



Environmental **NEWS**

Spring 2017

Air Testing Superiority Around The World

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eurofins

**Environment
Testing**

Comprehensive National Environment Testing

Eurofins Environment Testing US— Differences Make Us Stronger



*Paul Wise, President,
Eurofins Environment Testing NA*

There is value in specialization. In everyday life we can identify countless numbers of examples where specialization and differentiation create and sustain a world that affords more people with the best health, environment and standards of living than the world has even known. Specialization enables us to develop our knowledge and capabilities to more fully understand the complexities and subtle nuances of the challenges we face and to then create innovative and effective solutions. At Eurofins Environment Testing, we have incorporated the concept of specialization into our operational DNA and organizational structure. And while we strive to develop and deliver industry leading capabilities in each of our specialized areas of focus, we also work very hard to knit them together to form comprehensive and unified offerings to our customers. At Eurofins, we call this focus on specializa-

tion, delivered in a comprehensive and cohesive package, “Centers of Excellence”. It is important to note that this concept is present throughout all of Eurofins, enabling comprehensive services across virtually every sector of the economy and geography...from the environment to health care to manufacturing and even international commerce.

In the Environment Testing business line, our specialized laboratories, such as Eurofins Air Toxics (air testing); Eurofins Eaton Analytical (drinking water testing); Eurofins Frontier Global Sciences (metals and metals speciation); and Eurofins QC (aquatic toxicology), are highly focused and world leaders in their respective testing fields. Our other businesses such as Eurofins Lancaster Laboratories Environmental, Eurofins Calscience, and Eurofins Spectrum Analytical, are full-service laboratories but each possess unique offerings such as ultra-low detection limits, marine sediment analysis or hyper-rapid turn-around-time. They are able to accommodate and test many different matrices, providing “turn-key” and comprehensive analytical packages to clients looking for “one-stop-shop” service. In addition, each of these laboratories focuses on specific customer segments, specializing in the data deliverables and customer sup-

port required to provide solutions unique to these clients. In this way, each of these labs are “Centers of Excellence” for their given deliverables.

The difference in the services we provide across all the Eurofins Environment Testing laboratories offers an advantage to our customers. We are able to accommodate the broadest array of requests, whether it is highly specialized or more “standard” work. Through our focus on specialization to build and maintain best in class knowledge and capabilities, coupled with the integration of work product across all of its laboratories, Eurofins is uniquely positioned to provide the best services and most specialized analyses possible by utilizing these highly specialized laboratories, with the support of the full-service locations.

As you read through this newsletter, please take note of the specialization of services between the Eurofins Environment Testing laboratories. I invite you to reach out to your laboratory contact or visit www.EurofinsUS.com to learn more about these and any additional services offered within Eurofins Environment Testing as well as learn how our unique structure affords you an advantage to the largest comprehensive service offerings with highest standards of performance.

Air Testing capabilities in Australia expand global services footprint

Dr. Bob Symons, National Technical Manager, Eurofins mgt, Australia; Heidi Hayes, Technical Director, Eurofins Air Toxics, US

Eurofins Air Toxics has been supporting air testing in Australia for the last 20 years. With the establishment of Eurofins mgt in 2011 in Australia, a strong relationship between the two Eurofins organizations was forged with air samples being transported between the U.S. and Australia and analysis conducted at Eurofins Air Toxics in Folsom, CA.

In 2013, the Australian Government's National Environment Protection Council (NEPC) revised the National Environment Protection (Assessment of Site Contamination) Measure (NEPM). This initiative formalized the need to consider soil vapor measurements when assessing locations that may have dubious histories with the likelihood of contamination from the historical use of volatile organic compounds (VOCs). The introduction of the NEPM meant that local laboratories intensified their efforts to introduce the testing capabilities with most entities adopting US EPA Method TO-15 as the most widespread methodology. Historically, Australian environmental regulators have used US EPA methods as their reference so the NEPM QA/QC requirements are nearly identical to what is being done in the US. Furthermore, some regulatory programs are even moving to adopt the US Department of Defense's QSM 5.1

While Eurofins Air Toxics was well-positioned to meet the requirements of the NEPM and other regulatory programs, transportation of summa canisters and associated sampling media from one side of the world to the other, plus Australia's geographical size, presented numerous challenges especially with the people at Australia's Border Force who viewed these canisters with some suspicion. The President of Eurofins Air Toxics, Robert Mitzel and Eurofins mgt's Managing Director, Sefton McGraw, saw the potential for using the strong brand



and reputation of Eurofins Air Toxics for delivering a quality product and the opportunity to establish a local Australian facility to be able to quickly respond to the ever-changing marketplace. In December 2016, Dr. Bob Symons, National Technical Manager, and Dr. Jack Thompson, Emerging Contaminants, Specialist Chemist, traveled to the Eurofins Air Toxics in Folsom, CA, where they were provided with unfettered access to the technical and quality teams, transferring this intellectual property back to Eurofins mgt's laboratory located in Brisbane. A duplication of services and equipment primarily related to EPA Method TO-15, plus compounds associated with ASTM D1945 and 1946 was established with instrumentation that arrived at the end of March 2017.

Methodologies used at Eurofins Air Toxics in the U.S. were directly transferred and validation commenced. To assist with some technical fine-tuning of instruments prior to the audit for ISO/IEC 17025 accreditation, Eurofins Air Toxics' senior chemist, Diane Benton, traveled to Australia in early April 2017. The final submission to the accreditation body NATA (National Association of Test

Authorities, Australia) was made at the end of April, and the lab is now waiting for the final approval before samples can be accepted. The technical expertise provided by the Eurofins Air Toxics team, as well as all the Quality documentation such as SOPs, work instructions and various forms has made the task of establishing a greenfield laboratory all that much easier, and has probably halved the time it would have taken under normal circumstances. Duplication of equipment, processes, and quality systems also insure that the high quality analyses that are delivered to the customer from Eurofins Air Toxics in the U.S. will be likewise delivered locally from the Brisbane laboratory.

With the strong connection between the Eurofins teams, the technical resources and methods available at Eurofins Air Toxics in the U.S. are also accessible to the Australian market. Whether new passive sorbent techniques are under consideration for indoor air quality assessments, outdoor ambient monitoring or soil gas measurements, or whether a new technique is required to detect a trace level VOC in a complex matrix, the Eurofins Air Toxics team is ready to assist regardless of the hemisphere.

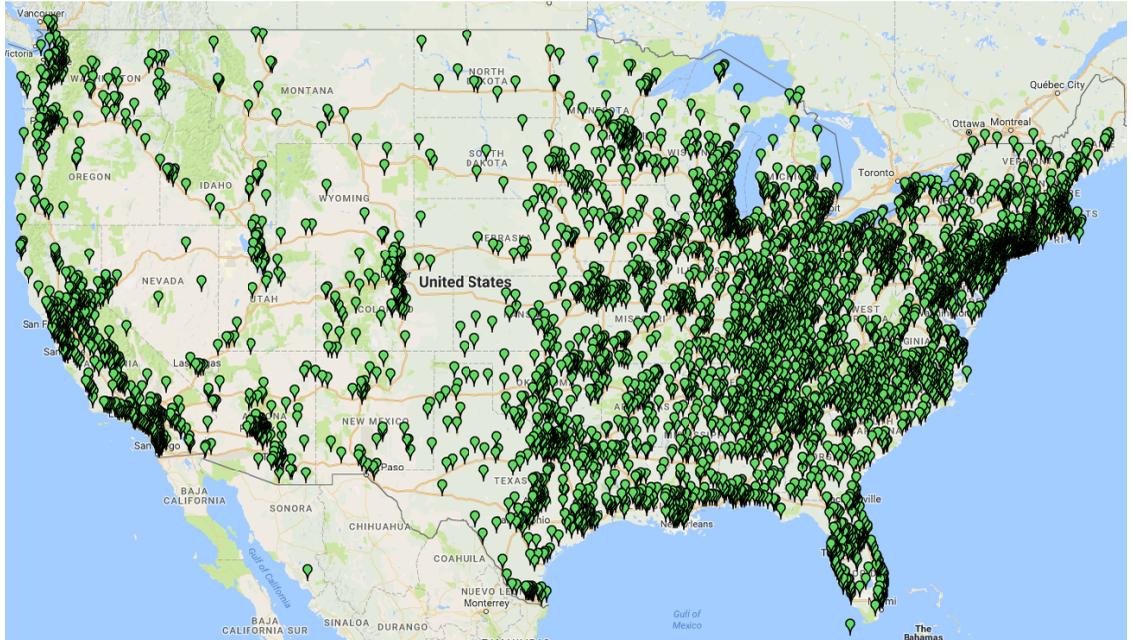
UCMR 4 – Looking for the future potential compounds for drinking water regulation

Andy Eaton, Ph.D., Technical Director, Eurofins Eaton Analytical

Under the Safe Drinking Water Act, every five years USEPA needs to identify a list of up to 30 contaminants that all utilities (~6,000) serving >10,000 population must test for to determine whether there is enough occurrence to consider potential future regulation. Under the Unregulated Contaminant Monitoring Rule (UCMR) program, only UCMR approved laboratories can perform the required testing. Both Eurofins Eaton Analytical (EEA) labs facilities (in Monrovia, CA, and South Bend, IN) were fully approved for all methods in each of the prior UCMR rounds and expect to be fully approved for the fourth round. The final data from the 3rd UCMR round are now available on EPA's website. Eurofins Eaton Analytical, Inc. was responsible for generating over 1/3 of the data from across the country in UCMR 3. The fourth round of this program, (UCMR 4) will kick off in January 2018 and run through December 2020.

The UCMR 4 list of contaminants is eclectic and most reporting limits are in the part per trillion to sub part per billion range, so EPA continues to look at lower and lower levels for potential drinking water contaminants, in part because of health impacts on sensitive sub-populations such as infants.

All surface water systems will need to collect 8 rounds of finished water samples for cyanotoxins (microcystins and anatoxin-a/cylindrospermopsin) using a combination of ELISA and LC/MS/MS methods (EPA methods 546, 545, and 544) during the period of the year most vulnerable to algal blooms. All systems



Locations of all UCMR 4 utilities

(ground water and surface water) will also have to test their finished water for 17 additional chemical contaminants (semivolatiles, alcohols, pesticides, and manganese/germanium) using GC/MS (525.3, 530, 541) and ICP/MS (200.8) methods. For surface waters they will need to perform quarterly tests for one year, and for ground waters they will need to perform semiannual tests for one year. Additionally, any systems subject to the stage 2 Disinfection/Disinfection Byproduct Rule will need to test for all 9 Haloacetic acids (HAA9) by EPA method 552.3 or 557 at each of their distribution system compliance monitoring points either semiannually (ground water systems) or quarterly (surface water systems) for one year. To make it a bit more complex, systems doing HAA9 monitoring must also simultaneously analyze their source waters for TOC and bromide. Laboratories performing UCMR 4 testing must upload results (and all required QC) to a national database for review by EPA and release to the public. By the end of the UCMR 4 monitoring period, EPA will have nearly 40,000 data points for each finished water chemical and over 20,000 data

points for cyanotoxins, providing a robust data set to evaluate occurrence and the potential need for future regulation of these contaminants in drinking water.

So what do we actually expect to find in UCMR 4? For the most part, we will have very few detects, based on historical experience of EEA. We will of course see the haloacetic acids, and expect to see frequent occurrence of at least some of the non-regulated brominated HAAs based on existing EEA data. Manganese, which was included in small systems monitoring in UCMR 3 as a special test suite, will likely be found in many of the finished drinking water samples, even at levels exceeding the secondary MCL of 50 ug/L. Most of the other chemicals are unlikely to be detected in more than a handful of samples (similar to many of the findings with the UCMR 2 chemicals in 2008-2011). The cyanotoxins are a wild card because samples will be collected during periods of vulnerability; but because they are finished water samples and not source waters, the likelihood of frequent detects is minimal. Because EEA expects to be doing a significant percentage of the nationwide monitoring, we will have an early look at detection frequencies for all the UCMR 4 contaminants.

It Takes a Village...

*Dorothy Love,
QA Director,
Eurofins Environ-
ment Testing US*

An African proverb says “It takes a village to raise a child.” This quote has been used a lot over the past two decades to describe the value of community involvement to support the growth and maturation of both the individual and in turn to benefit the community as a whole. To quote Philip B. Crosby, “Quality is the result of a carefully constructed cultural environment. It has to be the fabric of the organization, not part of the fabric.”

These are concepts that I firmly believe in and foster in the businesses that comprise Eurofins

Environment Testing US and Canada. When you work with one of the Eurofins Environment Testing laboratories, you can be assured that there is more than one QA manager supporting each of the businesses. We have a “village” of over 28 QA staff across the Eurofins Environment Testing laboratories. Together we have the experience, knowledge, and commitment to ensure that quality is the fabric of our organization.

Eurofins created the role of the corporate QA Director approximately two years ago as more US (and now Canada) laboratories were acquired in order to foster a unified focus for the design of that fabric. The laboratories that the QA village serves have varied specialties but there are commonalities as well. Every location needs to conduct internal audits. Every location needs to have controlled documents (SOPs, forms, etc.). Every location needs to have a corrective and



preventative action program. Every location needs to work with clients and regulators. So while each location may have a different color for their fabric, our QA staff is working to ensure that the thread that we use to weave it all together is of the same strength and consistency.

Our goals include standardizing the platforms for document control, training record maintenance, and tracking/trending for investigations and audits. We have conducted web meetings to provide training for the staff on these platforms; we have quarterly QA calls to discuss questions or concerns on a variety of topics; we have an email group to easily get a question out to all of the QA staff when you need input on a topic; designated QA members participate in a variety of regulatory committees and meetings and share the information with the group. In addition, we hold an annual meeting of the staff in Colorado where we are able

to retreat from the daily issues that take our attention and focus on how we can improve as a team, share best practices, and simply to put a face to the name so everyone feels that they are part of the village and that we understand and are better prepared to take on our responsibilities.

The Eurofins Environment Testing QA staff has a total of almost 5 centuries of environmental experience from which to pull. The average number of years of experience for the QA staff in environmental work is 18 years. When a QA manager has an issue to deal with or a regulation to interpret, he or she does not need to work alone in this. Our combined experiences and knowledge are there to help each other and, ultimately, to better serve our clients.

In short, you can be assured that while the Eurofins business that you routinely work with may only have one or two QA staff on site, there is a village of support, and centuries of knowledge, with them.

GC/MS SIM vs Scan Mode

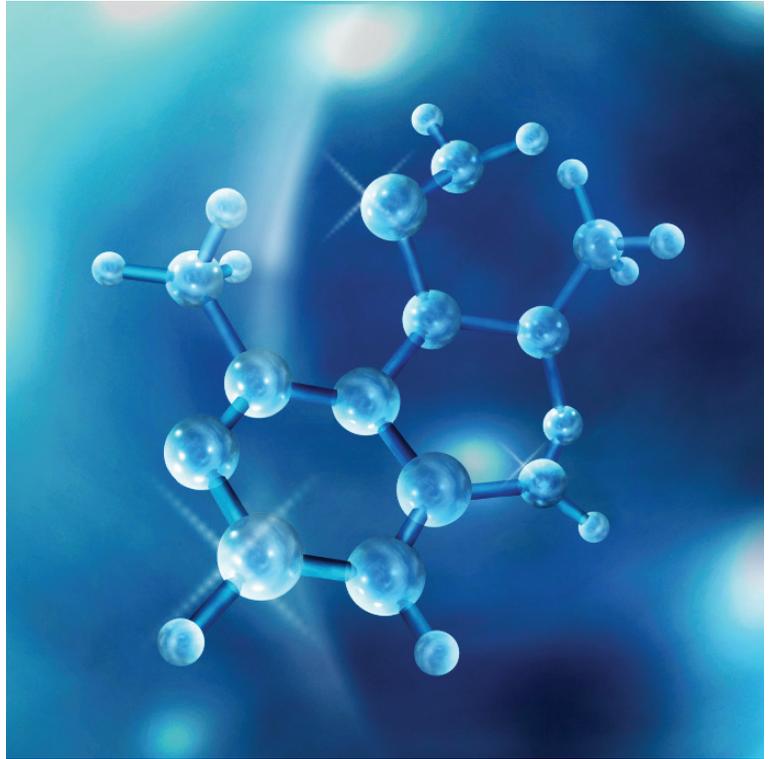
Kim Banks, Director of Business Development, Eurofins Calscience, Inc.

Mass Spectrometry (MS) is an extremely useful identification technique commonly used in series with a Gas Chromatograph (GC). As compounds elute from the GC column, they enter the mass spectrometer where they are bombarded by a stream of electrons which eject electrons from the molecules of target compounds to produce positive ions. These ions then fragment in ways that are very specific to the individual compound and are sorted based on their mass-to-charge ratio (m/z). A typical mass scan range will cover from 35-500 m/z four times per second and will detect compound fragments within that range over a set time period. The specificity of the pattern of the mass spectrum generated upon ionization of an analyte allows for identification through the use of computer libraries containing mass-spectra of many different compounds to compare to the unknown analyte spectrum. Full spectrum range scanning (Full Scan) mode, which records the entire mass spectrum, is the standard mode for analysis of most environmental samples utilizing GC/MS methods such as EPA 8260, 8270, and TO-15.

An alternate GC/MS mode commonly used in the environmental laboratory to

achieve lower reporting limits is Selective Ion Monitoring (SIM). In SIM mode, the instrument is set to only gather data for ion masses corresponding to analytes of interest. The ability to focus the instrument

on the compounds that possess the selected mass fragments, in combination with increased dwell time which lowers the signal-to-noise ratio, results in significantly increased sensitivity and lower reporting limits. The GC/MS operated in SIM mode will allow for reporting limits of 5 to 50 times lower than standard full scan mode. SIM mode can also help eliminate some matrix interferences as the unwanted ions are selectively filtered out. SIM mode is typically used for selected analytes found in EPA methods 8260, 8270, and TO-15. Common target lists include 1,4-Dioxane, PAHs, and TCE, PCE and daughter products, but the instrument can be set to select any analytes found in each method.



The use of SIM is a very useful tool for providing lower reporting limits but it does have limitations.

- The laboratory must perform Method Detection Limit studies in SIM mode so the laboratory cannot randomly choose to use SIM mode to lower reporting limits.
- In order to be useful, the associated ions must be abundant (easy to detect at low concentration), such as Polynuclear Aromatics Hydrocarbons and 1-4 Dioxane.
- Ions that are very unique (low abundance) do not respond well to SIM as they may not be distinguishable from baseline noise at low concentrations.
- While SIM mode may help eliminate some interference, it cannot overcome high concentrations of target and non-target analytes.
- There is a lower degree of confidence in the qualitative identification, although this is overcome for USEPA target compounds by using secondary ions for SIM and comparing their relative intensities to the primary ion, as well as by matching retention times to that of standards.

Example Reporting Limits:

PAHs - 8270	Full Scan Mode	SIM Mode
Water (ug/L)	10	0.2
Soil (ug/kg)	50	10

VOCs - TO-15	Full Scan Mode	SIM Mode
Vapor (ppb (v/v))	0.5-10	0.01-0.025

For more information, visit: EurofinsUS.com/Calscience

We believe that our people provide our strength. Their dedication to quality, professional competence and hard work are the key elements in the company's success. In this regular feature, we introduce you to some of the people who have helped make our lab an industry leader.

Elizabeth Winger began her career with Calscience in 2011 as the Air Program Director. While she had been looking for a company with a good corporate culture, unbeknownst to her at the time, Calscience owners were recruiting her with bigger plans to groom and promote her to President. And it turned out to be a mutually beneficial great fit. "I came to Calscience because it had a family environment with a lot of long-term dedicated employees invested in the success of the business," says Elizabeth. "And with the acquisition by Eurofins Scientific in 2014, Eurofins Calscience has maintained this atmosphere of camaraderie and has benefitted greatly having the support of a laboratory-focused parent company."

What does your current job entail?

My job as President of Eurofins Calscience entails every aspect of the lab and everyone who works here. It includes profitability, safety, operations, sales & marketing and a lot of customer service. But mostly I believe that it is my job to ensure that great decisions are made on a daily basis by all and that everyone goes home each night proud of the work they did and glad to be part of such a dedicated team.

What is the scope of your group?

Eurofins Calscience is an industry leader in the environmental and marine chemistry laboratory testing field. We offer a comprehensive portfolio of analytical methods, and our analytical expertise encompasses all envi-

People are the chemistry



*Elizabeth Winger, President,
Eurofins Calscience*



ronmental matrices including, air, groundwater, sea water, sediment, soil, solid waste, stormwater, tissue and wastewater. We are a customer focused organization. Through the quality of our service and the loyalty of our clients, Eurofins Calscience has grown to become one of the largest environmental testing laboratories in the Western United States.

Why should clients trust us with their projects?

Eurofins Calscience's clients should trust us with their projects because

we are great chemists, but more than that, we are great people who care. Eurofins Calscience has a dedicated team of individuals working together to build upon the successes of the last 30 years. And from this dedication has come our motto: **The difference is service.**

What kind of volunteer activities have you been involved with?

I am a big believer in giving back to the community, and I started my volunteering at a Hospital in the Presidio in San Francisco when I was in High School. After that I spent many years at my children's schools volunteering in a variety of ways, from food drives, scouts, to the annual science fair. During this time I was also involved with a local non-profit organization helping with their grant writing. Additionally, as a family, we were volunteers for many beach cleanups as members of the Surfrider Foundation.

And when you're not working?

When I'm not working, I enjoy my family, travel, gardening, and reading. Combining family and travel is the greatest joy of all. From an early age, it was my goal to visit all 50 states in the US. In doing this I also enjoyed the many wonders of our national parks, and have continued this tradition with my children; we are always looking to check off a new state or national park from our list. Additionally, my daughter spent some of her undergraduate years at Cambridge University and some of her graduate years at the University of Edinburgh, so these years were filled with travel throughout Western Europe. But I still have one big item on my bucket list which has eluded me, seeing the Aurora Borealis. So my big question in life right now, where is the best viewing location?

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Eurofins Frontier Global Sciences—Measuring Hg Species In Waters For Determining Compliance, Toxicity, And Treatability

Measuring Low-Level Total Mercury in ambient waters, wastewater and other aqueous industrial matrices is often required for showing compliance with most discharge permits. However, Total Hg offers limited information when needing to understand toxicity, risk or treatability. Eurofins Frontier Global Sciences offers mercury speciation measurements in receiving waters, waste waters, and aqueous industrial samples that can aid Risk Assessors, Wastewater Engineers and Environmental Compliance Managers (see chart).

Hg Method	Hg Species Measured
EPA 1631	Total Hg (Unfiltered)
EPA 1631	Dissolved Hg (Filtered)
EPA 1631	Particulate Bound Hg (Total Hg – Dissolved)
EPA 1630	Methyl Mercury
EPA 1630 mod	Di-Methyl Mercury
EPA 1630 mod	Ethyl Mercury
EPA 1631 mod	Elemental Mercury
EPA 1631 mod	Ionic Mercury

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