at the University of Wisconsin in Nov 2012. Talks focused on monitoring nutrient loads for water quality and the impacts of algal/cyanobacteria populations on waterways and lakes. In addition, hands-on training for diatom identification to the species level by leading phycologists in North America was accessible. In May, Bryan and Jeff Butt (DEP Water Pollution Biologist) attended the **Iowa Lakeside Laboratory's Short Course on Diatom Identification** led by the world renowned diatom expert Sarah Spalding of the USGS.

Janelle Barry (Section Chief, Radiation Section) participated in the National Analytical Management Program (NAMP) **Basic Alpha Spectrometry Training** course in Clemson, S.C. from April 1-5, 2013. The training combined lecture-based reviews of the fundamentals of alpha spectroscopy with hands-on laboratory based training. Demonstrated laboratory techniques included ion exchange separation, extraction chromatography, electro-deposition, and microprecipitation / filtration.

Two members of the Biological Section, Tony Russo (Section Chief) and Bryan Beltran, (Microbiologist 1) spoke at the **Water Pollution Biologist's Annual Workshop** hosted at Nature's Inn, Bald Eagle State Park, on Oct. 9 - 10, 2012. Tony presented a talk focused on the recovery of *Fecal Coliforms* from ambient water sources. Bryan discussed the increasing role of plankton identification in water impairments and the new plankton reporting method via BOL's Laboratory Information Management System.

Taru Upadhyay (BOL Technical Director) was one of 50 individuals selected by the EPA with significant relevant experience to attend the **EPA Technical Workshop on Analytical Chemical Methods** in Raleigh, N.C. focused on the study of potential impacts of hydraulic fracturing on drinking water resources. Discussions focused on EPA methods and analytes, indicator parameters for ground water contamination associated with hydraulic fracturing, detection of methane in water using the purge and trap technique, isotopic analysis in determining the origin of hydrocarbons in groundwater, and beneficial reuse of produced / flowback waters.

National conferences and meetings

Aaren Alger (Laboratory Accreditation Section Chief) and **Martina McGarvey** (BOL Bureau Director) attended the Forum on Laboratory Accreditation in Washington D.C. a joint meeting of the NELAC Institute (TNI) and the National Environmental Monitoring Conference (NEMC) on Aug. 6-9 2012. The NEMC sessions included presentations of current testing and experiences with Marcellus Shale development, new methods and testing opportunities, and developing methodologies. The TNI sessions discussed a new draft standard for quality systems and proficiency testing, development of an approval process for non-governmental accreditation bodies (NGAB), and the state of national accreditation. Both also attended the TNI winter meeting in Denver CO, Jan. 14-17 that included discussion of implementation of the TNI Standard; consistency between NELAP Accreditation Bodies (ABs), assessors, and assessments; proficiency testing requirements; and third-party ABs and third-party assessments.

The International Didymo Conference was held Mar. 12 -13 in Providence, R.I. and focused on the detection prevention, and control of the invasive freshwater algal species known as Didymosphenia geminate ("Didymo") which was recently found in the state's rivers and streams. This species is also referred to as "rock snot" due to the gooey appearance of the massive blooms it produces. **Bryan Beltran** (Biological Section) and **Jeffrey Butt** (DEP Water Pollution Biologist) traveled to the conference to enhance the state's ability in identifying and enumerating Didymo in Pennsylvania's waterways.

Didymo (rock snot) algal blooms are not harmful to humans, but can have serious effects on the habitat and food supply of aquatic organisms. This algal species is spread among multiple state waterways in microscopic form on fishing and other freshwater recreational equipment.

Photo is by Tim Daley (DEP) via the Pa. Fish and Boat Commission

Pamela Higgins (Special Assistant to Laboratory Operations) facilitated a 90-minute interactive session along with Meredith Allen (National Radiation Readiness Alliance) and Megan Latshaw (Association of Public Health Laboratories) at the 2013 National Public Health Preparedness Summit, in Atlanta, Ga. from Mar. 12-15, 2013. The session discussed "Prioritization of Laboratory Samples Following a Radiological Incident" which included topics related to assessing laboratory capabilities for sample screening and management, maintenance of quality assurance measures and 24/7 testing operations, and efficient reporting and sharing of data. The Summit focused on improving public health and healthcare preparedness through innovation, integration, and implementation strategies.

Six members of the **BOL staff** attended the PittCon Conference and Expo, the world's largest annual premier conference and exposition on laboratory science, at the Pennsylvania Convention Center in Philadelphia on Mar. 18, 2013. It is organized by The Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, a Pennsylvania not-for-profit educational corporation that is comprised of the Spectroscopy Society of Pittsburg (SSP) and the Society for Analytical Chemists of Pittsburgh (SACP). PittCon attracts more than 17,000 attendees from industry, academia, and government from 90 countries worldwide. The BOL group attended The Future of Marcellus Shale networking session in the afternoon where former DEP Secretary Michael Krancer was a member of the discussion panel.

The APHL Annual Meeting and 7th Governmental Environmental Laboratory Conference was held in Raleigh, N.C. from June 2-5, 2013. **Pamela Higgins** (Special Assistant to Laboratory Operations) moderated a 90-minute session entitled "Marcellus Shale Gas Development: Effects on Environmental Laboratory Operations in Pennsylvania" and presented the impacts and operational advancements at the Pennsylvania BOL in response to shale gas drilling. **Dennis Leeke**, General Manager of PACE Laboratories in Pittsburgh, spoke about unique impacts on commercial laboratories. The session sparked the interest of laboratory directors from neighboring states in which hydraulic fracturing is currently in use or may be implemented in the near future. Other sessions focused on topics that included food safety, newborn screening, nanotechnology, outbreak surveillance and laboratory informatics.

Results & Discussion

EPA Technical Systems Audit

On Aug. 6, 2012, the Bureau of Laboratories was audited for **air sample analysis** by Kia Hence, a lead EPA auditor, and Loretta Hyden, EPA auditor, from **EPA Region III.** They were accompanied by Kirit Dalal, Environmental Group Manager from Bureau of Air Quality and Nick Lazor, Air Quality Monitoring Division Chief. Taru Upadhyay (BOL Technical Director) provided the overview of air sample analysis performed in various analytical sections and Jim Yoder (Quality Assurance Manager) provided copies of Standard Operating Procedures, the BOL Quality Manual and the BOL laboratory accreditation listing. The lab tour featured explanation of air canister analysis by EPA Method TO-15 for organic analytes and new heating block sample preparation procedure for detection of metals via Inductively Coupled Plasma/Mass Spectroscopy (ICP/MS) as well as an overview of sample receiving, weighing and distribution of high volume air filter samples for inorganic analysis. The auditors took pictures of the instruments and commented about the impressive lab operations.

Kelly McMullen (Air Chemistry Section) prepares filters for analysis of fine particulate matter in ambient air samples.

Laboratory Accreditation Enforcement Updates

On July 27, 2012, the **Pittsburgh Water & Sewer Authority (PWSA)** in Allegheny County entered into a Consent Order and Agreement (COA) with the department whereby it agrees to **correct outstanding deviations** from a recent on-site assessment conducted by the Bureau of Laboratories Laboratory Accreditation Program, pay a **penalty of $10,000**, and hire a consultant to aid the laboratory in improvement of its management of the laboratory and adherence to the accreditation requirements. PWSA is a public water supply that conducts testing of drinking water samples for the Pittsburgh area.

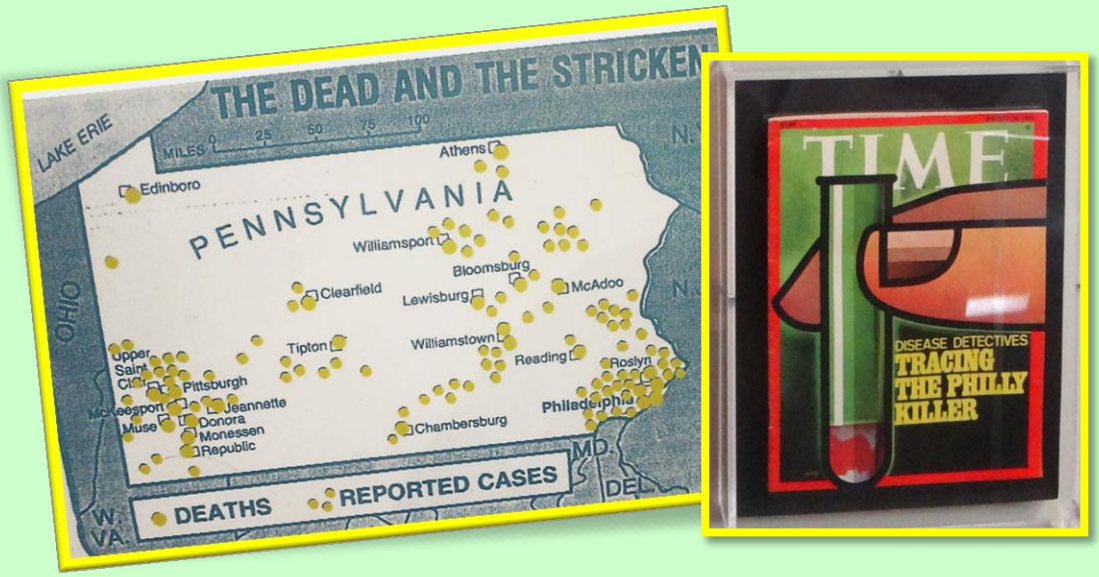
On Friday, Aug. 31, 2012, **Free-Col Laboratories** in Crawford County, and **Modern Industries** in Erie County agreed to relinquish all of their laboratory accreditation and cease the testing of DEP compliance samples. Free-Col failed to accurately report numerous SDWA, NPDES, and Oil and Gas Act compliance samples to the Department. Based on these failures and continuing violations of a June 2012 Consent Order and Agreement (COA) between Free-Col and the department, both laboratories agreed to **voluntarily withdraw their accreditation** rather than face a unilateral decision by the Department to revoke accreditation in full.

On Monday, Sept. 10, 2012, **Michael J. McKenna**, owner/president/technical director of **Blue Marsh Laboratories, Inc.** formerly of Douglassville in Berks County, was sentenced to **nine months in federal prison** and approximately **$14,000** in fines and restitution. Mr. McKenna pleaded guilty to federal charges of conspiracy, fraud and theft in June 2012. The department revoked Blue Marsh's laboratory accreditation in 2003 and the laboratory was able to regain some accreditations in the years that followed. However, the laboratory consistently demonstrated a lack of willingness or ability to comply with the accreditation regulations. The BOL Laboratory Accreditation Program conducted five on-site assessments of Blue Marsh between 2003 and 2006. Blue Marsh allowed its accreditation certificate to expire in February 2008.

Collaborative efforts contain Legionella outbreak

In late August 2012, the BOL was instrumental in providing crucial analytical results to the South Central Regional Office Drinking Water program that was part of a team between the staff from the **Departments of Environmental Protection** and **Health** investigating a series of **waterborne illnesses** linked to clients of a Dauphin County hotel. The BOL was able to detect and isolate cultures of the pathogenic bacterium *Legionella* from potable and non-potable water samples using a method based on a protocol by the Center for Diease Control and Prevention. The presumptive positive cultures from the BOL were sent to PA Department of Health's Laboratory in Lionville for confirmation. By partnering together, the departments were able to confirm a systemic contamination of ***Legionella*** present in the hotel's **water supply system**. Recent guests of the hotel were notified of the situation and the hotel voluntarily shut down before regulatory enforcement was sanctioned.

Legionnaires' disease acquired its name in 1976 when guests at an American Legion convention at the Bellevue-Stratford Hotel in Philadelphia began suffering from pneumonia-like symptoms. The *Legionella* bacteria cannot be passed directly between individuals, but rather inhaled/ingested from contaminated water sources such as showers, faucets and air conditioning systems. Initial symptoms of infection include fever, chills, headache and a cough along with progressive loss of appetite or coordination, diarrhea and vomiting. The disease is curable with early antibiotic treatment, but can be fatal if left to progress untreated.



Photos taken by Pamela Higgins of the DEP BOL.

An ominous figure from a Newsweek article and a cover of Time magazine from 1976 on display at the Center for Disease Control and Prevention museum (Atlanta, GA) chronicle the first ever outbreak of fatal Legionnaires' cases. More recent outbreaks were identified in 2012 due to Legionella found in water systems at a Dauphin County hotel and a hospital in Pittsburgh.

Mobile labs roll into landfill investigations

The BOL's Mobile Analytical Units have been busy performing **real time ambient air monitoring** analyses related to problems associated with two PA landfills. The Field Operations Supervisor of the DEP Greensburg District Office requested on-site monitoring near a landfill in Rostraver Township (Westmorland County) where **odors have been problematic**. After two days of on-site analysis in February, the results were forwarded to regional staff for review. Linda Hreha, Mobile Laboratory Group Supervisor, also responded to a request in March by the Bureau of Waste Management in the Northeast Regional Office to monitor the air on the site of a **several acre landslide** at the Chrin Landfill in Easton (Northampton County). Using an Open Path Fourier Transform Infrared Spectrometer, the Mobile Laboratory analyzed samples as Chrin landfill crews were beginning the excavation of the landslide. Results were reported to the Bureau of Waste Management upon completion.

Appendix

KUDOS for employee accomplishments:

Congratulations to **Eric Nkurunziza** (Laboratory Accreditation Officer) who will participate in the **2013 World Taekwondo Championships** in Puebla, Mexico this coming July. He will be competing with a team representing the country of Rwanda. The BOL wishes Eric the best of luck in the tournament!

Farewell:

The BOL extends good wishes to the following staff members who have decided to pursue other career opportunities: Heather Gebhart, Frank Lozupone, Brie Luttenburger, Kelsey Pirano, and Kellie Solnoki.

Outreach efforts:

A **crude oil spill** in Warren County required priority analysis of water from three **private wells** located nearby. Four samples were submitted to the BOL for volatile organic analysis and preliminary results were reported the same day. There were no volatile organic compounds detected in any of the samples.

BOL staff received samples for emergency testing in response to two separate suspected **drinking water tampering incidents**: one in Berks County, the other in Lancaster County. BOL staff members analyzed samples throughout the evening as a "Do Not Consume" Advisory was issued at the time of suspect activity. For each incident, all laboratory results were reported within 24 hours. No drinking water contaminants were detected at either site, allowing the lifting of advisories.

The Environmental Group Manager from the North-central Regional Office requested priority for water samples collected in response to a **well control incident** at the Eastern Oil and Gas Company in Wyoming County. Field staff from regional DEP offices collected residential and surface water samples for organic, inorganic and radiological analyses which included volatile, semi-volatile analysis in drinking water, glycols, alcohols, methane, nutrients, metals, gross alpha/beta and radionuclides by gamma spectroscopy. Results were available within a few days.

The **BOL** hosted **tours** for environmental classes from three local **academic institutions**: Harrisburg University of Science and Technology, Millersville University and Dickinson College. The tours involved all main lab sections (radiological, bacteriological, inorganic and organic) and the Mobile Analytical Units. Section chiefs gave demonstrations to explain how the lab supports DEP activities related to environmental regulations, monitoring, and investigations by using certified testing protocols that detect a wide variety of environmental contaminants in air, water, and soil matrices.

The BOL was able to assist the Bureau of Investigation (BOI) following an **illegal dump** of **unknown oil/product/waste material** in Clearfield County. Priority turnaround for collected samples was requested to help identify potential sites and businesses in the area that may have generated the waste. PCBs, metals, and TOX were not detected in the samples. However, the volatile, semi-volatile, and UVIR analyses indicated the presence of a mid- to heavy-weight petroleum product with a strong aromatic component.

During **excavation activities** at the Lock Haven Sewage Treatment Plant Construction Site in Clinton County, several workers were affected by **fumes**. The emergency response team from DEP Northcentral Regional Office responded and collected soil samples for volatile, semi-volatile and inorganic analyses. The volatile and semi-volatile results showed the presence of mainly polycyclic aromatic hydrocarbon (PAH) compounds at concentrations up to 40 mg/kg. These potential carcinogens occur naturally in the soils or can be generated by incomplete combustion of fossil fuels.

Staff from the Northwest Regional Office requested priority analysis to assist with a **waterborne illness** investigation. Water samples from a campsite in Monroe County were submitted for testing of **Total Coliforms** and ***E. coli*** when 30 to 40 campers became ill after using the campsite.

Any questions or comments?

Contact: Martina McGarvey
DEP Bureau of Laboratories
PO Box 1467
Harrisburg, PA 17105-1467
717-346-7200
mmcgarvey@pa.gov

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