

Speaker and Abstract Information for 2021 Onsite Wastewater Mega-Conference

October 2021

Sergio Abit, Oklahoma State University

Using Modeling to Assess Septic System Regulations

Presentation without a paper, 25 minutes

Abstract:

Approximately 79% of households in the United States use the public sewer system provided by their city's infrastructure. However, this leaves a significant portion of homes needing to use other means for properly discarding their wastewater. Roughly 19% of homes in the U.S. depend on onsite wastewater treatment systems (OWTS) for the treatment and disposal of domestic waste. In Oklahoma, upwards of 40% of single-family homes rely on OWTS for effluent removal. This study focused on assessing, the appropriateness of current regulations for the sizing of on-site wastewater treatment systems for conventional septic systems across a large climate gradient. This study aims to determine the optimum subsurface absorption sizes for different soil groups under various precipitation regimes across Oklahoma's climate divisions. Hydrus 1D was used to model water flow through uniform, homogenous soil profiles. The pressure head at the node directly above the bottom of the trench was used to indicate viable sizing requirements. If the pressure head reached zero or above, it would indicate ponding or septic system backflow. Preliminary results indicate current sizing requirements are viable, and adjustments to reduce the drainage field sizes may be feasible in some locations.

Bio:

Dr. Sergio Abit is the State Specialist for onsite wastewater treatment systems in the State of Oklahoma. He got his Masters and Doctoral degrees in Soil Science at the North Carolina State University where he specialized in environmental soil physics and hydrogeology. He has conducted research and published scientific articles concerning the fates on nitrogen, phosphorus and bacteria in soil systems. As a State Specialist, he oversees the state-wide extension effort geared towards addressing the training and educational needs of various stakeholder groups in the onsite wastewater industry and organizes the Oklahoma's annual onsite wastewater conference. He is also a faculty member of the Department of Plant and Soil Sciences at the Oklahoma State University where he teaches various undergraduate- and graduate-level soil science courses. Dr. Abit also serves as a member of the Board of Directors of the National Onsite Wastewater Association.

+++++

Robert Bair, University of South Florida

NEWgeneratorTM: Field Tests of an Off-grid Non-Sewered Sanitation System for developing countries and remote locations

Presentation without a paper, 25 minutes

Abstract:

Centralized sanitation infrastructure requires costly sewers and treatment plants which are difficult to sustain in developing countries. Non-sewered sanitation systems (NSSS), which are advanced onsite treatment systems, are a promising alternative to centralized treatment. The NEWgenerator™ (NG) is an automated and compact NSSS that was designed by the University of South Florida to address the unique challenges presented in developing countries and remote locations. The NG uses an anaerobic membrane bioreactor (AnMBR) to degrade contaminants in wastewater while producing biogas. The entire system operates entirely on solar energy. Because the NG does not require a drain field, it can operate in environments with space limitation, poor drainage, or high groundwater table. Nutrients, such as nitrogen, are recovered with an ion-exchange based Nutrient Capture System. The NG was recently field tested in South Africa for onsite blackwater treatment and non-potable water reuse. During the field trial, the recycled water quality was compared to the recently developed International Organization for Standardization's (ISO) 30500 standard, which specifies thresholds for chemical oxygen demand (COD), total suspended solids, nutrients, and pathogens. The results from the field trial indicate that the NG can effectively produce recycled water meeting stringent requirements. Notably, the NG is able to reduce COD from influent concentrations ranging between 1000-6000 mg/L to less than 150 mg/L.

Bio:

Robert specialized in anaerobic membrane bioreactors for decentralized wastewater treatment. His passion is seeing technological advancements serving the needs of marginalized communities in developing countries. During his PhD work he worked on the NEWgenerator and has served as designer, builder, and operator of the system. He plans to continue improving the system and wants to see the technology commercialized.

+++++

Marie-Christine Belanger, Premier Tech Water and Environment

Comparison of long-term performance of two disinfection approaches

Presentation without a paper, 50 minutes

Abstract:

Chlorination and UV light are currently the most common methods used for disinfection of wastewater. While these processes are generally well-adapted to community or municipal installations, their operation and maintenance needs present some limitations to assure sustainable performance for onsite wastewater treatment applications. In view of these limitations, Premier Tech developed in early 2000, a low maintenance-passive biological disinfection approach (FDi), which consists essentially in a lateral sand filter. Initial results obtained were presented at NOWRA International Conference-2007. This system, certified under BNQ standard 3680-910 in 2009, is submitted to an annual filed performance audit as per BNQ standard requirements. Now more than 10 years later, enough audit data are collected from the field to analyze and compare the performance of two certified disinfection systems: FDi and UV lamp. These two systems are installed after an Ecoflo biofilter. The data studied come both from certification tests and from data collected during annual audit campaigns, all carried

out by the BNQ. The analysis is performed using different statistical tools. Although the results obtained for the FDi as compared to the UV systems during the certification reveal greater variability, the annual field performance audits confirm the greater robustness of the FDi with a 94.6% compliance with the regulatory threshold and only 70% for the UV, which highlights the importance of regular mail.

Bio:

Marie-Christine Bélanger is the current Product Director and Government Relations at Premier Tech Water and Environment (PTWE), a Canadian company and world leader in the Onsite Wastewater Treatment industry. She accumulated over five years of professional experience as a Project Manager for the development and implementation of decentralized wastewater treatment systems for GSI Environment before pursuing a career as Project Development Director at Group Celdex, a firm specializing in the development of integrated Waste Management programs in emerging countries. Ms. Bélanger joined PTA in 2002. Her functions at PTWE have brought her to play key roles on several steering and advisory committees throughout North America, namely with the BNQ, CSA, NOWRA, NSF, local provincial and state organizations, etc. where she has taken part in the development and advancement of industry-wide regulations and standards leading to better protection of the environment and the public's health. Ms. Bélanger holds a Physics Engineering degree from Laval University and a Master's degree in Chemical Engineering from L'École Polytechnique de Montreal.

+++++

Allison Blodig, Infiltrator Water Technologies

Understanding RV and Camper Wastewater Streams

Presentation without a paper, 50 minutes

Abstract:

RV parks produce a unique high strength wastewater stream with water conservation playing a large part in producing the concentrated wastewater. This presentation reviews the structure and function of the water and wastewater system in and RV and what it takes to break down the wastewater.

Bio:

Allison has been in the onsite wastewater treatment industry since 1997, first as a regulatory official and then in the wastewater treatment manufacturing industry. Currently she is an Engineered Systems Consultant with Infiltrator Water Technologies a leading developer of decentralized wastewater treatment technology. Along with a degree in Biology from Benedictine College in Atchison, KS, she has been a Registered Environmental Health Specialist and member of the National Environmental Health Association since 1996. She is the current treasurer for the Kansas Environmental Health Association (KEHA) and is also very active with the National Onsite Wastewater Recycling Association (NOWRA). She is the current Vice President for the organization as well as a former chair of the Technical Practices and the Conference Committees. Allison was the 2017 recipient of the Raymond Peat Lifetime Achievement award for outstanding achievement in the Kansas onsite wastewater field.

+++++

Gabriele Bonaiti, Texas A&M AgriLife Extension

Onsite wastewater research program at the Texas A&M University: Low Pressure Dosing research

Presentation with a paper, 50 minutes

Abstract:

Low pressure dosing (LPD) systems offer an alternative to standard gravity or pumped drain field systems, thanks to uniform distribution of effluent, dosing and resting of the soil treatment area, and shallow placement of trenches to enhance aeration. In Texas, LPD systems are required to be installed according to design criteria in the North Carolina State University Sea Grant College Publication UNC-S82-03 or other publications. The Texas Commission on Environmental Quality indicated the need for local research to determine if design can be improved. The Texas A&M University’s On-Site Sewage Facility Team designed and installed a field research experiment in December 2020. A standard septic tank was used for treatment of raw wastewater and three field distribution configurations were compared: Conventional trenches with holes in laterals facing down in gravel; Trenches with holes facing up and protected by orifice shields in gravel; Trenches with holes facing up and protected by leaching chambers. The Team also designed and distributed a survey to identify problems reported by regulators, owners, and designers of LPD systems in Texas. This paper will report field experiment description, including site characteristics, design features, and monitoring instrumentation (water level, laterals pressure, soil moisture); will discuss field preliminary results and experienced challenges; and will present survey design and input obtained from participants.

Bio:

Dr. Gabriele Bonaiti is an Extension Program Specialist and has been employed by Texas A&M AgriLife Extension since February 2009. During this time, he has developed and implemented educational programs for water districts focusing on water conservation and efficiency through irrigation scheduling, identification of head and seepage issues in open canals, soil water balance and quality modeling, data management, and use of Geographic Information Systems. He is currently supporting Texas Commission on Environmental Quality’s - Coastal Zone Act Reauthorization Amendment projects by developing and implementing methodologies for building an inventory of On-Site Sewage Facility systems along the Texas coastal zone, the Lampasas River Watershed, and the Hidalgo and Cameron Counties. Programs are delivered through educational material, training, field demonstrations, project reports, and web-based tools. He is currently leading one of the research projects funded through the first round of TOGP related to evaluation of LPD systems using two alternative and one conventional design standards.

+++++

Michael Broussard, New Mexico Envi Dept

Septic Tank Design Review and Inspection

Presentation without a paper, 50 minutes

Abstract:

Septic tanks (plastic and precast) are the heart of the onsite system. They are the beginning of all treatment trains and represent a significant system cost. The tank survivability and functionality are significant factors contributing to the systems proper performance. Poorly or improperly designed units and the corrosive environment can lead to premature structural integrity failures. Additionally, substandard materials contribute to structural instability and catastrophic failures resulting in serious injuries and deaths. The author believes that proper understanding of design requirements, thorough design reviews and more detailed tank installation inspections can alleviate these issues. Improvements in this area can contribute to greater lifetime and performance for all onsite systems. We will cover specific design requirements and terminology related to the most often overlooked design features. The presentation will explore material requirements and specifications that are typically ignored. We will also address case studies revealing poor manufacturing practices and how those were addressed. The lack of this specific knowledge among manufacturers, installers and regulators is the root cause of most treatment unit failures. The presentation will cover only those that commonly contribute to non-compliance and lead to failures. Onsite system failures damage the industry reputation reducing consumer confidence.

Bio:

Michael Broussard is a 10 year US Army veteran with a BS in Biochemistry and currently serves as the Acting Liquid Waste Program Manager for the New Mexico Environment Department's Environmental Protection Division. He has worked in the onsite field for 13 years with the environment department. He has 15 years of quality assurance experience in the metal finishing, petroleum, food and pharmaceutical production industries as well as 10 years experience in industrial wastewater pretreatment industry.

+++++

Kate Carney, CPOW and NAWT

NAWT The Beginning Life and Design Principles of Onsite Wastewater Treatment Systems

Presentation without a paper, 25 minutes, 50 minutes

Abstract:

As the first stage in the life cycle of an OWTS, there are many basic principles that can be applied for the Onsite Wastewater System Designer across the country. The specific regulations in any given area give you the allowed “ingredients” for creating an OWTS, but there needs to be a basic understanding of OWTS to complete a design to avoid the “cookbook” mentality of creating an OWTS design. The principles that will be covered in this presentation will discuss the Designers purpose and why they are an important, vital component to lifecycle of an OWTS. We will discuss the umbrella concepts that can be applied for any location regardless of the specific local regulations for OWTS Design. The topics will include site evaluation, soils analysis vs. percolation tests, understanding systems choices that may be available and understanding the system user and their impact on the system. We will also be discussing the need to be more than just a P.E. in the industry. Why a complete and thorough understanding of the wastewater cycle, treatment concerns and issues is vital to the design process. In addition, we will highlight the importance of communication skill with regulators, other professionals in the industry and

the homeowner or end user. The discussion will also include why specific OWTS training, education and certification is important for the Professional Designer.

Bio:

Kate Carney is owner of Church Onsite Wastewater Consultants. LLC. She earned a Bachelor of Science Degree in Biological Sciences from Missouri University of Science and Technology and a Master of Science degree in Environmental Science and Engineering from the Colorado School of Mines. Kate has experience in soil/site evaluations as well as the design and management of residential and commercial on-site wastewater treatment systems. She is a Registered Professional Engineer in Colorado. She has also taught as an adjunct professor at the Colorado School of Mines.

+++++

David Casaletto, Ozarks Water Watch

Using State Revolving Fund (SRF) grants for Failing Onsite Remediation in Arkansas and Missouri

Presentation without a paper, 50 minutes

Abstract:

State Revolving Funds (SRF) have historically been used for grants and loans for municipal wastewater treatment systems. Although allowed by Congress, states seldom allow SRF funds to be used to remediate failing onsite systems. Ozarks Water Watch, a 501(c)3 water quality organization, has been successful in receiving \$2 million in SRF grants from the state of Missouri and \$1 million from the state of Arkansas to repair or replace failing onsite wastewater treatment systems. Once an onsite system has been certified as failing by the local regulatory authority, the homeowner then solicits 3 bids for repair or replacement. Once the system is installed, Ozarks Water Watch will issue a check to the homeowner to pay for the repair or replacement. The funds paid to the homeowner are a combination of grant and loan with the percentage of each determined by the homeowner's income level. Very low-income homeowners can receive up to \$30,000 with 90% coming as a grant. Repayment funds from the loan portion are placed in an interest-bearing account and used as a revolving fund to remediate additional failing systems. To date in Missouri, the original \$2 million SRF grant funds were leveraged to over \$2.75 million in funds spent. In Arkansas, the SRF Septic Remediation program started January 1, 2021 with 5 systems already in progress.

Bio:

David Casaletto is the President of Ozarks Water Watch (OWW), a nonprofit water quality organization formed in 2002 with offices in Kimberling City, MO and Rogers, AR. Ozarks Water Watch's mission is to protect and improve the waters of the Upper White River Basin focusing on Beaver, Table Rock, Taneycomo and Bull Shoals lakes and their watersheds. David's career has focused on efforts to reduce pollution to lakes, rivers and streams from failing onsite systems and small private wastewater treatment plants. David also serves as the President of Ozarks Environmental Services (OES), a nonprofit sewer and water maintenance company, that has 14 professionally trained operators holding various licenses in the operation and maintenance of wastewater treatment systems, water systems and onsite treatment systems. OES operates over 75 drinking water systems and 75 wastewater treatment systems in southwest Missouri and northwest Arkansas plus selling and servicing grinder pumps, maintaining

onsite treatment systems and pumping & hauling septage and sludge. David is also President of Ozarks Clean Water Company (OCWC), a nonprofit sewer and water utility company. OCWC owns and operates over 30 water and wastewater treatment plants (WWTP) that serve over 3,000 connections. David was Program Coordinator for the National Decentralized Onsite Wastewater Demonstration Project at Table Rock Lake from 2002 to 2007, a \$2 Million cooperative agreement with EPA to find technical and management solutions for failing onsite systems at Table Rock Lake. David is a past board member and former executive director of Missouri Small Flows organization."

+++++

Mick Credere, AWP

Leverage Free Google Resources To Grow Your Septic Business

Presentation with a paper, 50 minutes

Abstract:

In today's digital and connected world, more and more consumers and businesses are finding the septic services they need online. As septic and onsite business owners, what resources are you leveraging to make sure that at least locally, you are available to those consumers in need of your services? Are you aware that there are FREE areas of Google, Bing and Yahoo that you can show up to your customers for FREE? Are you taking advantage of those areas to grow your business's bottom line? In this presentation we will focus on understanding how to fully use your business listing on the search engines and take charge of your business listings digitally. We'll end the presentation with a Q&A to clearly cut through misunderstandings about the search engines and how they affect the wastewater industry.

Bio:

With an unexpected background including a political science degree and coming out of the US Marine Corps, Mick Credere translated his knowledge of weapon systems to leap into a successful startup that specialized in marketing for the defense sector working under what is now one of his mentors. With the successful growth and sale of that company, Mick was able to translate the knowledge he gained in digital marketing from the defense sector, to start AWP with the help of a partner and leader in the septic and onsite wastewater industry. Now representing clients in 11 states and across many aspects of the septic industry, AWP has successfully grown into a known brand with Mick Credere. Mick is proud to stand as a disruptive and aggressive leader in the digital marketing space and looks to upend the standard way of doing business. In his free time, Mick is an avid pilot and chauffeur for his children and his wife and daughter's horses.

+++++

Sheryl Ervin, Infiltrator Water Technologies

Source Water Protection and OWWS-Are We Drinking the Same Water as Dinosaurs?

Presentation without a paper, 25 minutes

Abstract:

The water cycle now, as in the time of dinosaurs, is a closed loop; no new water is created, existing water is just recycled over and over again. So yes, the water you drink today may very well have been drunk by a thirsty T-Rex a long time ago. The water cycle is a model of the complex, continuous movement of water within and around Earth, from surface water to clouds to precipitation to groundwater to drinking water to wastewater. The cycle does not end with wastewater, as water molecules continuously move within the cycle, which is why source water protection is critically important for society. This may come in the form of best management practices for watersheds, such as maintaining soil cover and planting buffer strips along streams to protect water. With the onsite wastewater treatment system industry a critical part of the nation's wastewater infrastructure, we play a significant role in protecting both surface and ground water and OWWS can also be classified as a best management practice. This presentation will provide an overview of source water protection strategies and the role properly functioning onsite wastewater systems play in maintaining safe, healthy, properly functioning watersheds. Best management practices specific to onsite systems will be addressed, along with how the onsite wastewater treatment system industry impacts the often-misunderstood link between wastewater, watersheds, and drinking water protection."

Bio:

Sheryl Ervin has worked in the onsite wastewater industry for 16 years, both as a state regulator and a manufacturer's representative. She joined Infiltrator Water Technologies in 2019 as a Senior Regulatory Specialist and previously held the positions of Program Manager from for the State of Kansas Local Environment Protection Program which managed the onsite wastewater program and managed the state's source water protection program. Ms. Ervin has also worked in the environmental and oil industries. She served for eight years on the Kansas Small Flows Association Board of Directors, for 4 years on the SORA Board of Directors and has participated in NORWA and NSF work groups. Sheryl has a bachelor's and master's degree in Geology and is a licensed professional geoscientist in the state of Texas.

+++++

Dennis Hallahan, Infiltrator Water Technologies

High Strength Waste Design: Best Practices and the way we do it in Texas

Presentation with a paper, 50 minutes

Abstract:

High Strength Wastewater (HSW) is generated by numerous types of facilities such as restaurants, RV Parks, Rest Areas, and numerous other facility types. The decentralized wastewater industry must be in a position to serve these types of facilities. There is the design, construction, and maintenance of the wastewater treatment system. This presentation will focus upon the design considerations as required by Texas Rules and provide an example and/or case study. In many states for the smaller flow systems codes do not address high strength waste and allow the usage of soil loading rates based upon

residential strength waste. This leads to very short design life of HSW facilities. The shortcomings of that design rationale will be reviewed, and a discussion of best practices will be presented.

Bio:

Dennis has over thirty years of experience with the design and construction of on-site wastewater treatment systems. He has authored dozens of articles for on-site industry publications and has given numerous presentations nationally on the science and fundamentals of on-site wastewater treatment systems. Dennis also is responsible for product research and testing at Universities, test centers and with private consultants. His department develops system sizing charts for national and international approvals and assists customers and field representatives in the design, planning and review of large commercial decentralized systems. Some of these systems have design flows in excess of one million gallons per day. He received his MS in civil engineering from the University of Connecticut and his BS in civil engineering from the University of Vermont. Dennis is a registered professional engineer in Connecticut. He has been with Infiltrator Water Technologies for 21 years and holds the current position of Technical Director. Dennis also holds patents for on-site wastewater products and is a member of the Water Environment Federation and of the National Onsite Wastewater Recycling Association. Dennis has served for several years on the NOWRA Technical Practices (past chairman) and Educational Committees' and is also a member of the NEWEA (WEF) Small Communities Committee.

+++++

Kayla Hanson, National Precast Concrete Association

Precast Concrete Tank Inspections & Installation Tips

Presentation without a paper, 50 minutes

Abstract:

Strong, durable, high-quality precast concrete wastewater structures are important components for long lasting and efficient onsite treatment systems. Routine inspections of onsite wastewater tanks – as they arrive on site, after installation, and while they are in service – play a significant role in the long-term performance of the tank and the system as a whole. During this session we will review TCEQ requirements for tank design and construction and discuss ways you can verify these requirements on site. We will also identify key inspection points – what to look for prior to tank installation, how to conduct an inspection prior to backfill, and how to assess a tank that's in service. We will also discuss crucial steps during installation that could impact watertightness, durability, and safety. This session share tips and examples that are beneficial for contractors, service providers and regulators.

Bio:

Kayla graduated from Purdue University in 2013 with a B.S. in Civil Engineering and emphasis in structures. Kayla is a licensed professional engineer in the state of Indiana. As NPCA's Director of Technical Services, Kayla works to coordinate the projects of NPCA's Technical Services engineering team. Kayla addresses technical questions from engineers, architects, and precasters; reviews and updates industry standards and specifications; conducts concrete-, wastewater-, and infrastructure-focused educational sessions at engineering conferences, onsite wastewater conferences, and

universities across the country; develops technical publications; assists with the NPCA Plant Certification Program; performs Plant Evaluations at precast concrete manufacturing facilities; represents the Association on codes and standards committees; and serves as the staff liaison to NPCA's Wastewater Treatment Products Committee and Gravity Grease Interceptor Subcommittee. Kayla is also the Vice Chairman of ASTM Committee C27 on Precast Concrete Products.

+++++

Kayla Hanson, National Precast Concrete Association

Resilient Wastewater Solutions: Building for the Future

Presentation without a paper, 50 minutes

Abstract:

Our nation's aging infrastructure is a common theme in the news. We hear about deteriorating roads, high-risk dams, and old and undersized treatment plants. Wastewater infrastructure is critical to society's daily functions, health, and safety, yet it is one of the lowest-rated aspects of our country's framework. Improving wastewater infrastructure involves billions of dollars of repair, rehabilitation, and new construction work. A key to long-term success is to select quality and resilient construction solutions. During this session we will investigate what resilience is and why resilient construction has become a focal point in both centralized and decentralized wastewater projects across the country. We will discuss what factors contribute to resilience and how resilient construction is changing the way wastewater solutions are developed. We will also investigate how resilient decentralized wastewater solutions can improve safety, reduce construction time, reduce costs, and extend service life.

Bio:

Kayla graduated from Purdue University in 2013 with a B.S. in Civil Engineering and emphasis in structures. Kayla is a licensed professional engineer in the state of Indiana. As NPCA's Director of Technical Services, Kayla works to coordinate the projects of NPCA's Technical Services engineering team. Kayla addresses technical questions from engineers, architects, and precasters; reviews and updates industry standards and specifications; conducts concrete-, wastewater-, and infrastructure-focused educational sessions at engineering conferences, onsite wastewater conferences, and universities across the country; develops technical publications; assists with the NPCA Plant Certification Program; performs Plant Evaluations at precast concrete manufacturing facilities; represents the Association on codes and standards committees; and serves as the staff liaison to NPCA's Wastewater Treatment Products Committee and Gravity Grease Interceptor Subcommittee. Kayla is also the Vice Chairman of ASTM Committee C27 on Precast Concrete Products.

+++++

Sara Heger, University of Minnesota

TSS - Sources, Impacts and Solutions

Presentation without a paper, 50 minutes

Abstract:

Total suspended solids (TSS) is found in all wastewater in varying amounts. The type of facility and activities influence the levels in the raw wastewater. This presentation will provide an overview of methods of quantifying solids in wastewater and typical levels in raw wastewater. The sizing of our primary treatment in septic tanks and the use of screens/filters will be discussed. The reduction of TSS in secondary treatment units such as aerobic units and media filters is another variable impacting TSS. If the levels are elevated it can impact the clogging of filters/screens, media filters, and soil treatment system. This presentation will discuss use, design, and management options to reduce the impacts of TSS on system performance and longevity.

Bio:

Dr. Sara Heger is a researcher and instructor at the University of Minnesota in the Onsite Sewage Treatment Program in the Water Resources Center and is an Adjunct Assistant Professor in the Bioproducts and Biosystems Engineering Department. For over 20 years, she has been conducting research and providing education and technical assistance to homeowners, small communities, onsite professionals, and local units of government regarding decentralized onsite wastewater treatment. Sara coordinates the research program at the U of MN focusing on issues related to decentralized wastewater, chlorides, and milk house process water. She has presented in over 30 different states and provinces in North America regarding the science of wastewater treatment including design, installation, and management. Sara is the president of the National Onsite Wastewater Recycling Association, serves on the NSF International Committee on Wastewater Treatment Systems and chairs Minnesota's SSTS Advisory Committee. She has a BS in Biosystems & Agricultural Engineering and a MS and PhD in Water Resource Science.

+++++

Sara Heger, University of Minnesota

Impacts of COVID-19 on Septic Systems

Presentation without a paper, 50 minutes

Abstract:

There are numerous issues that have arisen related to septic systems in relation to COVID-19. The first relates to worker safety. As the epidemic began and continues concern for those working around wastewater and access to appropriate personal protective equipment (PPE). This presentation will discuss the proper application and use of PPE and other safety measures. This presentation will discuss how COVID-19 is treated septic systems and how the wastewater surveillance on both wastewater treatment plants and septic systems is being conducted. Another challenge that will be discussed is the shifting of wastewater production as many people shifted towards using home offices, home schooling and generally spent much more time at home and the increased their load to their system. At the same

time the use of sanitary wipes and other sanitizing products increased due to heightened safety concerns. This presentation will discuss the short- and long-term potential impacts of these issues.

Bio:

Listed previously.

+++++

Sara Heger, University of Minnesota

Challenging Waste Streams - Analysis and Case Studies

Presentation without a paper, 50 minutes

Abstract:

Septic systems are being negatively impacted by the use and disposal of varying chemicals, cleaners, medicines, and anti-bacterial products. This presentation will discuss challenges related to RV parks, convenience stores, home breweries, salons, dog grooming, medications in-home health care, and others. Data from related studies will be included and potential solutions offered.

Bio:

Listed previously.

+++++

Anna Hilburgh, Texas A&M University

Waste Not, Want Not: A Comparison of Reuse Wastewater Systems

Poster

Abstract:

Contaminated wastewater is a major public health concern, especially when the wastewater has a chance of reentering drinking water sources. At the Texas A&M University System RELLIS campus' Reuse Water facility, four onsite wastewater treatment trains remove contaminants to achieve reuse water quality. This study explores the overall treatment level (OTL) of each train, and whether the water produced at the end meets the Texas Commission on Environmental Quality's (TCEQ's) secondary and reuse water quality standards. In addition, previous analysis of RELLIS campus water conducted by students showed an overabundance of some contaminants in the drinking water; therefore, this study further evaluates levels of those contaminants to determine if they meet the Safe Drinking Water Act (SDWA) requirements. For the four treatment trains, samples from eighteen sites were tested for water contamination in the field and the lab. The samples' averaged contamination levels were compared to other samples to find the OTL of each train and to the TCEQ's standards to determine if the trains are properly working. For the RELLIS campus drinking water, fifteen samples were taken at various points of

the drinking water pipeline or from commercially bottled water. From each sample location, samples were tested at multiple labs for twelve different heavy metals. The average of each sample's heavy metal levels is compared to the SDWA requirements to determine if the water at RELLIS campus is safe."

Bio:

The 2021 Reuse Water Quality Research and Extension Experience for Undergraduates program provides nine students from six different universities with hands-on learning experiences in reuse water quality, exposure to careers in agricultural research and extension, and a pathway to graduate school. The students spend five weeks working with a multidisciplinary team of extension specialists, agricultural engineers, and soil and water microbiologists learning about wastewater and reuse water treatment.

+++++

Anish Jantrania, Texas A&M AgriLife

Updates on state funded onsite wastewater research at Texas A&M University

Presentation with a paper, 50 minutes

Abstract:

At the virtual 2020 NOWRA annual conference, Texas A&M University's On-Site Sewage Facility (OSSF) team members made presentations related to the first round of grant awards made by the Texas Commission on Environmental Quality (TCEQ) to fund three research projects. The field-scale research projects were designed to evaluate: (a) field-performance of aerobic treatment units under high-strength wastewater conditions and different dosing schemes, (b) three types of low-pressure-distribution design concepts, and (c) performance of two types of on-site wastewater reuse technologies under real-world operating conditions. Due to the pandemic shutdown beginning in March of 2020, laboratory and field work involving all three projects was delayed several months. However, progress continued under restricted conditions. By early fall 2020 field installations were completed for all projects and data collection commenced in December. All three experiments then suffered weather-related delays as Texas experienced a severe freezing event in February of 2021. Since March 2021, data collection for all experiments was on track. This paper presents details on the research questions addressed, experimental designs used, data collection plans, technical challenges, and preliminary results. Data collection will continue through July 2021 and final reports are due by mid-December.

Bio:

Dr. Anish Jantrania is an Associate Professor/Extension Specialist in the Biological & Agricultural Engineering Department at Texas A&M University, Texas. Dr. Jantrania has over 30 years of experience working in the wastewater industry, in the public and private sectors, with a focus on On-Site Sewage Facilities (OSSF/septic systems), and decentralized wastewater and water systems. His research and extension interests focus on sustainable infrastructure to ensure the availability of clean water to meet society's water demands, and to ensure safe sanitation to protect public health and environmental quality. Before coming to Texas, Anish has worked in Virginia, Massachusetts, and West Virginia, and has

studied in West Virginia, South Carolina, Ohio, and India. His work in Texas focuses on developing a statewide extension education and research program related to surface and groundwater quality protection with specific emphasis on non-point sources, OSSF, and other environmental issues.

+++++

Jonathan Kaiser, Infiltrator Water Technologies

The Blurred Lines of Onsite and Centralized Wastewater Treatment

Presentation without a paper, 25 minutes

Abstract:

Decentralized wastewater treatment used to only be implemented if there was no possible way to connect to a centralized sewer line. However, there is no longer one solution" in wastewater treatment. Many aspects of wastewater treatment including collection, treatment, disposal, and operation and maintenance are very similar between decentralized and centralized wastewater treatment. This presentation will explore those similarities and dive into details on large decentralized treatment projects with daily design flows that would have been thought to only be treatable via centralized wastewater treatment.

Bio:

Jonathan joined Infiltrator Water Technologies (Infiltrator) in 2016 as a Project Engineer after graduating with his B.S. in Environmental Engineering from the University of Vermont. Jonathan spends his time at Infiltrator working on product regulation and research and development initiatives. He was an active member of Engineers Without Borders, Vermont Student Chapter, researching onsite greywater remediation techniques for reuse in a Nicaraguan coffee growing community.

+++++

David Lentz, Infiltrator Water Technologies

The Environment Beneath the Skid-Steer - Soil Engineering Basics for Onsite System Installers

Presentation without a paper, 50 minutes

Abstract:

Geotechnical engineering is the branch of civil engineering concerned with the behavior of earth materials, involving soil mechanics, geology, hydrology, and geophysics. Onsite wastewater treatment system installers operate equipment above and near underground structures, sloped ground, and potentially unstable soil. Construction equipment creates a sphere of influence in the underground environment that extends both horizontally and vertically, resulting in a variety of concerns during onsite system installation. While geotechnical engineering is an important aspect of onsite wastewater treatment system construction, the below-ground, out-of-sight aspect should not make it a lesser concern. The objective of this seminar is to increase installers' awareness of the conditions that exist in

the subsurface environment during onsite system construction. The discussion covers geotechnical engineering fundamentals as related to onsite system construction, including soil unit weight, earth pressure, stress on buried structures, and slope stability. Soil stress with depth and the lateral extent of stress in soil will be addressed, as well as the effect of static and dynamic stress on buried structures. Publicly available construction videos will be used as case studies to tie the geotechnical engineering concepts to real-life situations.

Bio:

Dave Lentz manages Infiltrator Water Technologies' government affairs department, with responsibility for regulation of the company's effluent dispersal, tank, and treatment product lines. Nationally, Infiltrator is involved in rulemaking, legislation, and industry standards development supporting the onsite wastewater treatment system industry. Dave has over 25 years of experience related to soil and groundwater systems. He holds a Bachelor's degree in structural engineering and a Master's degree in geotechnical engineering, and is a licensed professional engineer.

+++++

Jay LeReche, VOWRA

An Evolving wastewater Island in Henrico Co., VA

Presentation with a paper, 50 minutes

Abstract:

Windsor subdivision in eastern Henrico Co. was developed in the 1970s and 80s. The lots are less than one acre and most homes have a conventional drainfield and a bored well requiring 100' setback. As these modest homes age, more and more drainfields require repair or replacement. The underlying soils are marginal for conventional systems under the current regulations and, in many cases, space for a replacement system is problematic. While homeowner incomes in the subdivision are above poverty level, the cost of an alternative onsite sewage system is cumbersome for these homeowners, especially those who have recently purchased their home and have no significant equity. This community is evolving into a wastewater island due to failing systems, limited space available for repair or replacement, and limited financial resources. We will present an analysis of the challenges these homeowners face as their homes continue to age.

Bio:

Danna Revis is currently a private onsite soil evaluator and operator with Old Dominion Onsite, Inc., in Ashland, VA. She retired from the Virginia Department of Health in 2018 where she served as an EHS in Prince William Co, VA for 14 years and as EH Training Coordinator for the central office for 16 years. Jay LeReche is an Environmental Health Specialist Senior with the Virginia Department of Health in Henrico County Virginia. He began with VDH in 2015 and was a private soil consultant prior to working for VDH."

+++++

Bruce Lesikar, TOWA

Effectively using Flow Equalization Tanks to Manage Wastewater

Presentation with a paper, 25 minutes

Abstract:

Flow equalization tanks are an effective tool for improving the performance of onsite wastewater treatment systems. Flow equalization tanks are typically placed in the treatment train after the first septic/trash tank. Water from the source is collected and time dosed to downstream treatment components. The first tanks are designed for the greatest peak flow rate, but downstream components can treat the water at an averaged flow rate. This averaged flow allows the downstream components to perform more effectively. The presentation will describe the purpose and function of the flow equalization tanks. The selection of the tank will be discussed and key components are identified. The tank components are discussed from a perspective of improving system performance and the associated operation and maintenance requirements. Buoyancy considerations are presented due to the risk of tank flotation. An extremely important part of the flow equalization tank system is the time dosed pump settings. The timer settings are presented. An example is presented on how to determine the timer settings for pump operation. The critical considerations when choosing the timer set points are presented and discussed.

Bio:

Bruce Lesikar, Filtration Application Engineer, United Rentals.

+++++

Bruce Lesikar, TOWA

Water reuse using drip and spray distribution systems

Presentation with a paper, 50 minutes

Abstract:

Water reuse is an important approach to meeting our long-term water needs. Onsite wastewater reuse systems provide a valuable source of water to meet the landscape irrigation needs. Onsite water management will be implemented on residential and commercial properties to effectively utilize all available water sources. Landscape irrigation with wastewater facilitates property owners to have a conventional landscape even when facing landscape water use restrictions. Site water management is critical when designing a system utilizing all water sources on the property. All water sources are identified and discussed with respect to meeting the customer's water needs. Each Design, installation, operation and maintenance features are discussed for site water. The A water balance will be discussed regarding the water available for meeting landscaping needs for residential and commercial system. An outline is presented for designing onsite wastewater treatment systems utilizing a landscaping water balance approach. The landscaping water needs on an annual basis is reviewed in comparison to water

usage in a facility. System features that facilitate easy operation and maintenances actions for system long-term operation are defined.

Bio:

Bruce Lesikar, Filtration Application Engineer, United Rentals.

+++++

Bruce Lesikar, TOWA

How Pump Tanks can be used to communicate the Need for System Maintenance to the Owner

Presentation with a paper, 50 minutes

Abstract:

Pump tanks are used in most secondary treatment systems to collect the treated water and then distribute reuse water into the landscaping around a facility. The pump tank can provide critical information facilitating communication about system performance. Operation and maintenance professionals can use the information gained through evaluating the data gained from these components to inform the customer about the need to perform maintenance activities. Evaluation of pump tanks provides valuable information on the system performance. The water quality in a pump tank following secondary treatment components can indicate to the customer that solids need to be removed from the system. Hydraulic and organic overloading of the treatment system can result in material accumulation in the pump tank. Operational data collected from cycle event counters and elapsed time meters and associated pump performance data can present information regarding the average daily water usage. Comparing the data from the cycle event counter and the elapsed time meter can communicate the need to perform maintenance on the downstream components. The critical components facilitating the collection of the data and how to interpret the data will be described. Data interpretation to communicate maintenance needs will be discussed using example scenarios.

Bio:

Bruce Lesikar, Filtration Application Engineer, United Rentals.

+++++

Dave Lowe, Lowridge Onsite Technologies, Inc.

Fate of Fecal Coliform Bacteria

Presentation with a paper, 25 minutes

Abstract:

The OSCAR is a patented onsite technology that employs the principles of thin film flow and micro dosing through coils of subsurface drip tubing and medium to fine sand media. The technology is comprised of a pre-settling tank to produce settled sewage, a pump chamber for surge flow control, a repeat cycle time controller, a pump, a manual flush headworks with a 120 mesh disc filter, Netafim Bioline, and ASTM C-33 sand. --Septic tank effluent is dosed in very frequent, small doses through Netafim Bioline (0.42 gph emitters) into a 6" layer of sand. The sand has been placed on a prepare soil interface which is the point of final dispersal. Treated effluent migrates into the soil pores and is assimilated into the soil. --OSCAR can receive septic tank effluent or higher quality effluent and achieve a 6 log removal in fecal coliform concentration. Monthly geometric means have been as low as 1.2 FC colonies per 100 ml, MPN. The pre-settling tank can be substituted with another treatment technology to achieve enhanced nutrient removal and pathogen reduction. The OSCAR, coupled with other treatment processes can produce effluent that meets regulatory requirements for reclaimed water. -- The OSCAR can be built inside a containment vessel and treated effluent could be diverted for use or run through another process.

Bio:

Dave Lowe earned a bachelor of science degree from Cal-Poly, San Luis Obispo, CA. He has over 30 years experience in the onsite sewage industry. His background includes pumping septic tanks, installing onsite systems, is a state licensed Onsite Sewage Designer in Washington, and has developed and manufactures wastewater treatment devices. Dave also owns two US utility patents for wastewater treatment devices. Dave has supported the industry by serving as President of the Washington Onsite Sewage Association (WOSSA), member of the Technical Advisory Group of Washington Department of Health, member of the Onsite Rule Revision Committee for Washington State, an instructor at the Northwest Onsite Training Center, and owner of Lowridge Onsite Technologies, LLC.

+++++

Zachary Lowenstein, US EPA

EPA's Decentralized Wastewater Program Update

Presentation without a paper, 50 minutes

Abstract:

The U.S. Environmental Protection Agency (EPA)'s, Office of Wastewater Management, Decentralized Wastewater Program provides resources, education, and outreach at a national level for managing and maintaining decentralized wastewater systems. This presentation will highlight the major accomplishments and updates of the Decentralized Program in 2020-2021, including SepticSmart Week and the ongoing work of the Decentralized Wastewater MOU Partnership. The Decentralized Program's annual outreach campaign, SepticSmart Week, promotes proper care and maintenance of septic systems primarily for homeowners. EPA's Decentralized Wastewater MOU Partnership, which consists of associations and experts in the decentralized field, play a key role in the success of SepticSmart Week. This presentation will include progress updates on the MOU Partnership priorities such as homeowner outreach, data needs, technology, finance, and workforce development.

Bio:

Zach Lowenstein is an Environmental Scientist in EPA's Office of Wastewater Management (OWM), located in Washington, DC. Zach has been with EPA's OWM since 2017, with the Decentralized Wastewater Program, managing initiatives such as SepticSmart Week and the Decentralized Wastewater MOU Partnership. Prior to his employment at EPA, Zach worked for a couple of years in water use and well permitting at the South Florida Water Management District, and before that, as an environmental scientist at a small consulting firm in the oil and gas sector, focused on groundwater and soil remediation. Zach holds a Bachelor's in Environmental Science and Master's in Public Health, both from the University of Florida. Zach resides in Alexandria, VA with his wife and two children.

+++++

Mary Lusk, Univ. Florida

Governance of Onsite Sewage Treatment and Disposal Systems for Nitrogen Management in Florida's Springsheds

Presentation without a paper, 25 minutes

Abstract:

This presentation will discuss recent legislation in Florida that affects onsite wastewater treatment and disposal systems in areas that deliver groundwater to Florida's first-magnitude springs. Florida has more first-magnitude springs than any other state and almost all of them have been listed as impaired waterbodies because of excess nitrate in the water. Septic systems have been identified as one potential source of the nitrate, and new legislation is requiring extensive education about septic systems as well as upgrading of some conventional septic systems to advanced nitrogen-removal systems. This presentation provides a background on the legislation as well as implications for homeowners and the septic system industry.

Bio:

Dr. Lusk is faculty in the Soil and Water Sciences Department at University of Florida-Gulf Coast Research and Education Center. She works to develop research-based programs that help Floridians enhance and protect water quality in urban and urbanizing areas. As part of this goal, Mary works largely on programs that target nutrient and pathogen fate and transport in surface water bodies. Some of her current projects include research on fertilizer runoff from waterfront residential lawns, a statewide educational program on water quality issues related to onsite wastewater treatment and disposal systems (septic systems), and a statewide outreach endeavor to improve manure management and water quality on small urban farms.

+++++

Gary MacConnell, MacConnell & Associates, PC"

Large Community On-Site System Optimizes Development in North Carolina

Presentation without a paper, 50 minutes

Abstract:

In instances where soils and site conditions limit or restrict development, large community systems can be designed to utilize the available good soils to optimize development. A great example of this is a development in central North Carolina. Redesign of a development to take advantage of the good soils within the development increased the number of lots and made for a more efficient and less costly wastewater system. Unique and innovative features were implemented in the collection, treatment, and disposal of wastewater generated on-site. The collection system uses a modified STEP (septic tank effluent pump) system to: eliminate individual tanks on lots, minimize the number of septic/pump tanks, and reduce the cost of the gravity portion of the collection system. It also makes operation and maintenance of the collection system more manageable. The treatment system uses a recirculating media filter which offers several advantages. The recirculating media filter meets NSF Reuse Standards and is relatively easy to operate. It also allows for phased construction and costs for the system. Portions of the treatment system will be turned on as flow increases, which allows for the treatment system to be operated more efficiently. The disposal of treated effluent is through mass drain fields which use drip irrigation. Drip irrigation fields are aesthetically pleasing as natural or grassed open areas which count towards impervious area.

Bio:

Mr. MacConnell is President of MacConnell & Associates, P.C. which is an Engineering consulting firm located in Cary, North Carolina. Mr. MacConnell has degrees from Gettysburg College and Duke University. He is registered in five States and has worked on numerous projects throughout the United States and internationally. He has thirty-seven years of professional experience with on-site wastewater being one of his areas of expertise. Mr. MacConnell has delivered over 60 presentations and papers before national and international audiences.

+++++

Karen Mancl, Ohio State University

Online training for soil and site evaluation

Presentation with a paper, 25 minutes

Abstract:

Registered sanitarians, soil scientists, sanitary engineers, installers and others who work on small and onsite wastewater treatment systems are expected to consider sites and soils for suitability. This new online course has video lectures, demonstrations and homework exercises to prepare onsite professionals to conduct a preliminary evaluation. The course is offered in 3 6-hour segments; soil depth and vertical separation distance, soils in the landscape, and water and soils. The goal of this course is to help an onsite professional to become a soils practitioner to assist soil scientists in conducting site and soil evaluations.

Bio:

Dr. Karen Mancl is a Professor of Food, Agricultural and Biological Engineering and Water Quality Specialist at The Ohio State University where she has published over 50 journal articles and 80 Extension publications on rural infrastructure, food processing wastewater treatment and outreach initiatives. She is past president of the Ohio Onsite Wastewater Association. In 2000, along with Dr. Brian Slater, Soil Scientist, constructed the OSU Soil Environment Technology Learning Lab. At this outdoor teaching and research facility, Drs. Mancl and Slater teach designers, installer and regulators the science and technology of onsite wastewater treatment. In 2014, she expanded the Learning Center to a SW branch in Harrison, Ohio where with Ryan Kopp teaches food processors, operators and engineers about low-cost treatment of food processing wastewater. She received her Bachelor's Degree in Environmental Science from the University of Wisconsin-Green Bay, Master's Degree in Environmental Science from the University of Texas, and received her PhD at Iowa State University in Water Resources. In 2010 she received a second Master's Degree in East Asian Studies and conducts research and teaches wastewater treatment in rural China. In 2019 she received her third Master's Degree in Public Policy and works on international environmental policy with the Woodrow Wilson Center – China Environment Forum.

+++++

Jillian Maxcy-Brown, University of Alabama

Overview of Onsite and Decentralized Wastewater Inadequacies Throughout the U.S.

Presentation without a paper, 25 minutes

Abstract:

The Joint Monitoring Programme of the United Nations estimates that 0.03% (~97,000 people) of the U.S. do not have access to at least basic sanitation. However, publications focusing on underserved populations in urban (Capone et al., 2020) and rural (Maxcy-Brown et al., 2021) areas reveal lack of access to basic sanitation is far more widespread. We collected data from numerous reports documenting onsite wastewater inadequacies throughout the U.S., including open defecation, failing septic tanks, straight pipes, cesspools, honey buckets and outhouses. At least 500,000 persons experiencing homelessness rely on either a shared facility or open defecation. While 20-25% of homes don't have sewer, 65% of U.S. land is reportedly unsuitable for conventional septic systems (Siddoway, 1988). We documented straight pipes in 15 states. Despite a ban on large capacity cesspools, they are still known in at least five states. More households in rural Alaska used honey buckets in 2017 than 2016. The 1990 Census (the last decennial census to collect wastewater data) reported 1% of U.S. residents relied on "other" wastewater management, including outhouses. Outhouses do not always constitute unimproved sanitation, but it is unlikely that they are safely managed. Currently available data are not classified according to the type of inadequacy and have numerous limitations, preventing adequate estimation of the costs and benefits for providing proper wastewater management to all residents.

Bio:

Jillian Maxcy-Brown is a Graduate Research Assistant in the Civil, Construction and Environmental Engineering Department at the University of Alabama. She earned a B.S. in Engineering with a Civil Engineering concentration from LeTourneau University in 2019. She is a student member of NOWRA.

Her research primarily focuses on water and wastewater treatment technologies for underserved, low-resource communities. In 2020, she published a literature review on straight pipes found in 15 states throughout the U.S. which she presented on at last year's conference. Jillian is the lead student on an EPA P3 funded project investigating the potential of Cryptosporidium capture in sewage impacted waters in Alabama. She recently completed a consultancy with Global Communities to conduct a landscape analysis of gaps in sanitation equity throughout the U.S.

+++++

Dominic Mercier, Enviro-STEP Technologies

CASE STUDY: TREATMENT OF HIGH STRENGTH WASTEWATER FROM A SMALL SLAUGHTERHOUSE

Presentation without a paper, 50 minutes

Abstract:

Onsite Wastewater Treatment from a small rural slaughterhouse has been achieved using performing yet simple processes. The Ministry of Environment imposed stringent pre-treatment standards which presented a real challenge using onsite technologies. This talk will present the project, its design criteria and, performance evolution showing that high treatment levels are achievable using simple technologies.

Bio:

Mr. Dominic Mercier holds a bachelor's degree in civil Engineering and a Master's degree in Environmental Engineering with specialization in wastewater treatment. Mr. Mercier is President of Enviro-STEP Technologies, a company specializing in the development, manufacturing and distribution of Onsite technologies across Canada. He has been involved in the Onsite industry for more than 25 years and presented in conferences across Canada and the US.

+++++

Edward Osann, Natural Resources Defense Council

Reinvented Toilets: New Technology and Policy for Non-Sewered Sanitation

Presentation with a paper, 25 minutes

Abstract:

In 2018, a new ISO standard was adopted for non-sewered sanitation devices. Intended to meet critical public health needs in developing countries with limited water and wastewater infrastructure, this new standard also carries important implications for water and wastewater management in North America. Rural communities in many states remain beyond the reach of sewers, while facing soil conditions that preclude conventional on-site treatment. High-tech toilets meeting the new ISO standard -- so-called Reinvented Toilets, or RTs -- could address such needs while protecting water supplies in the face of

drought and a warming climate. Regulators will need policies that ensure the safe adoption and use of this new technology. This presentation will consist of four parts: a) a brief discussion of the vision behind a “reinvented” toilet; (b) an outline of ISO Standard 30500, including scope, performance requirements, and test procedures; (c) an overview of some of the technologies and approaches that are currently in development, field testing, and commercial production; and (d) policies needed to protect people and communities that can benefit from the capabilities of the RT. Participants will be challenged to consider where, in their own state, sanitation devices that require no permanent connection to water and sewer lines would add value or fill an unmet need.

Bio:

Ed Osann is a Senior Water Policy Analyst with NRDC’s People & Communities Program. Since 2009 he has led NRDC’s work on water efficiency through building codes, product standards, utility programs, and conservation pricing. From 1993 to 1996, he served as Director of Policy and External Affairs for the US Bureau of Reclamation. Ed holds a master’s degree in Urban and Regional Planning from George Washington University and a BS in International Relations from Georgetown University. From 2013-16, Ed served on the 7-member Independent Technical Panel on Urban Conservation for the California Department of Water Resources. In 2016, Ed joined ISO Project Committee 305 to develop a product standard for Sustainable Non-Sewered Sanitation Systems, serving as head of the US delegation to this ISO committee. Ed is a member of the AWWA Water Loss Control Committee and contributed to the pre-publication review of AWWA’s Manual M-36, Water Audits and Loss Control Programs, 4th Edition."

+++++

Larry Oxenham, American Society for Asset Protection

Don't Kill your Golden Goose- Protect & Perpetuate your Business

Presentation with a paper, 50 minutes

Abstract:

Is your financial house in order? Discover the tools you can use to become invincible to lawsuits, save thousands in taxes, and achieve financial peace of mind. “It takes a lifetime to accumulate your assets. Take 1 hour to protect them.””

Bio:

Larry Oxenham is one of America’s top asset protection experts, having helped thousands of professionals achieve financial peace of mind by teaching them how to properly structure their assets for lawsuit protection and tax reduction."

+++++

Mesut Ozdemir, Texas A&M University

The Effects of Irrigation With Wastewater on Soil Properties, Plant Response, and Accumulation of Heavy Metals

Poster

Abstract:

Due to the declining availability of freshwater resources, investigating alternative irrigation water sources is becoming essential. Wastewater offers a potential resource that can assist or replace limited freshwater irrigation resources. In addition to the water component, wastewater often contains valuable nutrients, including nitrogen and phosphorus, and may offer benefits by augmenting crop fertilization. Conversely, wastewater could contain undesirable pollutants, including heavy metals. This study aims to investigate benefits and limitations of using raw and treated wastewater as an alternative irrigation water for crop production. Tomato plants were randomly planted in three replications in a greenhouse at the On-Site Sewage Facilities Center on Texas A&M University System's RELLIS Campus. Required irrigation water was provided through three different water sources: tap water (Control), raw wastewater (RWW), and membrane bioreactor treated wastewater (MBR). Also, three different types of irrigation water were formed by using a mixture of treated-untreated wastewater at various proportions of 25%, 50%, 75%. Preliminary results show the average height of the plants irrigated with 50% RWW and 50% MBR is the highest, while the plants' heights irrigated with other water types are similar. Additionally, the plants that yield the most tomatoes were irrigated with RWW while the plants with the least yield were irrigated with tap water. Moreover, it was determined that heavy.

Bio:

Mesut Ozdemir, a student technician at On-Site Sewage Facilities Center on Texas A&M University System's RELLIS Campus, is a graduate student at Texas A&M University. Mesut has developed himself in the field of wastewater and is able to teach his knowledge to students of the Reuse Water Quality Research and Extension Experiences for Undergraduates (REEU) program without having a problem. He especially assists students in the use of devices such as Colorimeter, Hanna Multiparameter, and ICP-MS. Additionally, while he is happy to be involved in many projects, he encourages those around him to work and be successful with his tireless energy. Özellikle Colorimeter, Hanna Multiparameter, ve ICP-MS gibi cihazların kullanımını konusunda öğrencilere yardımcı olmaktadır.

+++++

Jeff Pringle, Orenco Systems, Inc.

Resilient, Adaptable, Liquid-Only Sewers

Presentation without a paper, 50 minutes

Abstract:

Liquid-only sewers (LOS) are an adaptable, economically sustainable collection technology. In these systems, an onsite unit provides primary treatment and filtration of raw wastewater at the source. Solids, scum, inorganics, and FOG are retained in the onsite tank, with liquids conveyed away for additional treatment. LOS effluent has up to 95% fewer settleable solids, up to 70% to 90% fewer suspended solids, up to 75% to 90% less FOG, 65% to 70% lower BOD, and 65-70% lower TSSv compared to raw wastewater. Onsite units are manifolded together with lines like water mains. These provide

conveyance to treatment facilities for final treatment, typically without needing intermediate pumping or lift stations. LOS systems mitigate potential risks of line breaks and sewer overflows since they're designed to be watertight like a domestic water system; are generally installed above the water table; and convey partially treated wastewater from the source to the treatment plant. Systems can include storage volume for power failures, have low energy requirements, and can accommodate discharge solutions located anywhere within a community. Onsite units can be installed with access and controls above flood elevations. Components can be adjusted when climate impacts get more severe. If units are damaged by weather/flooding events, service can quickly be restored by replacing damaged units and/or providing temporary piping aboveground.

Bio:

Jeff Pringle is an Account Manager for the Western U.S. Region at Orenco Systems® Inc., a wastewater equipment manufacturing firm based in Sutherlin, Oregon. In this role, he works to manage and grow customer accounts in California, Nevada, Arizona, Texas, and Hawaii. Since joining Orenco in 2005, Jeff has become a frequent presenter for the company, providing training for regulators, engineers, installers, service providers, and electricians, as well as other Orenco customers. Jeff has an Associate of Applied Science degree in digital systems technology from Umpqua Community College in Roseburg, Oregon. Prior to Orenco Systems, Jeff was a general contractor, worked in the wood products industry, and for Intel Corp in Hillsboro, Oregon. In his spare time, Jeff enjoys traveling with his wife, Betty.

+++++

Danna Revis, VOWRA

A Lifetime of Water Use

Presentation with a paper, 50 minutes

Abstract:

Onsite sewage systems last for decades, but not forever. How does the life of an onsite sewage system correlate with the life of the family that owns and operates it? This paper will explore the lifetime of a drainfield vs. the lifetime of the family."

Bio:

Danna is a Master Alternative Onsite Soil Evaluator working in Ashland, VA with over 30 years experience in the onsite wastewater industry. She began as a private soil consultant 1983. In 1987 began working for the Virginia Department of Health, first as an Environmental Health Specialist in Manassas, VA, and then as Training Coordinator for the Office of Environmental Health Services. In 2018, she retired from VDH and is currently working as an onsite soil evaluator, designer, and operator for Old Dominion Onsite, Inc., in Ashland, VA. She holds a bachelor's degree in geology from the College of William and Mary and a master's degree in learning technologies from Pepperdine University.

+++++

Bob Salvatelli, Origination for Sustainable Water

WaterHub- On-site Reuse at UT Austin

Presentation without a paper, 50 minutes

Abstract:

With limited water resources and significant population growth, the City of Austin is becoming increasingly focused on sustainable water management. While municipally provided reclaimed water has been a success, a decentralized approach at The University of Texas at Austin is being developed to displace 1 MDG. This presentation will feature Juan Ontiveros, AVP of Utilities, Facilities and F&M will discuss how reuse improves the functionality of facilities management by optimizing production and decreasing operational costs along with providing a living, learning laboratory for the campus.

Bio:

Bob Salvatelli is the Director of Origination for Sustainable Water. Over the past decade, he has championed water conservation and water reuse opportunities across the United States in diverse market sectors such as: higher education, food and beverage, automotive manufacturing, governmental and airports. Prior to joining Sustainable Water, Bob was an executive in both the building products and construction industries, serving the institutional, industrial and commercial spaces. Bob has extensive experience in all phases of construction including estimation, preconstruction, procurement, project management and commissioning. Bob received his Bachelor of Science in Management from Providence College.

+++++

Elisabeth Schlaudt, Environmental Protection Agency

Decentralized Needs and the Clean Watersheds Needs Survey

Presentation without a paper, 25 minutes

Abstract:

The Clean Watersheds Needs Survey (CWNS) is conducted by the Environmental Protection Agency (EPA) to assess the capital costs (or needs) to meet the water quality goals of the Clean Water Act and address water quality-related environmental and public health concerns. Needs are organized into categories based on project eligibilities in the Clean Water State Revolving Fund (CWSRF) program, a federal-state partnership that provides communities low-cost financing for a range of water quality infrastructure projects. Legislative changes to the types of projects eligible for loans through the CWSRF program and the elapsed time since the last data collection in 2012 prompted EPA to conduct an extensive review of the CWNS. A key result was the conclusion by state and other external partners that the decentralized wastewater treatment category was likely significantly underestimated in previous

surveys. To work towards capturing decentralized needs to the greatest extent possible, EPA collaborated with state-level partners to design a new data entry portal and streamline the documentation requirements for submitting needs. In addition, EPA updated the underlying data for the cost estimation tool developed to help communities estimate their decentralized needs. State-provided data collected through survey participation will be used to validate the tool and improve future surveys. The results of the CWNS will be published in a Report to Congress and made publicly available.

Bio:

Elisabeth Schlaudt is a physical scientist at the EPA working on the development of the Clean Watersheds Needs Survey, a comprehensive assessment of the capital costs to meet the water quality goals of the CWA and address water quality and water quality related public health concerns. She has a masters in Geoscience-Hydrogeology and a masters in Water Resources Management both from the University of Wisconsin-Madison.

+++++

Martine Seguin, Premier Tech Water and Environment

Challenges of treating high strength wastewater treatment – Comparing different approaches

Presentation without a paper, 50 minutes

Abstract:

Most states have not considered high-strength wastewater characteristics when defining guidelines for designing on-site sewage disposal systems. Wastewater is usually defined as high-strength when concentrations of BOD, TSS, FOG, or nitrogen are higher than typical domestic wastewater. The focus is commercial and non-residential water usages that lead to unusual or high wastewater strengths. These include restaurants, truck stops, breweries, etc. Many states now recognize that the treatment of high BOD5, TSS, or FOG concentrations requires different strategies than those used for typical domestic applications. Several pretreatment possibilities exist, but the extent to which they reduce high-strength wastewater is not fully understood. Treatment must not only reduce wastewater strength, but also bring effluent quality into conformity with stringent discharge limits. Highly variable conditions and limited operator knowledge mean that treatment systems must be simple, flexible, reliable, and robust. Premier Tech tested and adapted approaches to reach different treatment levels. These relied on trickling towers or MBBRs for water roughing, or combining one of these technologies with biofilters as a final polishing step to ensure the system consistently meets the most stringent discharge target because it acts as a physical barrier. This approach enhances performance on certain parameters, such as nitrification, without adding substantial cost. In addition, economic analysis show.

Bio:

Martine Séguin is an Application Engineer at Premier Tech Water and Environment (PTWE), a Canadian company and world leader in the Onsite Wastewater Treatment industry. She currently manages the Commercial, Communal and Institutional (CCI) engineering team within PTWE. Ms. Séguin joined Premier Tech in 2006 and has since occupied different functions in the wastewater treatment field,

whether on the Research & Development team or design engineering CCI team. For more than 15 years, Ms. Séguin has developed a thorough knowledge of the decentralized wastewater treatment system industry. Her expertise benefits the clients in determining the appropriate solution, best suited for their needs. Ms. Séguin holds a Civil Engineering degree from the University of Ottawa.

+++++

Kimberly Seipp, NAWT

NAWT The Summary of the Life Cycle and the Principles of Onsite Wastewater Treatment Systems

Presentation without a paper, 50 minutes

Abstract:

After discussing the Onsite Wastewater Treatment Systems life and a life cycle from the different stages, we now need to know “where do we go from here”? There is a need for practitioners to become active in the industry at many levels to help move the industry forward and to protect our vital resource. This presentation is going to summarize the previous sessions. The participants will recognize the need to be an active participant in the industry. They will be able to discuss the importance of understanding the life stages of an OWTS and their role within the that life cycle. They will determine the need for their involvement with local, state and national organizations which advocate proper OWTS development, care and usage. At the end of this session, the participant will revisit and recognize the importance of being a principled practitioner and will be able to identify the defined principles which were covered in the previous sessions.

Bio:

Kim Seipp has been in the Onsite Wastewater industry since the early 1980’s. Her and her husband own and operate a septic tank cleaning and inspection business in Colorado. They have worked in both the mountains and out on the eastern plains of Colorado. Kim became involved with the Colorado Professionals in Onsite Wastewater the local state association to help create information, training and educational opportunities for both professionals in the industry and homeowners. She was instrumental in using the NAWT nationally recognized courses as the bases and foundation for the training program currently used by CPOW. CPOW currently uses all the of the NAWT courses and has developed CO specific courses as a result of a growing need for training, education and certification of professionals in the onsite industry. In 2016 Kim transitioned from working with CPOW to working with NAWT as the Educational Coordinator for NAWT and is the current President of NAWT. Kim has a BSBA in Business Administration and Management.

+++++

Kimberly Seipp, NAWT

NAWT The Life Cycle and The Principles of OWTA

Presentation without a paper, 50 minutes

Abstract:

Onsite Wastewater Treatment Systems have a life and a life cycle. They go through the inception stage where they are born; there is the development stage where they are created; the life stage where they are maintained and operated and periodically inspected. Understanding the life cycle of a OWTS is vital to all sectors within the industry. Each stage of the life of an OWTS has principles that help to make the process more efficient and in turn help support and assist the other sectors that are involved in the life of the system. This presentation is going to summarize the life cycle and the significance of understanding, implementing and abiding by a principled approach to Design, Installation, Operations and Maintenance, Inspections. The session will also demonstrate Business concepts that will help to tie all the practitioners' efforts into creating and maintaining an OWTS business within the industry. At the end of this session, the participant will recognize the importance of being a principled practitioner and will be able to identify the defined principles which will be expanded on in the upcoming sessions.

Bio:

Listed previously.

+++++

Kimberly Seipp, NAWT

NAWT The Life Stage and Installation Principles of Onsite Wastewater Treatment Systems

Presentation without a paper, 50 minutes

Abstract:

The second stage in the lifecycle of an OWTS is the installation of an Onsite Wastewater Treatment System is more complicated than individuals realize. With a better understanding of wastewater treatment over disposal; they have, over time, become more complex. The installer is in a unique position within the creation and lifecycle of an Onsite Wastewater Treatment System. The principles that will be covered in this presentation will discuss the Professional Installers place in the life of an OWTS. The importance of a complete understanding of how OWTS work so when they are working on an install, they appreciate the intricacies of the design. We will discuss the need for communications skills and how Installers are in a distinctive position because they have to be able to communicate up and down the line of people involved in the life cycle of an OWTS, from regulator and designer to homeowner and user. We will cover the importance of the design and using the design as a tool for bidding as well as creating the intended OWTS. The discussion will also talk about being the "ethical installer" and making sure that as an installer they are working to be the best they can be as a professional within the onsite industry and the importance of obtaining proper training, education and certification credentials.

Bio:

Listed previously.

+++++

Kimberly Seipp, NAWT

NAWT Mid-Life and Operations & Maintenance Principles of Onsite Wastewater Treatment Systems

Presentation without a paper, 50 minutes

Abstract:

The third stage in the life of an OWTS involves the Operations and Maintenance sector of the industry. This is a rapidly growing sector. As the Onsite Wastewater Treatment Systems become more complicated to ensure proper treatment there is a rise in need for individuals who can provide system maintenance for the life of OWTS to keep them functioning as intended and not creating any environmental or public health issue. The principles that will be covered in the is presentation will discuss the rise in need of professionals in this sector of the OWTS industry and the many types of systems that are available across the county. We will discuss how professional O&M providers will have to have vast array of training not only in basic OWTS systems and their operations, but also specific training in the different proprietary units that are and/or may be available in their area. The discussion will include the importance this stage of the life cycle and the need for maintaining the entire system and not just one or two proprietary components. We will discuss the importance of having good communication skills to interact with and educate homeowners on proper OWTS usage. There will be a discussion of the need for good basic business skills and understanding the importance of contracts and ethics. The discussion will also include being properly trained, educated and certified as an Operations and Maintenance Professional.

Bio:

Listed previously.

+++++

Kimberly Seipp, NAWT

NAWT Mid-Life and Inspection Principles for Onsite Wastewater System

Presentation without a paper, 50 minutes

Abstract:

Inspections occur for many reasons at the different stages within the life cycle of an OWTS. Onsite Wastewater Treatment Systems are often neglected due to ignorance of the homeowner as to proper care and maintenance. It is up to Onsite Wastewater Professionals to be educated on OWTS systems and be able to inform the homeowner on proper care and maintenance of even the most basic system. The principles that will be covered in this presentation will discuss the life cycle of an Onsite Wastewater Treatment system and the types of inspection that should occur during that life cycle. We will define what constitutes a “system” and the importance of evaluating the entire system during the inspection process. We will discuss the importance of understanding how OWTS function and being able to evaluate the performance of the individual components of the system. A description of a full septic

inspection will be introduced and the importance of following a protocol that covers all the steps in a full inspection will be covered. We will also delve into a discussion of ethics and being a professional in the onsite industry and the importance of obtaining proper training, education and certification as a professional.

Bio:

Listed previously.

+++++

Kimberly Seipp, NAWT

NAWT The Principled Approach of a Wastewater Treatment

Presentation without a paper, 50 minutes

Abstract:

The treatment of wastewater does not end at the final dispersal area. Septic tanks, trash tanks and other components along the treatment train will need to be serviced and pumped out at times. Wastewater Treatment is another region of the industry that needs to have a principled approach to application and purpose. This session will delve into the options that are available to wastewater haulers. We will discuss the pros and cons of the different options and what principles should be applied in selecting the appropriate option for your business. After this session, the participant will identify the economics of wastewater disposal for the available options. They will distinguish the advantages and disadvantages of creating their own dedicated disposal site. This discussion will also cover the importance of understanding the life cycle of OWTS and the wastewater treatment role in that life cycle.

Bio:

Listed previously.

+++++

Arvin Shadravan, Texas A&M University

Graphene Oxide Based Thin Film Nanocomposite Reverse Osmosis Membrane for the Effective Removal of Ammonia from Aqueous Solution

Presentation without a paper, 25 minutes

Abstract:

Ammonia is regarded as one of the major contaminants that contributes to water pollution. Ammonia generally exists in the form of non-ionized (NH₃) or ionized (NH₄⁺). These two species of ammonia are known as the predominant pollutants in the drinking water sources. The non-ionized form is the most

toxic because it is uncharged and soluble in lipid. Ammonia can present in both municipal and industrial wastewaters. In industrial-based wastewater, the ammonia content may be in the range of 5–1000 mg/L. In this study, reverse osmosis membrane incorporated with Graphene Oxide was embedded into the active layer of the membrane. A gradient nanocomposite membrane has been demonstrated through simulation-guided design. The simulation results suggested that the protective layer should be less than 100 nm thick with <130 nm pores at a porosity of 72%. As-fabricated nanocomposites membranes exhibit water permeance as high as 21.34 L h⁻¹ m⁻² bar⁻¹ and ion rejection rate >96.08%. Conclusively, the finding of new techniques for the removal of ammonia in wastewater is becoming vital. The regulation of the permissible amount of ammonia content in drinking water and wastewater has becoming more stringent worldwide. These technologies and approaches result in relatively promising solutions.

Bio:

Arvin Shadravan is a Ph.D. student at Texas A&M University. I did my BS and MS in Chemical engineering and my expertise is as follows: Renewable Energy, Water and Wastewater Treatment, Desalination, Nanomaterials, Membrane Technology, Thin Film Nanocomposite, Polymers, Material Science, Adsorption, Separation Technology, and Reverse Osmosis. Currently, I am working on membrane fabrication embedded with novel nanomaterials for Ammonia removal in wastewater treatment.

+++++

Kevin Sherman, SeptiTech, Inc.

An examination of the operational process of the STAAR artificial media filter system

Presentation with a paper, 50 minutes

Abstract:

An operational process analysis answers two questions: what is it?...and what does it do? The acronym STAAR stands for Smart Trickle Anaerobic Aerobic Recirculating, and it is an artificial media filter system. The STAAR is one example of a class of system called media filters. Two main media categories are natural and man-made. Each media category can be designed in single pass or recirculating modes. Recirculating mode is typically used to reduce total nitrogen in effluent using a well-established process called biological nitrogen reduction or BNR. Biologically mediated nitrogen reduction consists of encouraging nitrification, followed by denitrification in distinct places in a wastewater treatment system. The irony of BNR is that although bacteria are used in both process steps, the environmental requirements of the bacteria responsible are remarkably different. In the case of media filters, nitrification occurs by passing the effluent through an oxygen-rich porous media. The next step in the process, denitrification, is necessary to convert the oxidized forms of nitrogen into inert nitrogen gas. The STAAR media filter uses a two-tank system to accomplish this task. In the first tank, a septic tank blends incoming wastewater flows and strains suspended solids out of the effluent before entering the second tank, called the processor tank. In the processor tank a pump transfers oxygenated effluent and sloughed solids back to the headworks of the septic tank.

Bio:

Kevin Sherman has Bachelor of Science degrees in Biology and Civil Engineering, Masters Degrees in Biology and Public Health and a Ph.D. in Biological Oceanography. He has written over 50 technical papers on decentralized and individual onsite wastewater systems over his career. Before becoming Director of Engineering and Regulatory Affairs for SeptiTech, Inc., Kevin was a technical specialist for Presby Environmental, Inc., and Vice President of Engineering for Clearstream Wastewater Systems. Dr. Sherman was also formerly the Director of Engineering for Quanics, Inc., executive vice president of the Florida Onsite Wastewater Association and before that worked for 14 years at the Florida Department of Health. Kevin is past president of the Florida Environmental Health Association and this association. He is a professional engineer in seventeen states and a registered sanitarian in Florida. He has achieved the distinction of being named a diplomat of Water Resources Engineering."

+++++

Kevin Sherman, SeptiTech, Inc.

Case Study: Using a high strength membrane bioreactor for an affordable housing project with a stringent total nitrogen effluent standard

Presentation with a paper, 50 minutes

Abstract:

Approximately 50 miles south of Boston, the town of Westport, MA sought to develop an affordable housing project with the capacity to treat the wastewater from 50 residential apartments. The planning board set an ambitious effluent limit for the 31-acre site: less than 5 mg/L TN at the outlet of the treatment system and a Net Zero TN at the property line. Membranes have been used to consistently treat domestic wastewater to low contaminant concentrations. A membrane bioreactor (MBR) is a technology that has been used to treat municipal and industrial wastewaters. An MBR typically combines an ultrafiltration membrane and a suspended growth bioreactor to produce an effluent with low concentrations of pathogens, BOD and TSS. This case study provides evidence that when factors such as use of commercial effluent filters, flow equalization, supplemental alkalinity carbon augmentation coupled with drip irrigation, a stringent effluent is reachable. Noquochoke Village began operation on May 7th 2019. The case study will discuss lessons learned by the designer, installer and operator of the project over the last two years. Thus far, the high strength membrane bioreactor has exceeded expectations by consistently producing a TN of less than 5 mg/L without using a daily operator or requiring repeated modification to the the operations. The system has displayed robust performance despite fluctuations in influent temperature, strength measures and flow volumes."

Bio:

Listed previously.

+++++

Tanya Wilson, NAWT

NAWT The Full Life and Business Principles of an Onsite Wastewater Treatment System

Presentation without a paper, 50 minutes

Abstract:

Understanding of basics of operating a business is vital to life cycle for any industry. The Onsite Wastewater Industry is often looked down upon due to the subject matter we deal with. One way to dispel this view from the outside is to promote good business practices and emit professionalism at all levels. The principles that will be discussed in this session will involve a discussion of the diversity of the OWTS industry and the need for professionals to have many different levels of business skills. The importance of having a business mindset and a basic understanding of business operations will be introduced. Topics for discussion will also cover understanding any legal requirements, communications and interactions with customers and other professionals, dealing with personnel issues and the importance of pricing and marketing your services. We will also include a discussion of the importance of being a leader in the industry and being involved in local and national organizations for the promotion of the industry. We will talk about being a professional and being an example of ethical behavior to others within the industry. The discussion will also cover the significance of ensuring proper training, certification and credentialing for individuals and employees within the industry as an important part of running an OWTS business.

Bio:

Tanya Wilson is a member of the NAWT Education Committee. Her experience in the wastewater industry is 12 years strong and her true passion is building (and coaching others to build) profitable home service companies. She has built three septic companies in the Phoenix market area and is currently running a third, Priority Pumping with a team of 9, two trucks, repair team and two installation crews. She also runs an all-female junk-removal company and an online community where she brings together women working in the skilled trades/home service industry and mentor/coach them to build wildly successful companies.

+++++

June Wolfe, Texas A&M AgriLife Research - Temple

Development and application of a synthetic high strength waste formulation for evaluating aerobic treatment unit performance

Presentation with a paper, 25 minutes

Abstract:

In 2019 Texas A&M AgriLife Research was awarded a contract by the Texas Commission on Environmental Quality to investigate Aerobic Treatment Unit (ATU) performance under increasing organic strength and equalized dosing. A synthetic high-strength wastewater (SHSW) formulation was required to carry out the research. Several materials and configurations were considered based on cost, availability, ease of handling, and ability to produce experimentally planned organic loads. Laboratory methods were used to determine the relationship between the mass and the 5-day biochemical oxygen

demand (BOD5) of selected materials. ATU operational hydrology and amendment handling procedures required careful adjustment in order to raise the ambient raw waste stream BOD5 concentrations to desired target values. This presentation will describe the development of the SHSW formulation, the ATU waste trains under evaluation, amendment dispensing mechanics, and some general results of the project.

Bio:

Dr. June Wolfe III is an Associate Research Scientist with more than 30 years of service at Texas A&M AgriLife Research - Blackland Research and Extension Center in Temple, Texas where he directs the Water Science Laboratory and conducts basic scientific research involving plant-soil-water topics assessments. Dr. Wolfe holds undergraduate and graduate degrees in biology, chemistry, horticulture, and aquatic microbiology. Since 1994, he has managed numerous research projects requiring expertise and knowledge of environmental instrumentation and monitoring used to investigate nutrient, bacteria, and contaminant fate issues in surface waters. Dr. Wolfe has more than 10 years of experience in wastewater research and currently leads two projects funded by the Texas Commission on Environmental Quality's Texas Onsite Grant Program. These projects are investigating aerobic treatment unit performance under high-strength flow conditions and comparing demand verses equalized dosing schemes.

+++++

Cory Yarrington, West Virginia University

National Assessment of Onsite Wastewater Treatment Systems (2015-2018): Trends and Resources

Presentation with a paper, 25 minutes

Abstract:

Onsite wastewater treatment systems (OWTS) have been and will continue to be a viable option for the treatment of wastewater in areas not served by centralized wastewater treatment systems. The measurement of OWTS utilization on a national scale has not been conducted since the 1990 Census. In response, the National Environmental Services Center (NESC) has conducted a national assessment of onsite wastewater treatment system (OWTS) permits in 1993, 1998, and 2015 - 2018. The OWTS data collected in this effort includes new, residential system permits; residential system repairs; new, commercial system (multi-family, commercial, institutional, etc.) permits; and commercial system repairs. The breakdown of the data shows size and types of OWTS permits reported as well as the relation of OWTS permits with new housing. The combination of OWTS and new residential housing permits led to the concept development of Onsite System Utilization Rate (OSUR), a measure to calculate the percentage of new residential housing built with onsite wastewater system permits. The national OSURs for 2015-2018 accounts for approximately 1/3 of new housing. This effort exemplifies a) widespread reliance on decentralized wastewater treatment to properly treat wastewater across the United States, and b) the need to leverage appropriate resources to ensure continued environmental and public health protection.

Bio:

Prior to graduate studies, Cory Yarrington completed his work at the National Energy Technology Laboratory with a published paper in the Journal of Energy Resources Technology. Shifting from chemical engineering to civil and environmental engineering, Cory completed his MS with a focus in construction asset management. The thesis revolved around artificial intelligence, forecasting, and data mining. Currently, Cory Yarrington is a PhD student studying under Dr. Lian-Shin Lin within the Civil and Environmental Engineering Department at West Virginia University. The project was conducted jointly with the National Environmental Services Center (NESC) and Infiltrator LLC. The initial goal of the study was to determine assess the national trend of onsite wastewater treatment systems (OWTS) over time for OWTS. A later focus with ArcGIS mapping and hotspot analysis led to deeper understanding of the OWTS trends and correlations with geological and socio-economic factors.