The American Institute of Professional Geologists

Presents

PFAS: Beyond the Theoretical and What's Working

February 27, 2020 - Madison, Wisconsin

Thank You Sponsors and Exhibitors for Supporting the Seminar!!

Networking Reception Sponsors

Lunch Sponsors

Registration Table Sponsor

Breakfast Sponsors

Morning Break Sponsor

Afternoon Break Sponsors

Student Sponsors

AIPG WI Section

Exhibitors

In-Kind Sponsors

Schedule

7:00 am - 8:00 am	**Seminar Registration and Breakfast Networking** Sponsored by Orin Technologies, Wood, and MSA Professional Services
8:00 am - 8:15 am	**Themes and Goals for Seminar** John Osborne, GZA
8:15 am - 8:45 am	**Regulatory Update** Bridget B. Kelly, WI DNR
8:45 am - 9:15 am	**Evolving Perspectives on Exposure and Risk** Christy Barlow, Ph.D., GZA
9:15 am - 9:30 am	**Networking Break** Sponsored by Orin Technologies
9:30 am - 10:00 am	**Fate, Transport, and Forensic Analyses: What Does My Data Tell Me** Jeff Tracy, Geosyntec Consultants, Inc.
10:00 am - 10:30 am	**Analytical Methods and Data Validation: Caveat Emptor** Mark Westra, GZA
10:30 am - 11:00 am	**PFAS Implications and Perspectives in Due Diligence and Real Property Transactions** Edward B. Witte, Esq., Godfrey & Kahn, S.C.
11:00 am - 11:30 am	**Statewide PFAS Sampling of Wastewater Treatment Plants in Michigan: Results and Implications for Industry** Dorin Bogdan, AECOM
11:30 am - 1:00 pm	**Lunch with Keynote Speaker** Sponsored by AECOM, Vista Analytical Laboratory, and GZA **Emerging Compounds from an Air Perspective – A Case Study of Atmospheric Deposition of PFAS/GenX** Mike Abraczinskas, Director North Carolina Department of Environmental Quality-Division of Air Quality
1:15 pm - 1:45 pm	**Conceptual Site Model for PFAS at the Nine Springs Wastewater Treatment Plant** Martin Griffin, Madison Metropolitan Sewerage District; Mike Ursin, TRC

Schedule

1:45 pm - 2:15 pm	**Advances in Colloidal Activated Carbon for PFAS Management** Ryan Moore, Regenesis
2:15 pm - 2:45 pm	**Networking Break and Exhibitor Introductions**
2:45 pm - 3:15 pm	**The Promise and Pitfalls of In-situ Carbon Immobilization of PFAS** Len Mankowski, Wood Environment & Infrastructure Solutions
3:15 pm - 3:45 pm	**Developing a Robust Fate and Transport Model - Case Study** John M. Cuthbertson, AECOM
3:45 pm - 4:15 pm	**Programmatic Approach to Management of PFAS: Using Risk-based Prioritization to Understand Liabilities** Shalene Thomas, Wood Technical Consulting Services
4:15 pm - 4:30 pm	**Networking Break** Sponsored by Eurofins TestAmerica, Geosyntec Consultants, and Godfrey & Kahn S.C.
4:30 pm - 5:15 pm	**Closing Expert Panel Discussion and Concluding Remarks** • John M. Cuthbertson, PFAS Lead, AECOM • Christine Haag, Program Director, WDNR • Taryn McKnight, Product Manager, Eurofins TestAmerica • John Osborne, Principal Hydrogeologist, GZA • Edward B. Witte, Esq., Godfrey & Kahn • Sara Yang, Toxicologist, Wisconsin Department of Health
5:30 pm - 6:30 pm	**Student Poster Presentation and Social Networking Reception** (cash bar) Students Sponsored by AIPG WI Section and Orin Technologies Social Networking Reception Sponsored by Clean Harbors and Wood

Presenters

Mike Abraczinskas

Mike Abraczinskas is currently the Director of the North Carolina Division of Air Quality (DAQ). Mike has 21+ years of diverse experience in air quality (over 20 with DAQ). Mike has been the Director of DAQ since March 2017.

He graduated from North Carolina State University with a B.S. in Meteorology and a Minor in Environmental Science. Also, Mike is certified as an Engineer-In-Training (EIT) and is a graduate of the North Carolina Public Managers Program.

Mike is currently serving in leadership positions of several regional organizations comprised of State and Local Air Quality Agencies:

- Past Chairman for the Southeastern States Air Resource Managers (SESARM)
- Chairman of the Mid-Atlantic Regional Air Management Association (MARAMA)
- Board member of the Carolinas Air Pollution Control Association (CAPCA)

Additionally, Mike is actively involved in the activities of the Association of Air Pollution Control Agencies (AAPCA).

_____

Christy A. Barlow

Dr. Christy Barlow is a toxicologist that specializes in occupational toxicology, quantitative exposure reconstruction, and human health risk assessment. She earned a B.S. in Biology from Eckerd College and a Ph.D. in Cell and Molecular Biology from the University of Vermont. More recently, she has been involved in researching, reconstructing dose and exposure, and assessing risk to consumers, communities, and workers exposed to a variety of chemical and biological materials. Her experience includes investigating the health effects of exposure to a variety of compounds, including particles and fibers, volatile organic compounds, chlorinated solvents, poly- and perfluoroalkyl substances (PFAS), and biological agents.

_____

Dorin Bogdan

Dr. Bogdan is an AECOM PFAS technical expert and has authored many technical papers for national conferences on this topic. Dr. Bogdan is an environmental engineer with over 11 years of experience in soil, sediments, and groundwater remediation, innovative technologies, and hazardous waste. Dr. Bogdan's has worked on dozens of PFAS projects, applying his depth of experience to the unique challenges associated with analytical testing and methodologies, environmental fate and transport, site characterization, conceptual site models, bioaccumulation in the food webs, regulatory negotiation, and remedial technologies.

_____

_____

_____

_____

Presenters

John M. Cuthbertson

John Cuthbertson serves as AECOM's North America Industrial and Oil & Gas PFAS Lead and Central Region PFAS Practice Lead. He has over 28 years of environmental consulting experience supporting oil and gas, chemical, and industrial clients. Mr. Cuthbertson primary focus during the past four years has been PFAS and during this time has managed dozens of projects across North America involving various PFAS constituents and is experienced in analytical testing and methodologies, environmental fate and transport, assessment and investigation, and treatment technologies. Mr. Cuthbertson offers a compelling synergy of technical expertise, regulatory knowledge, and negotiating experience that facilitates development of sound strategies for site characterization, remediation, and closure effectively balancing risk, exposure, and cost.

_____

Martin Griffin

Martin Griffin, PE, Director of Ecosystem Services, Madison Metropolitan Sewerage District Martye has always been about the 'WE' in 'WATER' and how human decisions impact water quality. He received his graduate degree in biology examining the impacts of excess nutrients on coastal ecosystems at the Marine Biological Laboratory in Woods Hole, Massachusetts, and has over 20 years of experience working in the public and private sector looking holistically at the interaction between human land use and water quality. With increasing societal and regulatory pressure to produce cleaner water than ever, It costs more to clean water after it is polluted than preventing the pollution in the first place. Martye focuses on solving problems adaptively as a way to "move at the speed of trust" and is just the way we have to do business.

_____

Christine Haag

Christine Haag is the director of Wisconsin DNR's Remediation and Redevelopment Program. Christine started with the RR program in February 2013 as the administrator of the Ready for Reuse loan and grant program. In December 2014, she became the brownfields and outreach section chief. She became the RR program director in April 2019.

Prior to joining DNR, Christine spent six years as the vice-president of real estate for a fast-casual restaurant entrepreneur and president for a start-up confections company. In the first 11 years of her career, Christine worked for a non-profit conservation organization including eight as executive director. Christine served on the board of directors of the American Hiking Society for five years and was a member of the Dane County Park Commission for 11 years.

Christine has a B.A. in Anthropology from UW–Milwaukee and a M.S. in Urban and Regional Planning from UW–Madison.

_____

_____

_____

_____

Presenters

Bridget B. Kelly

Bridget Kelly is the Emerging Contaminant Program Coordinator at the Wisconsin Department of Natural Resources. Previously, Bridget served as DNR's Water Program Lead and Copper Rule Coordinator from August 2016 to April 2019. Prior to joining DNR, Bridget spent four years as Geologist and Land Asset Manager for Red Flint Group, LLC in Eau, Claire, Wisconsin and as an Associate Lecturer at the University of Wisconsin-Eau Claire from August 2011 to August 2012. Bridget has a B.S. in Geology from University of Wisconsin-Eau Claire and a M.S in Hydrogeology from the University of Nebraska-Lincoln.

Len Mankowski

Len Mankowski is a Senior Geologist at Wood Environment & Infrastructure Solutions (Wood) with over 14 years of hydrogeologic characterization and remediation experience at contaminated Sites across Michigan and the Midwest. His primary areas of expertise include: innovative remedial investigation techniques; hydrogeologic and conceptual site model development; risk characterization; and conceptual remedial design/technology assessments. Mr. Mankowski earned a Bachelor of Science degree in applied geophysics in 1999 and a Master of Science in Geology in 2003 from Michigan Technological University, where he also worked as an instructor prior to entering consulting. Mr. Mankowski has published and/or presented several papers on innovative characterization and remediation approaches applied at Sites in Michigan (including the Wickes TCE Plume). Mr. Mankowski lives near Suttons Bay, Michigan and is also a board member, coordinator and coach for the Leelanau County youth soccer program.

Taryn McKnight

Taryn McKnight, Product Manager for Eurofins TestAmerica, based in Sacramento, California, has more than 15 years of experience in the environmental testing industry specializing in PFAS and Vapor Intrusion assessments. She is responsible for providing technical guidance to clients, agencies and industry personnel across the country. With 20 years invested in PFAS method development and analysis, Eurofins TestAmerica has demonstrated expertise in this field of testing, supporting an analytical approach that provides consistent and defensible data in a world that lacks standardization for PFAS methodologies. Eurofins offers the nation's largest LCMSMS capacity dedicated to PFAS, with an ever expanding list of PFAS compounds at detection limits well below current state and federal screening levels.

Ryan Moore

Ryan Moore has more than 19 years of experience as an environmental project manager and laboratory account executive relating to multimedia contamination sites throughout the U.S. His experience focused on in situ groundwater and soil treatment, site investigations, corrective action evaluations, operation & maintenance of remediation systems, large soil removal remedial projects, vapor intrusion assessments, and environmental laboratory operations, and business development. He has also presented at multiple conferences on in-situ remediation including events hosted by Battelle, AIPG, and other environmental associations. Ryan holds a B.S. of Environmental Studies from Manchester College, North Manchester, IN.

Presenters

John Osborne

John Osborne is a Principal Hydrogeologist and Senior Vice President with the Boston-Based Consulting firm of GZA. He received his Bachelor of Science and Master of Science degrees in Geological Sciences and Geophysics from the University of Wisconsin-Milwaukee. John has managed and directed a large diversity of hydrogeologic, environmental, geotechnical and groundwater resource projects implemented by teams of engineers and scientists at GZA. He has taken active roles in representing clients and negotiating technical issues with the USEPA, the Department of Justice, the Wisconsin DNR and many other state regulatory agencies. His areas of specialization have included geological and hydrogeological site characterization and development of conceptual site models (CSMs) used in unraveling the complexities of contaminant migration and the selection of remedial solutions that balance both risk and cost. While based in Wisconsin, John has responsibility for GZA's operations throughout the Great Lake's states.

Shalene Thomas

Ms. Shalene Thomas, PMP, is the Emerging Contaminant Program Manager for Wood. She has more than 20 years of experience in environmental consulting that includes 11 years of experience supporting per- and polyfluoroalkyl substance (PFAS) evaluations. She has extensive program and project management, human health risk assessment, data management, GIS and 3D visualization and animation experience and has supported State, Federal and industrial clients with PFAS evaluations. She serves as Wood's PFAS Work Group Lead and has supported PFAS projects in 32 different states in 9 of the 10 USEPA regions as well as in Australia and Canada.

Jeff Tracy

Jeff Tracy is a Licensed Professional Geologist in Wisconsin with over 25 years of experience in soil and groundwater quality investigation, remedial action plan development and implementation; environmental project management, primarily in the practice of owner's representation for site and portfolio management; environmental due diligence; spill response and management; demolition planning and management; and brownfields redevelopment. Jeff's primary experience is remediating petroleum and chlorinated compound contaminated media at former and operating manufacturing facilities, Superfund and State-lead sites, and private party sites.

Mike Ursin

Mike Ursin, PG, has spent the last 12 years of his career as an environmental consultant supporting clients in the industrial, commercial, real estate, and government sectors as they navigate environmental issues related to their business operations, including addressing PFAS and other emerging contaminants. His extensive experience includes environmental investigations, remediation, environmental compliance, geotechnical investigations, contaminated material management, NEPA, client and regulatory communication, and building working relationships with clients. Mike is a Wisconsin-licensed Professional Geologist, NR 712.03(1) Hydrogeologist, and is a member of TRC's Emerging Contaminant and Phase I ESA CORE teams.

Presenters

Mark Westra

Mr. Westra is a Principal at GZA GeoEnvironmental, Inc. and the Grand Rapids, Michigan District Office Manager. Mr. Westra focuses his practice on environmental chemistry, most recently relating to PFAS, pre-acquisition and pre-divestment environmental due diligence, and legal support/expert testimony. Mr. Westra leads multiple PFAS-related projects for GZA's clients within the Midwest. His environmental due diligence practice includes compliance with federal and state environmental property transfer laws. Mr. Westra is active on many ASTM International Task Groups related to property transactions and redevelopment. He currently chairs ASTM E50:02 Task Group on PFAS implications pertaining to commercial real estate transactions.

_____

Edward B. Witte

Edward (Ned) B. Witte is a shareholder in the Godfrey & Kahn Environmental Strategies Practice Group. Ned has extensive experience in environmental due diligence and liability allocation in business transactions, defense enforcement actions and pursuing environmental contractual rights against third parties, the development and redevelopment of contaminated properties, including Brownfields, and coordinating Superfund site response activities. Ned frequently writes and speaks concerning Per-and Polyfluoroalkyl substances, or PFAS. Ned represents clients at several PFAS sites in Wisconsin (as identified on Wisconsin's BRRTS database). Ned Witte was the 2016 Best Lawyers® Environmental Law "Lawyer of the Year" in Milwaukee.

_____

Sara Yang

Dr. Sarah Yang is the Groundwater Toxicologist with the Wisconsin Department of Health Services. Her job duties include developing recommendations for groundwater standards, conducting human health risk assessment activities and conducting toxicological surveillance activities relating to health outcomes and chemical exposures. Sarah started at DHS in October 2017. Before that, she was an environmental toxicologist in the Water Quality Bureau for the Wisconsin Department of Natural Resources. Her work at DNR focused on policy development related to water quality standards. Sarah holds a Doctoral degree in Molecular and Environmental Toxicology from the University of Wisconsin – Madison.

_____

_____

_____

_____

_____

_____

_____

Poster Presenters

Comparison of Per- and Polyfluoroalkyl Substances (PFAS) in Biosolid and Biochar for the Remediation Application

Caroline Rose Alukkal, Purdue University, PhD Scholar, West Lafayette, IN

The conventional wastewater treatment systems result in the selective partitioning of PFAS into biosolids. Due to the nutrient-rich organic composition of biosolids, they are increasingly land applied in urban and suburban settings in order to enhance soil quality and plant growth, but also as a method of waste handling and carbon storage. However, research in the past few decades has shown that biosolids are acting as a secondary source of many contaminants of emerging concern, including PFAS. This study is a comparison of PFAS in biosolid and the corresponding pyrolyzed product. The release potential of PFAS from biosolid and biochar is also compared in order to enable the quantification of possessed environmental risk. The inertness of the material along with the comparable plant growth enhancement property as that of biosolids proposes the biochar as a potential candidate for PFAS remediation through sorption. This technology has added advantages of long term sequestration of carbon and easing the handling of millions of tons of biosolids generated in the United States every year.

Caroline Rose Alukkal is a Ph.D scholar at Purdue University with research centered on the quantification and remediation of PFAS. She has gained a Bachelor's Degree in Biotechnology Engineering and Master's Degree in Environmental Science and Engineering. She is actively involved in the research on remediation technologies from the Under-Graduate studies. She loves learning new technologies and taking up the challenges as they result in creative practical solutions. Her happiness lies in the conservation of environment innovatively but simple.

Aquatic Chemistry at UW-Madison: Fate and Transformation of Organic Contaminants

Sarah Balgooyen, Ph.D, Remucal Research Group, University of Wisconsin-Madison, Madison, WI

The Remucal research group investigates processes that degrade organic contaminants in natural and engineered systems. Organic contaminants, such as pesticides, pharmaceuticals, industrial chemicals, enter the environment through stormwater, runoff, and wastewater. These compounds may degrade in the environment via photochemical reactions (reaction with sunlight), microbial processes, or oxidation via naturally occurring minerals. Certain compounds like PFAS (per- and polyfluoroalkyl substances) do not have any known degradation pathways, and therefore pose a serious concern to human and environmental health. In engineered systems, processes are designed to remove certain organic contaminants. In the Remucal research group, we study how these organic contaminants behave in the environment and their potential treatment processes.

Specific research projects vary widely in the Remucal group. Some projects are localized in Wisconsin, such as the investigation of PFAS contamination from a fire products facility in Marinette, WI; the use of herbicide 2, 4-dichlorophenoxyacetic acid (2, 4-D) on lakes across Wisconsin to remove Eurasian Watermilfoil; and the application of lampricides to tributaries of Lake Michigan to reduce populations of the invasive sea lamprey. Other research projects involve treatment of contaminants that can be applied more generally. These projects include the alterations to traditional chlorination treatments in drinking water facilities and reduction of harmful disinfection byproducts that are formed in water treatment; photochemical degradation of pharmaceuticals in natural waters; and removal of phenolic contaminants by oxidative degradation, which may be used to treat contaminated stormwater runoff.

Poster Presenters

Sarah Balgooyen is a postdoctoral researcher at the University of Wisconsin-Madison studying contamination of PFAS (per- and polyfluoroalkyl substances) in the Great Lakes region, specifically in tributaries of Green Bay. Sarah has a PhD in Environmental Chemistry and Technology from UW-Madison (2019) and a BS in Chemistry from Michigan State University (2013). Before coming to Madison, she worked at Proto Manufacturing in Detroit specializing in X-ray analytical techniques. Sarah enjoys mountain biking and a variety of winter sports.

Monitoring Hydrologic Controls on
Biogeochemical Process Variability in Green Infrastructure Soils

Laine Pulvermacher, MS Student, Dept of Civil, Construction & Environmental Engineering, Marquette University, Milwaukee, WI

Green stormwater infrastructure (GSI) is being promoted in urban areas to both capture and remove nutrients from stormwater. Biogeochemical and physical processes in the soils are responsible for the removal of nutrients in these systems. Prior research on GSI ability to capture and remove incoming nutrients showed that this ability is variable between sites and individual storms. The majority of research into the variability of GSI nutrient removal has been based on inflow and outflow water sampling methods. Yet, it has not been established the soil biogeochemical contributions to nutrient removal. In this thesis work, we monitor the stoichiometry of soil respiration (called the apparent respiratory quotient, ARQ) within different GSIs in Milwaukee at a high frequency to investigate biogeochemical processes, their response to soil conditions, and spatial and temporal variability. Secondly, we use a reactive transport model to disaggregate physical and biogeochemical controls on the observed ARQ, which are not clear from the measurements alone. We identified controlling factors of ARQ within the soils and the implications of ARQ spatial and temporal variability for the biogeochemical processes that may contribute to nutrient removal in GSI soils. These findings can assist in the management of stormwater nutrients as well as GSI design.

An Investigation of Industrial PFAS Use: Site Identification and Company Survey

Katie Schulz, Graduate Research Assistant, University of Wisconsin-Milwaukee School of Freshwater Sciences, WEP Research Assistant, Milwaukee, WI

As concern regarding PFAS continues to grow, it is important to identify and fill gaps in knowledge about these chemicals. This project seeks to learn more about industrial use of PFAS by identifying relevant industries that use PFAS and determining their presence in Wisconsin in order to prioritize future testing.

Katie is a Masters' Thesis student at the University of Wisconsin-Milwaukee's School of Freshwater Sciences. The focus of her research is on PFAS in Wisconsin, first examining general contamination and moving this year into the implications of applying contaminated biosolids to soil. She completed her undergraduate degree in ecology at New York University before returning to her hometown of Milwaukee to pursue a masters' degree.

Thank You for attending! Safe travels home!

Thank You to our Exhibitors and Sponsors!!

Sponsors

- AECOM
- Clean Harbors Environmental Services
- ORIN Technologies
- GZA GeoEnvironmental, Inc.
- Wood.
- Vista Analytical Laboratory
- Eurofins TestAmerica
- Geosyntec Consultants
- Godfrey & Kahn S.C.
- MSA Professional Services
- WI AIPG Section

Exhibitors

- Vista Analytical Laboratory
- Eurofins TestAmerica
- Pace Analytical
- Clean Harbors Environmental Services
- Purolite Corporation
- GEL Laboratories
- SGS North America
- Regenesis Remediation
- GZA GeoEnvironmental, Inc.
- Orin Technologies
- Oneida Total Integrated Enterprises
- US Ecology
- Ramboll
- Water Surplus
- Evoqua Water Technologies

In-Kind Sponsors

- WI Geological & Natural History Survey
- WI Rural Water Association
- WI Department of Natural Resources
- WI Department of Health Services
- WI Ground Water Association
- Federation of Environmental Technologists

The American Institute of Professional Geologists (AIPG), founded in 1963, is the largest association dedicated to promoting geology as a profession. It presently has more than 6,800 members in the U.S. and abroad, organized into 36 regional Sections. The Institute adheres to the principles of professional responsibility and public service and is the only international organization that certifies the competence and ethical conduct of geological scientists in all branches of the science with members employed in industry, government, and academia. AIPG emphasizes competence, integrity and ethics. AIPG is an advocate for the profession and communicates regularly to federal and state legislators and agencies on matters pertaining to the geosciences.