1. Wednesday, August 30, 2023
Room 201-202
8:30 AM - 9:00 AM

Title: **Reducing the Flow**

Presenter:
Ed Carpenetti
Condition Assessment Lead, Black & Veatch

Abstract:
Hillsborough County (County), Florida, has experienced strong population growth in recent years, which has increased the demand on their existing wastewater collection system. To maximize the capacity of the collection system, the County started a comprehensive mainline cured in place (CIP) lining program. After CIP lining the mainlines, the County continued their infrastructure investigation and conducted a post CIP lining sewer inspection and rehabilitation program focused on infiltration reduction. The purpose of the post CIP program was to identify the source of lateral infiltration, public or private, and rehabilitate laterals up to the property line. Infiltration reduction minimizes increased wastewater flows experienced when the groundwater table is high and following wet weather events, while reducing the opportunity of sanitary sewer overflows. For gravity mainlines, infiltration is traditionally identified through the completion of Sewer System Evaluation Surveys (SSES) that include manhole inspections, flow monitoring, closed circuit television (CCTV) inspections, smoke testing and dye water testing. These assessment technologies quickly identify areas susceptible to inflow and infiltration (I/I). To identify individual laterals that were leaking, post CIP lining, Electro Scan's Focused Electrode Leak Location technology (FELL) was used in combination with traditional lateral CCTV conducted in compliance with NASSCO Lateral Assessment Certification Program (LACP) guidelines. Benefits 1. The presentation will benefit the industry by providing post CIP lining condition assessment results indicating that only lining gravity sewer mains will not reduce infiltration entering the system if tap connections and defective laterals are not sealed. Results of the investigation indicate that a comprehensive CIP lining program in a high I/I area should include the sealing of tap connections and lateral lines to the property line or cleanout. Additionally, the presentation will explain how newer technologies such as FELL can be incorporated into traditional SSES investigations to identify I/I. 2. This presentation will benefit the industry by identifying construction issues related to the repair and rehabilitation of tap connections and lateral lines utilizing chemical injection grout and full wrap CIP lateral liners. For example, Full Circle Lateral Repair Liners (FCLRL) that extended 3 feet from the mainline lateral tap connection do not require the installation of a cleanout; however, FCLRL repairs that extend more than three (3) feet require the installation of a cleanout to facilitate installation of the liner system. 3. To track the progress of this project and support the County's growing asset management program, the County developed a GIS asset registry to capture lateral tap connection points, lateral lines, and cleanouts. This presentation will explain how a GIS application was developed to collect locations of lateral line attribute data, and repair and rehabilitation information in real time. Conclusion: The County began post Cured in Place lining investigation work to address ongoing infiltration issues by utilizing the innovative FELL technology to identify leaking laterals in Hillsborough County's Clair Mel Area. Results of the FELL study indicated 25 percent of the sewer mains previously lined had laterals that were contributing infiltration to the system. Based on FELL infiltration rates traditional CCTV lateral inspections work was completed, which visually confirmed the presence of infiltration identified by the FELL technology. Based on CCTV inspection results, 53 percent of the lateral defects were located on the public side of the lateral and that the infiltration could be addressed by chemical injection grouting or a structural CIP liner. Overall, laterals are

a significant source of infiltration entering the wastewater collection system. By sealing tap connections and lateral lines the amount of infiltration entering the system can be reduced which will maximize the capacity of the system and increase the useful life of aging infrastructure.

Learning Objectives:

Inflow and infiltration contributed from laterals.
Field changes related to lateral repair and rehabilitation.
Building a lateral asset registry.

Biography:

As a Program Director with over 20 years of Civil/Environmental engineering experience, Edward has supported a variety of water and wastewater programs with the development of comprehensive Capital Improvement Plans (CIPs); and condition assessment, rehabilitation, and asset management plans.
In addition to his professional work, Ed is very active in the industry and has volunteered his time to develop National Association of Sanitary Sewer Companies condition assessment protocols; and is currently supporting the WEF AM Committee and NASSCOs AM Committee with the development of asset management training modules. Mr. Carpenetti has experience training and presenting technical information to stakeholders and is a certified NASSCO PACP/MACP/LACP Trainer.

2. Wednesday, August 30, 2023
Room 201-202
9:00 AM - 9:30 AM

Title: At the mercy of the downpour: The Creekbed sewers facing the damaging effects of stream erosion

Presenter:
Tatiana Baranova P.E.
At the mercy of the downpour: The Creekbed sewers facing the damaging effects of stream erosion., DC WATER AND SEWER AUTHORITY

Abstract:
Over the past decade, the intensive urbanization throughout the District of Columbia has caused detrimental impacts on local streams leading to increased water levels and erosion of the District's surrounding stream banks and creek beds. As many of DC Water's assets are installed near streams, erosion of the stream banks and creek beds often results in exposure of manholes and pipe alignments, which increases the likelihood of failure. To monitor and assess the condition of creek bed pipe crossings, DC Water established the Creek Bed Inspection Program in 2014 to inspect sewers and manholes potentially affected by stream erosion. The program consists of two parts: (1) an annual inspection of creek bed pipe crossings which is conducted during leaf-off season and (2) ongoing post-rainfall inspections of creek bed crossings based on the amount of precipitation and intensity caused by heavy rainfall events. The program has been instrumental to identify the critical creek bed pipe crossings and manholes, as well as to prevent from the assets from further deterioration. The Creek Bed Inspection Program adds a substantial value to the DC Water's Pipe Condition Assessment (PCA) Program of DC Water's sewer assets and is a critical piece of DC Water's mission to provide a high level of service in a safe, environmentally friendly, and efficient manner.

Learning Objectives:
To demonstrate the key steps of the Creek Bed Inspection Program including inspection planning, methodology, and inspection criteria used for the annual and post-rainfall inspections.
To discuss the concept of Creek bed pipe crossings condition assessment and prioritization for rehabilitation based on the pipes' associated criticalities.
To review the inspection results and lessons learned from development of Creek Bed Inspection Program

Biography:
Tatiana Baranova is a Civil Engineer with DC Water and has grown her career in Water/ Wastewater industry over ten years. In DC Water, her primary focus is managing sewer inspection and condition assessment projects.

3. Wednesday, August 30, 2023
Room 201-202
9:30 AM - 10:00 AM

Title: Inter-agency collaboration for risk management

Presenter:
Steve Bian
Supervisor of civil and structural design, DC Water

Abstract:
Before 1920's, major creeks in DC were encased in masonry trunks, facilitating it to serve as a tunnel for conveyance. Masonry sewers and local sanitary pipes/culverts, comprised of stone, brick or lean concrete were built in shapes of the "roman arch," supporting the century long urbanization inside DC, facilitating development of many landmarks and famous neighborhoods. Today, hundreds of miles long masonry sewer built in above fashion, ranging from 2'x3' to 22-ft diameter, typically in congested early developed downtown area, remain mission critical in our collection system. The district is significantly congested in both above grade and below grade that multiple agencies laid their own linear assets side by side, above and beneath. The integrity management of such century old masonry pipe has demanded a unique mindset and skillset in condition assessment and adjacent construction impact evaluation, prior, during and after adjacent construction. In July 2021, DC Water discovered damage to a 39"x56" oval shaped brick sewer trunk near 15th Street and Florida Avenue NW. DC Water team launched into emergency response action in multiple steps to prevent such localized damage of "bottom fall-out" from cause of street sinkhole. • By collaborating with peer agency and DDOT, we convinced the owner of the hand tunnel to fill it solid with flowable fill in the first post incident meeting. • By in-depth knowhow of masonry arched sewer, we deployed extended chemical grouting to solidify the compromised bedding and its "abutment". • By hydraulic modeling we clarify which structural rehabilitation solution will not cause surge in sewer of potential street flooding. With above multi-step mitigation, DC Water emergency response team deployed swift action and successfully achieved our integrity management goal and prevented a street sinkhole pertaining to our circa 1880's brick trunk sewer that was damaged by an adjacent construction by others. This case study will share with peer agencies, engineer consultant and utility contractor a few critical knowhows for integrity management of buried asset in congested urban street.

Learning Objectives:
adjacent construction in congested urban setting
how to be a "good neighbor"
comprehensive rehab of century old masonry collection system

Biography:
Mr. Steve Bian plays a role of integrity manager as the supervisor of civil and structural design section in DCWATER.Engineering. He is also chairman of DCWATER new material committee. His duty in DCWATER covers full spectrum of responsibilities related to planning, design, construction, and emergency response for both vertical and linear assets.
He has been with DC Water since 2005.

4. Wednesday, August 30, 2023
Room 201-202
1:00 PM - 1:30 PM

Title: Not a Black Box: An Engaged Approach to Developing a Transmission Main CIP Program

Presenter:
Erin Laux
Sr. Water/Wastewater Designer, Gannett Fleming

Abstract:
The City of Norfolk desires to have a holistic understanding of their transmission system through the establishment of a long-term transmission infrastructure plan. In 2019, the City worked with the ultimate objective to develop an infrastructure plan with Capital Improvement Projects for drinking water transmission mains, focusing on the next 5 years, to be updated annually with a long-term projection to 30 years. A GIS-based pipeline-prioritization program was developed that leverages existing data and software tools to simply and efficiently establish a defendable, prioritized ranking of mains in the City to guide the transmission main CIP program. The unique aspect about this system is that the City's Engineering and Operations teams were highly engaged in each step of the development. Every decision, weighting and criteria was evaluated as an integrated, collective team, producing a tool that is not only technically defensible but has commitment by users and stakeholders in its implementation. The expertise and knowledge of the City staff were essential to the outcome of the plan. The presentation will present a description of the process utilized to complete the program and provide perspective from both the consultant and owner views.

Learning Objectives:
Identification and definition of the City's transmission system
Discuss how to develop a practical and efficient GIS-based main prioritization program
Discuss how significant coordination with City staff can be used to create a tool that will allow them to carry the priorities into the future

Biography:
Erin M Laux is one of Gannett Fleming's lead hydraulic modelers in the Water Business Line of Gannett Fleming in Harrisburg where she has worked for over 5 years upon graduating from the University of Delaware. Her primary responsibilities involve leading and performing technical studies, planning studies, and other engineering services for water and wastewater systems. She specializes in hydraulic and water quality modeling and analyses of water distribution and wastewater collection systems and asset/information management for water and wastewater systems.

5. Wednesday, August 30, 2023
Room 201-202
1:30 PM - 2:00 PM

Title: Long Term Corrosion Prevention Program - Potomac Interceptor - Using Innovative Tools to Support Strategy Development

Presenter:
Eyasu Yilma PE
Manager, Potomac Interceptor, DC Water

Abstract:
The Potomac Interceptor is a 50-mile-long DC water's Multi-Jurisdictional Use Facility. The system has suffered from conditions that caused several pipe segments to corrode. The corrosion is progressive and there is an urgent need to devise effective mitigation methods. In addition, the Potomac Interceptor used to have up to 27 odor complaints per year. To mitigate odor issues, DC Water introduced the odor control optimization program that has helped reduce odor complaints significantly by implementing measures identified in the optimization study. DC Water has been searching for a sewer processing model to determine and predict corrosion and H2S in the sewer system. Finally, a decision was made to use the WATS model. As part of the sewer processing model search, DC Water identified several methods for corrosion prevention which include biofilm cleaning, ventilation, liquid phase treatment, sacrificial concrete, and innovative repair methods. To determine the effectiveness of the above identified methods for corrosion mitigation, sewer process models were implemented to support more comprehensive institutional Business Case Evaluation Tools. A pressure study capturing the length of the PI, including eight monitoring locations with hydrogen sulfide monitoring at two of these, was conducted under various operating air flow conditions at the six Odor Control Facilities. The results from the pressure study established boundary conditions of a ventilation model domain, which included the contiguous headspace along the PI, in terms of headspace opening from the lateral connections. The Mega-WATS, an advanced sewer process modelling tool that includes ventilation was implemented to represent air pressure and flow in the PI headspace. As part of this program, defined and actionable points were identified for locations with already known corrosion issues and in need of repair. Noteworthy, a diver was sent into the PI and travelled up to 900 feet into a 54-inch pipe to conduct a point repair with a live flow at a previously identified location. Results from the pressure study compared with model-predicted results agreement with the measured data was excellent across several fan and hydraulic conditions. Hence, the ventilation model was considered sufficiently representative of real ventilation conditions that the ventilation results could be implemented in Mega-WATS for assessment Other factors being equal, corrosion is exacerbated by high air velocities. Scenarios were modelled to determine the degree to which air flow could be reduced while maintaining comprehensive depressurization of the PI headspace. The pressure testing along the PI with hydrogen sulfide monitoring provided high quality inputs to calibrate a ventilation model of the PI using Mega-Vent. This allowed DC Water to use Mega-WATS to simulate corrosion rates, to simulate hydrogen sulfide concentration, and to determine an integrated operational strategy of the Odor Control Facility optimized to minimize corrosion rates and odor problems along the PI. This presentation will describe DC Water's approach to mitigating odor and corrosion by developing sewer processing model (WATS) to predict corrosion rate and optimize odor control facility operation. The piloted corrosion mitigation measure to be presented includes point repair using diver with live flow

Learning Objectives:

Innovative pipe repair method using diver with live flow
Development of sewer processing model (WATS) to predict corrosion rate
Study Ventilation system to optimize odor control facility operation

Biography:

Eyasu Yilma is a professional engineer registered in Washington, D.C. and has 25 years of continuous successful career as a consultant in Europe, Africa and USA. He is a graduate of Addis Ababa University in Ethiopia, and has a Masters Degree from the University of Leuphana Germany, in Water Resources Management. Mr. Yilma works for DC Water as Manager for Potomac Interceptor. He authored several documents incl. Potomac Interceptor Renewal, Long Term Corrosion Prevention Program, and Multi-Jurisdictional Use Facilities Cost Share

6. Wednesday, August 30, 2023
Room 201-202
2:00 PM - 2:30 PM

Title: WSSC Siphon Facility Assessments

Presenter:
Justin Hall
Senior Associate, JMT

Abstract:
It is common in the wastewater industry to refer to pressurized sewer pipes intentionally constructed below the intended hydraulic grade line as “siphons”, but more correctly they are “depressed sewers” or “inverted siphons”. The term “siphon” is used here in the common way, as describing a depressed sewer. Due to these systems operating with the pipe(s) flowing “full” continuously, the “siphon” systems may flow at a very low velocity much of the time, and can easily accumulate debris at low flow rates. WSSC operates over 50 siphon facilities in the collection system; over 60% of these sites have at least two parallel siphon pipes. In addition to maintenance concerns, WSSC’s siphon systems are often located in areas that are very tough to access. Therefore, as a part of the Commission’s forward-thinking asset management practices, siphon site condition assessments were conducted in 2022 to identify siphon sites in need of maintenance, rehabilitation, and/or access improvements to aid in planning for maintenance activities. Because operational siphon systems can rarely be shut down for long periods of time, surface level chamber inspections and “outside the box” assessment and analysis techniques were used for this project to minimize service disruptions. Field staff used custom built mobile applications to record observations and photos regarding the accessibility of each access chamber, operational characteristics such as flow levels and debris buildup, and structural condition of the access chamber structures themselves. Presenters will explain results and conclusions made from these assessments, and will touch on next step evaluation possibilities. Two such possibilities include performing a business risk evaluation to help with prioritizing siphon asset maintenance in the future, and applying the Hazen-Williams formula to rank siphons by calculated friction factor values.

Learning Objectives:

Biography:
Mr. Hall has over 14 years of experience in engineering for water/wastewater projects for various agencies throughout Maryland and Virginia, and is a licensed Professional Engineer in Maryland, Pennsylvania, the District of Columbia and Colorado. He has worked extensively on sewer and storm drain rehabilitation projects as well as new sewer and water main design projects. Mr. Hall is a member of CWEA and is the current vice-Chair of the Government Affairs committee.

7. Wednesday, August 30, 2023
Room 201-202
3:30 PM - 4:00 PM

Title: The Perils of Surcharging Interceptors: Unintended consequences of in-line storage

Presenter:
James Shelton
National Technical Director, Arcadis

Abstract:
Utilities are more and more frequently resorting to real-time control systems that intentionally block flows in interceptors to take advantage of available in-line storage during storm surges to combat overflows from sewers. Many utilities are also more and more frequently extending their pump station's wet wells into the sewers feeding the wet well to raise NSPSH and to effectively enlarge their wet wells, improving pump performance. When hydraulic grade lines subside to normal (open channel) operating levels, the sewage pushed outside the pipes pours back into the pipe, bringing bedding fines that eventually result in pipe bedding envelope failure and pipe collapse.This paper identifies the causes, mechanisms of failure, evidence of likely failure of surcharges, inspection techniques to identify pipes at risk if surcharged, and rehabilitation methods once a pipe is thus compromised.

Learning Objectives:
Identify what types of pipes are prone to surcharge failures, and which require more than CCTV investigation it identify both risk and failures
Learn suggested assessment measures utilities can use protect themselves from these failures
Understand impact of various remediation techniques to minimize or correct impacts from surcharging

Biography:
Jim Shelton is a Vice President and National Technical Director for Buried Infrastructure for ARCADIS, focusing on condition assessment, rehabilitation, construction management, capacity assurance, operational assistance, and program development and management. He specializes in large program development and in the delivery of turnkey pipeline rehabilitation projects using Construction Manager at Risk and Collaborative Design-Build. He has a degree in Chemical Engineering from University of Pennsylvania, is a licensed water and sewer contractor in several states, and holds active Professional Engineering licenses in Civil Engineering in 14 states.

8. Wednesday, August 30, 2023
Room 201-202
4:00 PM - 4:30 PM

Title: Are Metallic Pressure Pipes Forever Assets? A Review of a Decade of Inline Condition Assessment Data

Presenter:
Eric Toffin P.Eng.
Global Product Manager - Metallic Pipelines, Xylem

Abstract:
Metallic pipes, those made up of cast iron, ductile iron and / or steel, are the most prevalent pressure pipe materials in the world. In North America they make up 60% of the water and wastewater infrastructure in the ground today. Traditionally, many utilities have been managing these aging metallic pipelines using a replacement approach, which prioritizes a pipe based on its age and failure history. In the last decade, there have been significant developments in metallic pipe inspection technologies which can be deployed into large diameter pipeline systems to provide a pipe-by-pipe understanding of their current condition. Utilities are now able to manage the risk of their large diameter metallic pipe inventory more efficiently by combining various levels of condition assessment with data analytics, pressure management, and valve assessments. Begging the question: Are large diameter metallic pressure pipelines forever assets? This paper statistically reviews data from more than 200 miles of electromagnetic and ultrasonic inspection that have been performed since 2013 to develop scientifically based conclusions on a variety of topic areas regarding the performance, deterioration, and management of steel, cast and ductile iron mains. This paper aims to benchmark the following: • The mean percent of damaged pipe sections in our dataset for large diameter metallic pipe. • Percent of damage is compared between metallic and PCCP pipes. • Percent of damage of the modern metallic pipe materials (ductile iron and steel). • Percent of damage for water (including raw water) versus wastewater mains. A short case study will also be presented demonstrating how the data collected can be utilized in degradation modeling.

Learning Objectives:
Understand available inspection technologies for metallic pressure pipes
Understand percent of damaged pipe sections typically found
Compare percent of damaged pipes in water and wastewater systems

Biography:
Eric Toffin P.Eng. is the Global Product Manager for Metallic Pipelines at Xylem. A Mechanical Engineer by training with 13+ years of technology development experience, he is now responsible for understanding client problems, providing deep product expertise, and making strategic decisions for metallic pipeline technology and management solutions. Based in San Francisco, Eric has been involved in condition assessment projects with water authorities throughout North America and Internationally.

9. Wednesday, August 30, 2023
Room 201-202
4:30 PM - 5:00 PM

Title: XDOT Large Diameter Metal Plate Arch Rehabilitation with Unreinforced Geopolymer Mortar

Presenter:
Scott Naiva P.E.
Geopolymer or not Geopolymer...that is the question!, Manufacturer of large pipeline rehab technology

Abstract:
Recently, XDOT completed their first large scale geopolymer mortar pipe rehabilitation project. This included work at 3 locations with pipes ranging from ~7’ x 10’ to 10’ x 17’ metal arches for a total of 608 LF: 1. Brick Mill Road – a triple barrel steel plate pipe arch 8'11" x 14'3" 3 pipes at 92’ = 276 LF 2. Red Mill Road – a double barrel aluminum plate pipe arch 9'11" x 16'8" 2 pipes at 108’ = 216 LF 3. Library Ave – a single barrel corrugated metal pipe arch 84.5” x 122.5" 1 pipe at 116’ = 116 LF Total = 608 LF The geopolymer liner design assumed the existing pipes were fully deteriorated and utilized the distributed beam design method requiring an unreinforced geopolymer mortar liner ranging from 2.4 to 3.2 inches thick. This created a structurally independent, corrosion-resistant, new pipe inside the old pipe structure. The successful construction project was completed in cold weather conditions in February 2022 prior to an environmental deadline to be out of the stream by March 1st. At XDOT, any culvert over 48” in diameter is considered a bridge. XDOT estimated that if they had to do 3 full bridge replacements, it would of taken 6 to 9 months minimum and had a far greater impact on the environment and the traveling public. Using accelerated bridge construction (ABC) by rehabilitation with geopolymer liner cut construction down to a total of 6 weeks. This presentation will focus on the trenchless options considered, why the XDOT selected geopolymer mortar, liner design methodology, the H&H hydraulic analysis approach, specification development, QAQC testing, internal / external bypass considerations, construction challenges and lessons learned. It will provide perspectives from the owner, the design consultant, the contractor and the material provider.

Learning Objectives:
1. educate asset owners and engineers on What a geopolymer is and how to provide apples to apples design bid documents
2. There is not currently a single agreed upon ASTM liner design standard. XDOT will cover how they got past this issue by utilizing the distributed beam design method and why
3. provide education on internal bypass reduction in community impact , go over lessons learned from contractor, engineer and asset owner prospective

Biography:
Scott Naiva, P.E. is the Northeastern Region Manager with GeoTree Solutions. (Snaiva@cs-nri.com (610-971-0362) Scott is responsible for business development of GeoTree’s GeoSpray & GeoSpray HCE geopolymer mortar.
Scott has 34 years of engineering consulting and business development experience. He has an Engineering degree from Syracuse and an MBA from Eastern University. He is an active member of 3 WEA collection committees. Scott resides in the Philadelphia area with his wife and daughter and enjoys hiking and rock wall climbing.

10. Wednesday, August 30, 2023
Room 203-204
8:30 AM - 9:00 AM

Title: Asset Protection with Appropriate Erosion Control Strategies in Flashy Streams

Presenter:
Nancy Schumm PWS, CPESC, CMSM, QPFSD
Director, Water Resources/Environmental, PRIME AE Group, Inc.

Abstract:
Linking Restoration Science and Practice to Real-life Applications - Exposed pipelines along streams pose a maintenance challenge and potential risk to the environment. PRIME AE combined asset protection and naturalized stream design to mitigate this issue when tasked to provide design protection for water mains that were present in public waterways and were compromised through age or stream migration. Approaching the design from an environmental angle provides naturalized protection strategies based upon local soils, civil engineering considerations, and erosion and sediment control strategies including vegetation reestablishment. This program features five projects beginning with site investigations, environmental conditions, historic soil issues, design limitations, public/permit considerations, construction challenges, and final implementation of design. Objectives of this presentation are to emphasize the range of environmental considerations in real world applications of engineering practices. Factoring environmental consideration in stream restoration reduces limits of disturbance at the project site, which in turn minimizes permit requirements and promotes sustainability. This results in saving time and money while improving public health.

Learning Objectives:
What is a flashy stream, How do you address the problem of exposed assets in flashy streams
What kind of permits are needed in these situations
How do you approach protection from and engineering and environmental science perspective to find solutions

Biography:
Nancy Schumm is the award-winning author of two books on natural areas and plant history and four books on regional history. She has been lecturing and presenting professional papers on environmental topics nationally and internationally since 1997. As a former business owner, and now corporate project manager, Nancy has been working on environmental water projects for over 24 years. Currently, Nancy is the Director of the environmental department at PRIME AE Group, Inc. in Baltimore, Maryland. Her department is responsible for permits, wetland and forest stand delineations, stream design and H&H, natural resource protection and making sure best management practices are in place to protect our water.

11. Wednesday, August 30, 2023
Room 203-204
9:00 AM - 9:30 AM

Title: Lessons Learned from Integrating 1D and 2D Riverine and Collection System Models

Presenter:
Mary Whitehead
Senior Water Engineer, Arcadis

Abstract:
Many communities in North Carolina and across the country suffer from routine and often severe flooding due to a combination of riverine impacts and old, undersized stormwater collection systems. But how many communities have the opportunity to developed detailed hydrologic and hydraulic models of both systems on a watershed scale? The City of Fayetteville NC had the vision and financial commitment to analyze drainage issues across all 12 of its watersheds located within the City. Arcadis was tasked with supporting the City and its program manager Freese and Nichols with performing detailed modeling of the Blounts Creek Watershed. With its 7.0 square mile area and a stream length of 9.0 river miles, it is the largest and most developed of the City's watersheds. Work included developing detailed 1D and 2D hydrologic and hydraulic models using HEC-HMS/HEC-RAS for the primary (riverine) system and ICM for the secondary (collection) system; performing a field assessment of high priority stream reaches and identifying issues and problem areas that require mitigation with new drainage solutions. The catch was the modeling work needed to be completed within 8 months. To successfully develop, validate, and integrate the 1D and 2D riverine and collection system models within such a short timeframe, the Arcadis team needed to utilize all available resources efficiently and effectively. One of the key methods used by the Arcadis team to best schedule time and resources was to couple hands-on practices with automated methods when developing the hydrologic and hydraulic model parameters. In reviewing the Standards Manual provided by the City, the Arcadis team noted places where automated tools could streamline parameter development. For example, the team created an ESRI based tool that could calculate the times of concentration for all the subcatchments and provide the data in a format that would be directly imported into InfoWorks ICM. In tandem, to ensure a quality product, the modeling team leads developed extensive QA/QC procedures for the modelers to use to validate the output from the tools. This presentation will step through the overall program and vision of the City in establishing and implementing the watershed master plan program and Arcadis' process of coupling automated processes with hands-on practices to develop, validate, and integrate the 1D and 2D riverine and collection system models within such a short timeframe.

Learning Objectives:
Benefits of holistic watershed evaluation through study of primary and secondary systems together
Efficient resource management through combination of manual and automated practices
Methods to use modeling results from multiple platforms to assess and prioritize problem areas for alternative assessment

Biography:
Ms. Whitehead manages projects for large and small utilities and has extensive hydraulic and hydrologic (H&H) planning experience. She has over 20 years experience of consulting experience focusing on hydrologic and hydraulic modelling, collection system GIS development and management, storm sewer system master planning, flow monitoring data management, and combined sewer overflow (CSO) and

sanitary sewer overflow (SSO) analysis. With her water resources background, she has developed storm sewer master plans, stormwater mitigation strategies, evaluated inflow and infiltration impacts and developed alternatives for surface flooding controls.

12. Wednesday, August 30, 2023
Room 203-204
9:30 AM - 10:00 AM

Title: Stormwater Collection & Removal of Suspended Debris, Hazardous Metals & Organics

Presenter:
James Impero Mr.
Sr. Engineering Specialist, Ovivo USA, LLC

Abstract:
Growth and advancement of society populations have created vast areas of concrete asphalt construction & expansion. This has produced vast runoff of water that calls for proper storm water management to protect vital recourses. What once was absorbed by & across vegetation, marshes, or forest floors and into our earth to replenish ground water, streams, rivers, lakes & oceans now compromises pavement roadways & infra-structure preventing the storm water from properly replenishing the earth & its natural recycling system. Proper deployment of holding ponds and/or drainage ditches to receive vast quantities of storm water requires systems & equipment to be installed to remove manmade debris, live & dead vegetation, & sediments from impeding flow. The trend today in storm water management is to remove most if not all flushed vegetation & manmade materials and objects, as well as curb the flow of hazardous dissolved organic and inorganic chemicals washed into our waterways from streets, highways, & bayous leading to our rivers, lakes, reservoirs & oceans. This debris not only causes flooding due to sediment & trash accumulation, but increases turbidity in our waterways from stirred sediment, habitat destruction, erosion, & sewer overflow. This paper will discuss low operator attendance methods for keeping debris from clogging surface drainage ditches, holding ponds, large concrete pipe, as well as deep tunnel collection & pumping systems. It will provide data & information on low operator attendance collection, filtration, screening, API settling & vortex capture methods, as well as automated chemical injection, flocculation & membrane removal of hazardous organic & inorganic chemicals at fixed collection, treatment & discharge facilities.

Learning Objectives:
To understand where & how flooding, soil erosion, and debris contaminated waterways have become problems with origins generated by residential & commercial growth & expansion.
To understand point source versus facility collection & debris removal systems that assist in keeping flow from backing up and flooding the surrounding and/or downstream environment.
New PPt-SiC treatment systems will also be discussed in removal of hazardous storm water contaminants; i.e. heavy metals, bacteria, pesticides, pharmaceuticals, personal care products, & surfactants

Biography:
I James Impero have been in the research & develop team improving waste water and water treatment screening & filtration designs, testing site installations and developing protocols for product lines for 16+ years. I have been site testing, developing data, improving equipment designs and writing abstracts and papers to document the company's goal in becoming leading experts in the field of water and waste water treatment and design.

13. Wednesday, August 30, 2023
Room 203-204
1:00 PM - 1:30 PM

Title: Identifying Reliable Solids Management Options for the Parham Landing WWTP

Presenter:
Lisa Challenger
CEO, Material Matters

Abstract:
New Kent County owns and operates the Parham Landing Wastewater Treatment Plant, which produces 1.8MM gallons of liquid, unstabilized wastewater solids each year. The solids are transported by a contracted hauler to two local wastewater treatment plants. Relying on other utilities for solids management has proven to be challenging due to limited outlet options, lack of reliability, and fee increases. Recognizing existing constraints, the County selected the Arcadis/Material Matters (MM) team to lead a Solids Dewatering and Management Project to select a solids dewatering technology and understand alternative solids stabilization technologies. MM led the Biosolids Market Assessment and regulatory evaluation to provide support to the County to better understand the demand for various biosolids products in the region. The Assessment included a review of the County's baseline solids management program, and an assessment of regulations and outlets for unstabilized cake, Class B, and Class A Exceptional Quality (EQ) products produced by considered processing technologies. Findings revealed management of unstabilized cake via landfill disposal will be costly and unreliable, with only a small fraction of landfills showing a willingness to accept cake. However, the assessment identified a unique opportunity for cost-effective management of unstabilized cake via a merchant composting facility, located just 30 minutes from the WWTP – an option that is both reliable and allows for beneficial use. The project also identified robust opportunities for Class A/EQ compost, and Class A/EQ and Class B cake products. This presentation will discuss the Market Assessment approach and detailed market findings uncovered during the project.

Learning Objectives:
Identifying potential solids management options
Landfill disposal is becoming increasingly challenging and costly
Unique biosolids management options can be identified

Biography:
Lisa began working at Material Matters in 2013, and currently serves as CEO. She has experience in marketing, permitting, and managing biosolids and residual materials in more than 25 states. In her spare time, she enjoys hiking in the woods with her husband and two kiddos - James and Cooper. Lisa graduated from Penn State in 2012 with a BS degree in Environmental Resource Management.

14. Wednesday, August 30, 2023
Room 203-204
1:30 PM - 2:00 PM

Title: Enhancing Anaerobic Digestion Performance with the Microbial Hydrolysis Process

Presenter:
Dave Parry PhD, PE, BCEE
Vice President; Senior Research Fellow, Jacobs

Abstract:
This paper presents a novel technology called the Microbial Hydrolysis Process (MHP), an innovative technology that enhances anaerobic digestion (AD) performance to the highest level achievable to date. Typical AD systems can achieve up to 60% volatile solids reduction (VSR), and no system, until now, has achieved over 70%. In lab- and pilot-scale studies conducted by Jacobs on sludge from three WRRFs, the addition of MHP consistently resulted in VSRs exceeding 75%. MHP was developed by Jacobs with professors at Brigham Young University. The process uses Caldicellulosiruptor bescii (C. bescii), a bacterium that hydrolyzes cellulose and other recalcitrant organics into volatile acids that are more readily digestible in conventional AD processes. In MHP, raw or digested sludge is fed to a tank populated with C. bescii for a retention time of two days at 75 C. The hydrolyzed sludge is then fed to an anaerobic digester, where the volatile solids are converted to biogas by methanogens. Jacobs tested MHP in lab- and pilot-scale systems on solids from three WRRFs with well-performing conventional AD processes. The lab-scale system consisted of a test and control system, each with a 10 Liter (L) digester and a 5L hydrolysis tank. The pilot-scale system consisted of a test system with a 1,200L digester and a 500L hydrolysis tank and a control system with a 1,200L digester. All tanks were mixed, heated, and automatically fed from digester feed tanks. The test and control systems were operated to simulate the full-scale digester operation for feed rate and retention time. Laboratory analyses were conducted using standard methods. Volatile solids and total solids were measured to monitor digester performance, and the stability of the digesters was monitored by measured volatile fatty acids, alkalinity, and ammonia. The VSR of the digesters was the key indicator of performance and was determined from the total and volatile solids fed to the digesters compared to the total and volatile solids withdrawn from the digesters. In all cases, VSRs increased from 58-60% without MHP to greater than 75% with MHP. The increase in VSR corresponded to a 25% increase in biogas production and a 25% decrease in biosolids production. The value of the additional biogas and cost savings of producing less biosolids substantially reduces operating costs of a WRRF.

Learning Objectives:
To inform the audience of an innovative technology that significantly enhances anaerobic digestion
To educate the audience on the benefits of improving biogas production as a means to reduce a plants' carbon footprint
To educate the audience on considerations when transitioning from pilot-scale testing to full-scale implementation of a new technology

Biography:
Dr. Dave Parry has an international reputation for providing proven innovative solutions in wastewater, biosolids, and energy. He has 40 years of experience in planning, designing, researching, and providing construction and operation assistance for wastewater treatment, solids processing, and energy projects. He has been principal investigator for research on anaerobic digestion, co-digestion, pyrolysis,

gasification, and combustion, and is the inventor and principal investigator for Jacobs' Microbial Hydrolysis Process

15. Wednesday, August 30, 2023
Room 203-204
2:00 PM - 2:30 PM

Title: Phosphorus in the Circle of Life - A Holistic Approach to Corrosion Control and Water Quality

Presenter:
Matthew Tyrrell
RSM, AquaSmart Inc

Abstract:
Up to 35% of existing wastewater phosphorus load comes from drinking water corrosion control. An anticipated impact of the lead & copper rule is an increase in both the overall use and concentration of corrosion additives. Looking towards the UK, who's about a decade ahead of the US, we can make better informed decisions based on learnings that have taken place. One such learning is utilizing an equilibrium-blended phosphate, which in some applications can control lead corrosion using up to 90% less phosphorus.

Learning Objectives:
Have a greater understanding of the phosphorus cycle from cradle to grave and how it flows through the drinking and wastewater treatment cycles
A guide to corrosion inhibitor decisions, including the upcoming lead and copper revisions and how corrosion control treatment decisions effect overall chemical usage for the entire treatment process
Using real world examples including case studies out of the UK and the Chesapeake Bay to understand the real world impacts of decisions around optimal corrosion control treatment

Biography:
Have been in the water business around 7 years, starting my career in the water industry with Hach. Former Marine Sgt and OIF veteran who honorably served. Having spent 5 years as an aviation hydraulic mechanic. Upon completion of my tour of duty, used the GI Bill to obtain a Mechanical Engineering Bachelor of Science Degree from Drexel University. Currently reside in Philadelphia, PA with my wife and two step-daughters who live near us.

16. Wednesday, August 30, 2023
Room 203-204
3:30 PM - 4:00 PM

Title: More nutrient removal without carbon addition - An Overview of various process pathways taken by US facilities

Presenter:
Tanja Rauch-williams
Wastewater Process and Innovation Lead, Carollo Engineers

Abstract:
The activated sludge process is an important process providing removal of COD, ammonia, nitrogen (N), and phosphorus (P) in biological nutrient removal (BNR) processes. However, aeration at >1.5 mg DO/L limits effective utilitization of wastewater derived carbon for biological nutrient removal and utilizes ~50% of the total energy demand at WRRFs. As part of a Department of Energy project on suboxic nutrient removal (previously presented on at this conference) our team conducted a survey on Water resource recovery facilities (WRRF) in North America that are operating at low DO concentrations to improve nutrient removal and reduce energy input. We conducted a survey on applicable facilities and completed more than 15 detailed surveys and interviews. The participating WRRFs range in size, location, and process configurations. All supplied data on their influent and effluent characteristics as well as nutrient removal efficiency, activated sludge operational parameters like DO concentrations, settleability, and SRTs. The WRRFs also supplied information on lessons learned, operational challenges, and potential solutions. This presentation will summarize, categorize, and compare the different pathways utilities have chosen to reduce DO concentrations in their BNR processes and the results that were achieved for nitrogen and phosphorus removal efficiency. Sharing this information can stimulate other WRRFs to implement modified treatment schemes to increase nutrient removal without costly carbon addition and reduce energy input, and lower O&M costs.

Learning Objectives:
Understand different pathways utilities have chosen to reduce DO concentrations in their BNR processes.
Learn the relationship between low DO aeration control and nutrient removal.
Stimulate other WRRFs to implement modified treatment schemes to increase nutrient removal without costly carbon addition and reduce energy input, and lower O&M costs

Biography:
Dr. Tanja Rauch-Williams serves as Carollo's National Wastewater Process and Innovation Lead and Principal Technologist with more than 20 years of experience in wastewater treatment, water reuse and applied research. Her work with utilities across the U.S. has advanced water reuse, nutrient removal and energy optimization, codigestion, and trace organic removal.
Tanja is vice-chair of WEF's Municipal Resource Recovery Design Committee, and founding member of the Rocky Mountain Innovative Water Technologies Committee under RMWEA.

17. Wednesday, August 30, 2023
Room 203-204
4:00 PM - 4:30 PM

Title: Compact, energy-efficient and chemical-free Biological Nutrient Removal using AquaNereda® Aerobic Granular Sludge Technology

Presenter:
Joe Tardio
Product Manager - AquaNereda, Aqua-Aerobic Systems, Inc.

Abstract:
The AquaNereda® technology provides advanced secondary wastewater treatment using the unique features of aerobic granular biomass composed of granular sludge. One of the main characteristics of aerobic granular sludge is its outstanding settling properties. Based on the density of the granules, granular biomass settles significantly faster than flocculent sludge. These excellent settling properties lead to lower volumes required for treatment. The ability to achieve biological nutrient removal in a single tank concept, with no sludge recirculation, efficient use of oxygen and fast settling, makes the AquaNereda technology ideal for advanced secondary treatment in a small footprint with the lowest lifecycle costs.

Learning Objectives:
understand the major benefits of aerobic granular sludge
understand the mechanisms for biological nutrient removal in the AquaNereda system

Biography:
Joe is the Product Manager for AquaNereda® at Aqua-Aerobic Systems, Inc. He holds a Bachelor's Degree in Biological Sciences and Chemistry from the University of Delaware and a Master's Degree in Environmental & Waste Management from Stony Brook University. Joe has management experience with a broad range of innovative water and wastewater treatment technologies, including biological, filtration and separation products and has been in the water and wastewater industry since 2006 and is a Board-Certified Environmental Scientist (BCES) from the American Academy of Environmental Engineers & Scientists.

18. Wednesday, August 30, 2023
Room 203-204
4:30 PM - 5:00 PM

Title: Enhanced Biological Nutrient Removal with Minimal Recycle Flows in a Phased Activated Sludge System

Presenter:
Manuel De Los Santos
Product Manager - Biological Processes, Aqua-Aerobic Systems, Inc.

Abstract:
Flow through activated sludge systems have been the prevalent technology for over 100 years for wastewater treatment, and has evolved to meet stringent biological nutrient removal (BNR) requirements with multi-stage approach. The PASS is a flow-through process that employs time-managed control for nutrient removal. The system offers a load-proportioned mode via a staged aeration system, significantly reducing sludge recycle pumping requirements. In contrast to typical arrangements, the RAS from the final clarifier is thickened by the Phase Separator and conditioned by a Pre-Anoxic reactor prior to reintroduction to the Anaerobic reactor. With elevated substrate levels and pre-fermentation, the anaerobic reactor's volume is minimized and the production of short chained fatty acids is accelerated for enhanced BioP removal. Wastewater continues to completely mixed Staged Aeration Reactors, featuring independent control of aeration, creating aerobic and anoxic events which allows adjustment in response to elevated nitrate or ammonia levels to achieve effective TN removal. This paper will cover details of the operation of the system, as well as performance on existing plants in the US.

Learning Objectives:
How to achieve biological nutrient removal in a treatment plant
Understand the time-based operation for total nitrogen removal
Learn how pre-fermentation can help enhance biological phosphorus removal

Biography:
Manuel possesses a M.S. degree in Sanitary and Environmental Engineering from the Universidad de Cantabria, Spain. He also has a B.S. degree in Civil Engineering from Santo Domingo, Dominican Republic. Manuel has worked in the wastewater treatment industry in application engineering for over 20 years with skills in design, application and technical support for biological processes and membranes. He also possesses two years of consulting engineering experience in the construction field.

19. Wednesday, August 30, 2023
Room 207-208
8:30 AM - 9:00 AM

Title: Rehabilitation of a Potable Water Tank with Limited Access and Lead Coating Removal

Presenter:
Heather Stiner
Business Development Manager, Sherwin-Williams

Abstract:
This presentation will review a case history of a project that consisted of rehabilitation of an existing potable water tank that had an existing lead coating system and limited access. Topics that will be discussed are: Working within constrained areas due to the tank being placed in the middle of campus, being surrounded by buildings; Requirements when dealing with lead removal; Requirements for interior of potable water tank coatings; Requirements for exterior coating system. The discussion will walk them through the project from start to finish with discussion of difficulties and hurdles that had to be overcome to have a quality job finished on time and per procurement documents.

Learning Objectives:
Define requirements for working within constrained areas
Define requirements for removal of lead coatings per Federal, State and Local regulations
Define requirements for interior potable water tank coating systems and exterior coating systems

Biography:
Ms. Heather Stiner is a 1997 graduate of the University of Pittsburgh where she studied chemistry. She has been with Sherwin-Williams since 2018 and has held roles as dedicated water/wastewater sales representative and business development manager for water and wastewater in the Eastern area division.
Prior to working for SSPC, Heather began her career at PPG Industries, where she worked in the General Industrial Lab as a Quality Assurance Technician. She left PPG to accept a position with Sauereisen Incorporated as the firm's Organic Chemist, where she formulated coatings for the protective coatings industry. In 2006 she progressed her career at SSPC: The Society for Protective Coatings in a role as protective coatings professional, serving as the staff technical expert on coatings.
At SSPC, in addition to her duties as a staff technical expert, Heather functioned as both an instructor and contributing author for several SSPC training courses, as well as delivering technical presentations at various conferences and writing articles for the JPCL.
Ms. Stiner holds three widely recognized certifications in the coatings industry: SSPC Protective Coatings Specialist (PCS) and the SSPC Concrete Coatings Inspector (CCI) and NACE Coatings Inspector Program (CIP) Level 1. She is also a member of the SSPC, the American Chemical Society, NACE, ASTM, ISO US TAG TC 35.

20. Wednesday, August 30, 2023
Room 207-208
9:00 AM - 9:30 AM

Title: The Maryland Statewide PMP is Here! How the Probable Maximum Precipitation (PMP) Study is Impacting Design Storms for Dams

Presenter:
Kate Naughton PE, CFM
Principal Engineer, Hazen and Sawyer

Abstract:
According to the Maryland Department of the Environment Dam Safety Program (MDE DSP) regulations, high hazard dams are required to pass 100% of the Probable Maximum Flood (PMF) or "most severe flood considered possible in a specific region." The PMF results from the most severe combination of meteorologic and hydrologic conditions possible within a given drainage basin. Since the 1980s, the meteorologic component, also known as the probable maximum precipitation (PMP), has been estimated using Hydrometeorological Report Nos. 51 and 52 (HMR 51 and 52). However, recent advancements in technology and storm tracking have allowed more precise, state- and site-specific PMP studies to be performed. In December 2020, the MDE DSP announced that it had been awarded funding from the Environmental Protection Agency to develop a PMP study for the state of Maryland. Using a dam in western Maryland as a case study, this presentation will provide results of various approaches for determining spillway rehabilitation design capacity. While the discussion will focus on the comparison of HMR 52 and the new Maryland statewide PMP study results, findings from the Virginia and Pennsylvania statewide PMP studies and their applicability to the site will be presented. Impacts to the proposed rehabilitation design as a result of the newly published statewide PMP study and future climate change will be discussed. Implications of the statewide methodology on dam regulation as well as trends in analysis across the state will also be addressed.

Learning Objectives:
Understand the methodology commonly used to estimate dam spillway design storms.
Understand how the new statewide PMP study can impact spillway rehabilitation alternatives through case study.

Biography:
Kate Naughton is a Principal Engineer at Hazen and Sawyer and has over eight years of dam safety experience. Her specialties include performing hydrologic and hydraulic (H&H) analyses for various types of water resources and hydraulic structure design projects; preparing Operation and Maintenance (O&M) Manuals and Emergency Action Plans (EAP) for dams; facilitating EAP Drills, Seminars, Tabletop Exercises, and Functional Exercises; estimating reservoir safe yield; conducting dam inspections and assessments; and researching historical dam failures. In addition to holding her Professional Engineering (PE) license in Pennsylvania, Maryland, Virginia, and Georgia, she is a Certified Floodplain Manager (CFM) and is active in multiple associations. In 2022, Kate received a Young Professional Engineer of the Year Award from the Association of State Dam Safety Officials (ASDSO).

21. Wednesday, August 30, 2023
Room 207-208
9:30 AM - 10:00 AM

Title: Why Should I Give a Dam? Dam Safety 101

Presenter:
Kate Naughton PE, CFM
Principal Engineer, Hazen and Sawyer

Abstract:
Dams are critical assets for water supply, flood risk management, and recreation. Dams also represent a significant financial liability in terms of operation and maintenance costs and the risks of dam failure which would impact both downstream properties and those dependent on the water resource. While many dams appear to be in good operating condition on the surface, issues and signs of distress are often overlooked. Early identification and mitigation of unusual conditions can play a significant role in managing risk. During this presentation, attendees will learn about the basics of dam safety through discussion of the following topics: 1. How dams are classified from a risk perspective, 2. Different types and typical features of dams, 3. How dams can fail, 4. Internal workings of spillways, seepage through embankments and foundation, and potential hidden issues that can develop (i.e. seepage, internal erosion, pipe failure, slope stability, hydraulic capacity, etc.), 5. Using dam assessments to help identify, evaluate, and mitigate issues before they become serious problems, and 6. Preparing and exercising dam emergency action plans (EAPs) for use during emergency conditions, should they occur. This presentation will convey the importance of developing and maintaining a routine Operation, Maintenance, and Inspection (OM&I) and EAP exercise program for all dams through education on dam classification, type, failure modes, assessments, and emergency preparedness.

Learning Objectives:
Understand the importance of operation, maintenance, and inspection as well as emergency preparedness for dams.
Understand dam classifications, types, and potential failure modes.
Understand the keys to performing dam assessments to identify potential issues.

Biography:
Kate Naughton is a Principal Engineer at Hazen and Sawyer and has over eight years of dam safety experience. Her specialties include performing hydrologic and hydraulic (H&H) analyses for various types of water resources and hydraulic structure design projects; preparing Operation and Maintenance (O&M) Manuals and Emergency Action Plans (EAP) for dams; facilitating EAP Drills, Seminars, Tabletop Exercises, and Functional Exercises; estimating reservoir safe yield; conducting dam inspections and assessments; and researching historical dam failures. In addition to holding her Professional Engineering (PE) license in Pennsylvania, Maryland, Virginia, and Georgia, she is a Certified Floodplain Manager (CFM) and is active in multiple associations. In 2022, Kate received a Young Professional Engineer of the Year Award from the Association of State Dam Safety Officials (ASDSO).

22. Wednesday, August 30, 2023
Room 207-208
1:00 PM - 1:30 PM

Title: (Part 4) - Construction management of Lead Service Replacement Programs – Just How Do We Get This Done?

Presenter:
James Dudley
Construction Manager, Mott MacDonald

Abstract:
Lead service replacement programs are by their very nature repetitive and data intensive. Each address is a small construction project with sediment and erosion control, maintenance of traffic, permitting and the replacement work. A utility has several ways to contract for this type of work and these options may dramatically impact how efficiently the work is completed. Utilities contracting for this work to be done could consider three possible opportunities including indefinite delivery/indefinite quantity (ID/IQ), cost plus contract, and time and material contract. Each type of contract has its own advantages and risks. This presentation reviews some of the factors that make these contracts abnormally complicated. Some factors that add complexity to construction management of lead replacement include, prioritization of vulnerable and disadvantaged communities, inspection oversight, sequencing construction activities with customer participation, accurate invoice management, and updating the Service Line Inventory. Finally, the presentation will illustrate the digital tools used for efficient collection of construction related data. The tool was developed specifically to lead replacement programs for accurate monitoring of test pitting results, point of entry inspections, LSR replacements, and final restoration. The digital application in construction management allowed for integration into preexisting systems, timely execution decision, and accurate update to the lead inventory database.

Learning Objectives:
Understand the impact of contract strategy on lead service program replacement goals.
Examine lessons learned surrounding the complex realities of lead replacement construction in an EPA compliant program.
Develop a construction management plan with integrated data management that supports program objectives, lead inventory goals, and communication strategy.

Biography:
James Dudley has diverse experience in construction and project management. He served as the construction manager on the DC Water Lead Free Program, executing over 1000 lead service line replacements the first year of the program, prioritizing social equity and the vulnerable disadvantaged population. Mr. Dudley is a proven leader in operational planning and project management. Mr. Dudley is a combat veteran and Infantry Officer in the United States Army,

23. Wednesday, August 30, 2023
Room 207-208
1:30 PM - 2:00 PM

Title: Lead and Copper Rule Revisions – Baltimore's implementation strategy in meeting and maintaining compliance

Presenter:
Golnaz Khorsha
Engineer II, Baltimore City

Abstract:
In December 2021, the environmental protection agency (EPA) published the lead and copper rule revisions (LCRR) to protect the public from exposure and ingestion of lead from drinking water. As part of this revision, large utilities (i.e., serving ≥10,000 residents) are required to publish a detailed inventory of service lines with material designation. Unlike previous versions, LCRR requires utilities to view service line in continuum and extends their responsibility beyond the public side (service line connecting water main to meter) to inventory and replace the private segment of service line, defined as portion of main connecting the water meter to customer's point-of-entry (POE). The new LCRR within Baltimore City mainly translates into completing an inventory of more than 400,000 service lines. This presentation will provide an overview of Baltimore's programmatic strategy in ensuring compliance with LCRR inventory guidelines, as well as discussing City's efforts in paving the way to easily integrate future LCR-Improvement requirements, such as replacement, testing, and corrosion control. Challenges and opportunities available to utilities to fund and initiate projects to ensure compliance by deadline of 10/16/2024 will also be discussed. Baltimore's approach included engaging different City agencies to establish a preliminary service line inventory, coordination with local, state, and federal stakeholders, including Maryland Department of Environment (MDE) and EPA, reaching out to other similar size utilities to learn from their past experiences and challenges, and identifying different funding opportunities to comply with LCRR requirements. To establish the preliminary service line inventory, Baltimore City leveraged its long-standing policy of removing lead and galvanized service line from its inventory on the public side (from the water mains to individual water meters) and conducted internal reviews of records, such as as-built drawings, housing permits, water mains installation reports, and similar historical record. Baltimore then used that information to predict the material of the private side of the service lines (from individual meters to POE) and set up the preliminary inventory. Baltimore is working, in consultation with MDE, on complementing the preliminary inventory with customer engagement, predictive modeling, and field investigation to improve the level of confidence in collected data, verifying the materials predictions on the private side of the service lines, and proactively replacing identified lead and/or galvanized lines from its network. In addition, Baltimore took a proactive approach to secure adequate funding and contractual means in advancing towards LCRR compliance including setting up a preliminary budget, initiating a dialog with EPA and MDE to discuss available funding opportunities, the urgency and time limitations to comply with LCRR requirements, and the required steps to expediate the processing of funding applications to be able to meet the stipulated October 2024 deadline. Moreover, Baltimore's proactive approach included issuing emergency funding authorization to negotiate scopes of work with consultants and vendors prior to disbursement of potential grants for field investigation, predictive modeling, and proactive replacement of service laterals. Another challenge facing Baltimore as well as other utilities and residents is the potential presence of lead within internal building plumbing, conducting representative testing, and corrosion control. Baltimore is currently investigating public outreach strategies to inform residents of the negative health impacts of lead in

internal plumbing (if identified), and is exploring potential grants and devising mechanism to facilitate replacement of internal plumbing through other resources.

Learning Objectives:

How to develop a detailed service line inventory for LCRR with existing Core-data limitations facing many utilities?
How to pursue projects and establish contractual means on a limited time and budget?
Beyond Point-of-Entry - what to do about lead in internal plumbing?

Biography:

I am an environmental engineer, with a fundamental in chemical engineering. My academic background extends to reduction of sanitary sewer outflows and removal of pollutants in stormwater runoff in urban areas. I have been working within Baltimore City DPW Office of Asset Management with a focus on water projects.

24. Wednesday, August 30, 2023
Room 207-208
2:00 PM - 2:30 PM

Title: Smart Program Management for Lead Service Replacement

Presenter:
Teresa Wong P.E.
Program Manager, Ramboll

Abstract:
In 2019, DC Water launched the Lead Free DC Initiative to accelerate replacement of the estimated 28,000 lead service lines in Washington, DC, by 2030. This replacement work has been phased for execution between Fiscal Years 2021 and 2030. DC Water started with targeting customer-initiated lead service replacements (LSRs) and opportunistic LSRs through small diameter water main renewal and emergency repairs. DC Water has since escalated to large-scale replacement through block-by-block LSRs and LSRs with water main renewal. DC Water will also concurrently resolve service lines with unknown pipe material. Within the first two years, DC Water had the ambitious goal of increasing LSRs by a factor of 3. Limited by resources and time, DC Water developed a digital framework to optimize workstreams, monitor progress, and facilitate community engagement. Leveraging digital tools and automation, DC Water implemented Smart Program Management with the added benefits of near real-time metrics reporting, data-driven program strategy, and increased transparency for public education. This presentation will discuss DC Water's modular approach to implement Smart Program Management, specifically: Module 1: Tabular LSR repository with workbook of reports. Module 2: Data organization, automated workstreams, and automated customer notifications. Near-real time metrics reporting. Module 3: Relational database with enhanced functionality and reporting capabilities. Digital tool selection and customization, resourcing, and phasing will be discussed. The varied approaches for design and permitting, construction, and customer engagement will be presented.

Learning Objectives:
Case study in Smart Program Management for lead service replacement.
Modular approach to implementing digital tools.
Strategies for near real-time metrics reporting, data-driven program strategy, and transparency for public eduation.

Biography:
Ms. Teresa Wong has eleven years of experience in the environmental engineering field, including water pipelines and networks, water resources, information management, and regulatory compliance. She is a program manager and senior advisor to the Lead Free DC Initiative in Washington, DC. Ms. Wong received her B.S. in Environmental Engineering from Cornell University and is a registered Professional Engineer in Maryland.

25. Wednesday, August 30, 2023
Room 207-208
3:30 PM - 4:00 PM

Title: (Part 1) Estimating the costs for a Lead Service Replacement Program – What Can You Expect?

Presenter:
Craig Benson
Vice President, Mott MacDonald

Abstract:
The EPA has strengthened their requirements for the lead and copper rules. While the EPA has offered opportunities for grant funding to support this work, you will need a starting point. How much is this all going to cost? Depending upon the number of lead service lines that need to be replaced, this could be one of the largest capital programs your utility will encounter. This presentation is not going to tell you how much it will cost but it will give you an idea of what you should consider when building your program. We will provide rough estimates from five medium to large utilities using key factors that should be considered as part of your utility's capital planning programs for this work. The AWWA (American Water Works Association) has noted that a single LSRs can range from $5,000 - $6,000. However, that is merely the capital costs for the work completed. This does not include the countless hours necessary to identify, schedule, permit and manage the gigabytes of data associated with this work. These 'up-front' or 'hidden' costs to get your team to the point where you are actually replacing existing lead services can have a significant impact on the program cost. Key factors that will be discussed include: • Program management • Data management • Utility ownership and legal issues • Communication Efforts • Permitting Requirements • Construction Management • Final Restoration (External/ Internal)

Learning Objectives:
Understand the 'hidden' costs associated with a Lead Service Replacement Program
Understanding what the level of effort is associated with staffing
What are some of the communication and restoration costs associated with the Lead service replacement program

Biography:
Mr. Benson's expertise includes the management of project teams to delivering projects and programs. With over 30 years of experience in the water industry, he has actively managed water and wastewater treatment, distribution, and collection projects from study to final punch-list.

26. Wednesday, August 30, 2023
Room 207-208
4:00 PM - 4:30 PM

Title: (Part 2) – Lead Service Replacement Program – Using Data to Inform the Utility, the EPA, and the Public

Presenter:
Marco Hernandez Data Analyst
Data Analyst Specialist, Mott MacDonald

Abstract:
The starting point for revisions to the EPA's lead and copper rule is the requirement to document the water service lines in a utility's distribution system. As required, the utility database should be ready by October 2024 and include material classifications and ownership of all service lines in the system. Depending upon the number of lead services that need to be documented, this could be one of the largest data capture and management programs your utility may encounter. This presentation outlines some of the approaches that we have undertaken to build out those databases and help our clients get to a high level of confidence in their databases. Items that a utilities Lead Inventory Team may need to consider include machine learning, selective test pitting, predictive models, and water quality testing. Furthermore, new tools are entering the market offering the promise of greater visibility for these buried assets. Ultimately, the data collected will have to be effectively managed as new data is added from replacements made or from confirmation provided through test pits and other fieldwork. z While the development of public and EPA-facing dashboards is possible, this may create a sense of false confidence for customers. The language used by various utilities will be used to illustrate options that may be considered to signal your level of confidence will be considered.

Learning Objectives:
What is your starting point and what is the best way to build out what is needed
Database presentation to the utility, the EPA, and the customers
What is the appropriate language to use to signal to the customers your confidence level in their service material

Biography:
Mr. Hernandez is a valuable member of Mott MacDonald's Moata Insights team in collecting, processing, transforming, and visualizing data from various sources to provide useful insights on different types of client projects within Microsoft Power BI. He has an extensive background in supporting clients and shareholders.

27. Wednesday, August 30, 2023
Room 207-208
4:30 PM - 5:00 PM

Title: Lead & Copper Rule Crisis Communications: How to Successfully Handle Newsmaking Public Notifications in as Little as 24 Hours

Presenter:
Mike Mcgill
President, WaterPIO

Abstract:
When notified of a Lead and Copper Rule exceedance, a utility faces its most difficult public communication challenge. And under the LCR, exceedances are more likely; one estimate is 40% more likely. This presentation will show utilities how to communicate lead discoveries or exceedances when all the pressure is on.

Learning Objectives:
Attendees will learn how to handle public communications for a systemwide LCR exceedance before and after the new LCR is implemented, including the use of emergency notification systems
Attendees will learn how to crisis communication plans that will ensure compliance with the new LCR during its most difficult public notification requirement.
Attendees will learn how to manage press, elected official, community leader, and customer reaction to an announcement of a systemwide LCR exceedance

Biography:
In 2017, Mike McGill founded WaterPIO, a national public communications firm dedicated to affordably helping water and wastewater utilities of all sizes improve their customer, media, and crisis communications. The firm currently works with clients providing services to customers in more than a dozen states.
In recent years, guiding providers through PFAS discoveries and Lead and Copper Rule compliance have become core businesses. In 2021, McGill launched LeadCopperRule.com to help water utilities of all sizes successfully handle the MANY public communication challenges created by the new LCR.
In Fall 2022, WaterPIO launched PFASComms.com to help water and wastewater service providers in all situations publicly communicate about PFAS as they deal with the negative impacts of the EPA's Health Advisories, proposed PFOA and PFOS MCLs, and the UCMR 5 testing discoveries.
Before starting WaterPIO, Mike directed public information and customer service operations for major water and wastewater utilities for a dozen years. He served as the spokesperson for the Washington Suburban Sanitary Commission from 2007 to 2010.

McGill holds a Dual Degree in Broadcast Journalism and Political Science from Syracuse University. He began his career as a news writer and producer with CNN and National Journal's Hotline, and was the Planning Editor for WUSA-TV, the CBS station in Washington, DC.

28. Wednesday, August 30, 2023
Room 215
8:30 AM - 9:00 AM

Title: Use of BIM 360 and Generative Design for Project Delivery

Presenter:
Victoria Botto
Water/Wastewater Engineer, Stantec

Abstract:
Designing in BIM 360 allows federation of AutoCAD and Revit drawings from various disciplines into a holistic model that allows real time visualization of problems by engineers, contractors, and operators during design and construction. Other well-known benefits of BIM360 include; a user-friendly interface that simplifies the markup process for reviewers, facilitation of constructability reviews, and universal cloud-based data to support global 24/7 collaboration. There are also many other advantages this software has that may be underutilized during each stage of project delivery. Building on Artificial Intelligence and Machine Learning BIM 360 has the capability to produce generative designs through Dynamo, a graphical programming tool by Autodesk. The tool allows users to set multiple design objectives and boundaries, produces thousands of outputs and selects optimized outputs to automate aspects of the design process. Multiple preliminary designs are produced in the amount of time it would take an engineer to work through one. When used in preliminary design, this can allow design teams to innovatively think outside the box, rapidly consider different project priorities in design and construction and generally evaluate solutions which may not be possible without computational support. A generative design tool is being developed for Louisville MSD's Morris Forman Biosolids Project to evaluate the current site design and produce alternate site plans to minimize construction and operating costs while maintaining operational efficiency.

Learning Objectives:
Maximizing use of BIM 360
Using generative design
Encouraging design collaboration

Biography:
to be provided

29. Wednesday, August 30, 2023
Room 215
9:00 AM - 10:00 AM

Title: Assessing the Ethics of AI in Water

Presenter:
Sheela Lal

Abstract:

Learning Objectives:

Biography:
Sheela Lal currently manages BlueConduit's relationships with public sector entities, elected officials, regulatory agencies, state revolving funds, nonprofit and philanthropic organizations. Since joining BlueConduit, she has succeeded in developing engagement and education strategies with state and local government agencies, greatly expanding awareness for the role of data science in Lead Service Line replacement activities. She holds an MBA from the University of Michigan, a BS in Statistics and a BA in International Studies, both from the University of Missouri.

30. Wednesday, August 30, 2023
Room 215
1:00 PM - 1:30 PM

Title: 70 Broken Valves – Which Valve do I replace first?

Presenter:
Claire Chen
Project Engineer, Mott MacDonald

Abstract:
Have you ever been in a situation where an emergency water main shut down is needed but the isolation valves are not operable? There is no doubt that having working valves in the distribution system is important for daily operation and maintenance. A water utility may have a routine valve exercise program to exam and identify broken valves in the system. But what do we do with the large number of identified broken valves? Imagine a utility with over 70 critical broken valves that are beyond repair and need to be replaced. Which valves do we replace first? And how to strategically manage the replacement with limited budget and resources? To assist the capital planning of the critical valve replacement for DC Water, we developed prioritization criteria and a ranking system for valves and the top ranked valves are prioritized for replacement first. With the input of field operations and engineering, a set of 10 criteria were developed based on hydraulic benefit, system outage impact, material availability, permitting etc. Each criterion is assigned a weight percentage. The scoring system was also developed, and key stakeholders were asked to score each valve based on the criteria. In total, 70 critical valves were ranked based on the criteria and scoring system. The ranking allows us to determine the top 20 critical valves for replacement in the first year with the available budget and resources. The remaining valves were then prioritized for years 2 and 3 respectively. Overall, the valve prioritization process helps capital planning to a great extent by strategically selecting the top critical valves to replace in the first year. This presentation will include: 1) A brief introduction of the valve exercise program and the importance of valves in the distribution system. 2) A unique approach to rank and prioritize critical broken valves based on the criteria and scoring system 3) Examples on how the valve prioritization can help budget allocation for capital improvements.

Learning Objectives:
valve replacement
prioritization
criteria

Biography:
I'm a licensed professional enginner with 8 years of experience in water/wastewater industry. Specialized in water infrastructure planning and distribution system modeling. Adept at providing technical support for a variety of environmental engineering projects, including water treatment facilities, water distribution system, sewer collection system, water storage facilities and pump stations. Well experienced in comprehensive master planning, sewer mainline design, hydraulic analysis, project management and permitting.

31. Wednesday, August 30, 2023
Room 215
1:30 PM - 2:00 PM

Title: Introduction to SCADA Communication using DNP3

Presenter:
Peter Jackson
Water and Wastewater Business Development Manager, NSI Neal Systems Inc
Nick Smith
CO Technical Sales Manager, Schneider Electric

Abstract:
The DNP3 protocol has evolved over the last three decades to provide significant advantages for SCADA operations that require communication with remote devices over large distances. We will be highlighting the functionality that has made DNP3 such a powerful tool in telemetry applications across water & wastewater industries, looking specifically at how it can be leveraged to address common communication challenges in the market. Also, discussions around security capabilities, system architectures as well as best practices to help avoid common pitfalls in systems.

Learning Objectives:
Collecting data from remote assets reliably
Advantages of a time/date/quality of data protocol designed for the W/WW vertical
Automatic recovery of remote asset data storage after a communication link downtime.

Biography:
The presenter will be from Schneider Electric. Peter Jackson is the Neal Systems Vendor/Booth contact person.

Nick Smith Denver, CO Technical Sales Manager Schneider Electric
Electrical Engineering and Mathematics BS, University of Wyoming
10 years system integration experience in water and oil & gas industries.
7 years at Schneider Electric, subject matter expert in telemetry hardware.

32. Wednesday, August 30, 2023
Room 215
2:00 PM - 2:30 PM

Title: Make the Data Speak Your Language: Fostering Dialogue Between Plants and Their Supporting Laboratories

Presenter:
Sadikia Caldarazzo
Laboratory Technical Administrator, City of Baltimore

Abstract:
Abstract: The treatment of the water cycle can be complex. Historically, support labs have been in place to serve as a checks and balance to the plants. Labs report the chemical parameters at each stage in the pre-treatment and treatment processes in support of the plants meeting regulatory requirements; while also, reporting the biological status of effluent samples as they relate to E. coli and Enterococcus. The lab personnel are subject matter experts in the chemistry, biology and quality control of data generated. The plants are subject matter experts on the daily operation and maintenance of the treatment process. As learning curves tighten with new technology and communication systems, informational highways need to be utilized between the plants and their supporting labs beyond just data. Labs need to understand the integral part they play in the water treatment cycle as a whole. Plants need to know what the labs do, why they do it, and what other information they are capable of providing. Engaging stakeholders at various levels addressing impediments and discrepancies provides effective solutions. The comprehensive sharing of pertinent information will only lead to increasing awareness and will serve as a catalyst for optimal management of the plant's treatment process, operation and maintenance. Consistent dialogue between plants and their supporting labs will generate necessary resilience of the utility's operations. We will present case studies that show how the collaboration between the lab and plant management solves otherwise trivial events that can happen in operations and maintenance of the system. We will also present how this same collaboration can assist lab personnel with understanding outliers or trend changes in the data.

Learning Objectives:
To articulate the entire water process from drinking water sources to wastewater discharge points.
To understand the lab's role as a scientific support.
To identify pertinent stakeholders pertinent to the process and communicate more effectively.

Biography:
Sadi Caldarazzo is a Laboratory Administrator for the City of Baltimore's Department of Public Works, Laboratory Operations Division. She has 20 years of experience with water and wastewater analysis and management. She holds a B.A. in Biology with a minor in Chemistry, M.B.A with a concentration in Leadership and a Ph.D. candidate in Business Leadership.

33. Wednesday, August 30, 2023
Room 215
3:30 PM - 4:00 PM

Title: If a water pipe leaks in a creek does it make any noise?

Presenter:
Dennis Funk
Project Manager, Gannett Flemming, Inc.

Abstract:
The Stoney Creek Transmission main is a subaqueous water main that crosses Stoney Creek parallel to the Stoney Creek Drawbridge located in Pasadena, Maryland. The transmission main was originally installed in 1969 as a 30-inch prestressed concrete cylinder pipe (PCCP). The original PCCP was repaired in 1996 by slip lining it with a approximately 950' of 24-inch high density polyethylene pipe (HDPE). In July, Anne Arundel County approached Gannett Fleming about reports of the 24-inch pipe leaking on the east side of Stoney Creek. Gannett Fleming worked with the County's on-call emergency response contractor to investigate the source of the leakage. The contractor's investigations revealed that the source of the leak was not in the buried pipe, but was in the subaqueous HDPE pipe somewhere inside the PCCP. The PCCP acting as a casing resulted in the leakage surfacing in the riprap embankment adjacent to the creek. A number of alternatives for addressing the leak were considered including removing and replacing the HDPE pipe, internally repairing the HDPE pipe, sliplining the HDPE pipe with a smaller pipe, lining the HDPE pipe with a potable cured in place liner, and lining the HDPE pipe with a relatively new material, the Primus fabric liner. The presentation will summarize the evaluations and factors considered that lead to the ultimate selection of the Primus liner that may be useful to others evaluating pipe repair options. Additionally the presentation will address the various considerations, both in design and construction, with the use of the Primus material.

Learning Objectives:

Biography:
Mr. Funk is an associate at Gannett Fleming, Inc. and has 30+ years of engineering experience in municipal water and wastewater infrastructure including pipeline design, evaluation and design of treatment systems, pumping stations, performing modeling, system evaluations, master planning. His pipeline experience includes large and small water and wastewater design projects, and a variety of trenchless methods. He has been a member of AWWA for over 25 years and has served as a committee chair and trustee in Chesapeake Section of AWWA.

34. Wednesday, August 30, 2023
Room 215
4:00 PM - 4:30 PM

Title: Overcoming Construction Challenges During COVID on a Complex Multi-phase Project

Presenter:
Will Hinz
Vice President, WRA

Abstract:
In 2016, the Chesterfield County Department of Utilities began planning the construction of a new water pump station and interconnection with the City of Richmond, VA to provide 5 MGD of additional supply to the County. The $20M project, completed in 2022, involved a 5 MGD water pumping station, a 2-million-gallon ground storage tank and approximately 25,000 linear feet of 24" water transmission main. The initial planning and design process involved significant public involvement due to the proposed PS and ground storage tank location within a public park. Specialized design items included the site's geotechnical challenges which required construction of the ground storage tank on variable cut/fill conditions and requirements to limit flow/pressure impacts to the adjacent water system. The pump station, ground storage tank and water main projects were bid separately in late 2020, with scheduled completion dates in May 2022. During construction, there were significant impacts from COVID-related factors, three of which produced a trifecta, simultaneously competing for and impacting the project's critical path. Equipment issues for the required 500 KVA transformer created significant delays in establishing permanent power at the PS. Material and manpower issues contributed to delays for water main interconnections to both municipalities. Ultimately, all three COVID-related issues were concurrently resolved in November 2022. The successful completion of the complex project highlighted the importance of constant communication/coordination between all parties involved, with lessons learned in the need for advance supply chain planning, establishing critical construction sequencing, a strategic workforce plan, and contractual requirements for a multi-phase project.

Learning Objectives:
Lessons learned for project coordination and scheduling
Lessons learned for material aquisition
The importance of trying to build in better contingencies for unforeseen conditions for pipelines

Biography:
Will Hinz is water and wastewater engineer with 25 years of experience, specializing in the design of utilities and pumping stations in the Mid-Atlantic. Mr. Hinz is licensed in MD, DE, VA, and Texas.

35. Wednesday, August 30, 2023
Room 215
4:30 PM - 5:00 PM

Title: Collaborative Design-Build Approach Saves 84-inch Water Main from a Storm Drain Sinkhole

Presenter:
William Wagner
Senior Vice President, Whitman, Requardt and Associates, LLP

Abstract:
The 84-inch Herring Run Water Transmission Main delivers drinking water to a large percentage of the Zone 1 system in eastern Baltimore City and County. A sinkhole formed following the collapse of a portion of the 108-inch Tiffany Run Storm Drain, exposing approximately 20 feet of the 84-inch main, which is located approximately 30 feet above the top of the drain. The unsupported portion of the 84-inch main weighs about 100,000 lbs. Due to the urgency of this situation, the City had to expedite the selection of a contractor and develop a collaborative approach to developing a cost-effective means to repair the drain. This presentation will include method of selecting a contractor, the planned repair before the failure reached the surface and how the approach evolved once the sink hole appeared. Close coordination among agents of the City of Baltimore, WRA and Garney Construction developed emergency actions that maintained the main in-service until a 48-inch temporary bypass could be installed; thereby eliminating the loss of water to the public. The bypass was planned and installed within 4 weeks of the sinkhole appearance. The presentation will then present the steps and measures implemented to repair the 108-inch brick storm drain constructed in 1880 as a mined tunnel more than 40 feet below grade and concluding with restoring the 84-inch main to service. The WRA Garney Team were already working on the fix for the 108-inch storm drain. An inspection of the storm drain following upstream flooding of a residential neighborhood discovered a cavity spanning 70 feet long, 25 feet wide and 15 feet above where the crown of the drain used to be. The 108-inch drain (and cavity) crosses the 84-inch at an acute angle resulting in the potential catastrophic compromise of the water main.

Learning Objectives:
Collaborative alternative delivery yields fast completion / resolution of an emergency situation
How to select a contractor based on qualifications and approach, not low bid.
How to approach a design to stabilize a sink hole from compromising critical utilities.

Biography:
36. Wednesday, August 30, 2023
Room 217
8:30 AM - 9:00 AM

Title: Navigating Pre-Procurement as a Solution to Equipment Backlog on Emergency Projects

Presenter:
Badana Mohamadi
Water/Wastewater EIT, HDR

Abstract:

The Freund House Wastewater Pump Station, owned and operated by Fairfax County, has a rated capacity of 32 MGD. The station has a mechanical bar screen located in the main influent channel. The screen is in a severely deteriorated condition, and failure is anticipated with continued use. It was ultimately determined that a full replacement was necessary. The County placed the screen out of service while working through replacement plans, and flow coming into the station has now been split between the main channel and an adjacent bypass channel with a manual screen to avoid a station overflow. This however has created a burden on maintenance staff, as they now must manually clear out two screens daily to avoid channel backups. With challenges associated with the supply chain due to the pandemic, the County was looking at extended lead times for new screening equipment. Extended equipment lead-times, paired with the design and bidding process pushed the schedule of the repair work too far out, given the urgency of the situation. The County decided to pursue the pre-procurement route for the mechanical bar screen to expedite the delivery of the equipment while the remainder of the installation details and repairs are being worked through. The team had to work through challenges and risks associated with the pre-purchased equipment being in alignment with a feasible installation. With an installation contractor not yet on board, the design team and manufacturer's representative had to ensure flexibilities were incorporated to anticipate a range of construction challenges. A helpful tool in navigating site realities and potential risks was a LiDAR scan of the facility, conducted prior to initiating design. This session will highlight lessons learned and risk mitigation for equipment pre-procurement to address lead time concerns and provide an overview of the engineer-owner-manufacturer coordination during the emergency response for a large pump station screen replacement.

Learning Objectives:

Biography:
Having graduated with a B.S. in Civil Engineering from George Mason University, Badana currently works in consulting engineering on a number of water and wastewater projects around the mid-Atlantic region.

37. Wednesday, August 30, 2023
Room 217
9:00 AM - 9:30 AM

Title: Building Resilience through Operations Technology Cybersecurity: An Anne Arundel County Case Study

Presenter:
Kandace Jennings PMP
Ms., Gannett Fleming

Abstract:
Over the years, the water sector has developed ways to utilize emerging technology for water and wastewater system operations automation. The water and wastewater industry has become greatly dependent on technology, specifically Supervisory Control and Data Acquisition (SCADA) systems. Automated systems and the SCADA systems used to monitor and control these systems have become indispensable tools to operate water and wastewater utilities efficiently. As the technology that makes this efficient operation possible progresses, the threat to these systems also increases. Cyber threats to Operations Technology (OT) have never been more significant, and they continue to increase. Up until now, keeping these networks isolated from the internet and the outside world has been a sufficient means of protecting SCADA systems from cybercriminals. However, times are changing and bad actors are advancing. Technology that can allow a malevolent actor to access the operations technology network has become easily accessible. As a result, these networks are extremely vulnerable to cyber attacks. While most systems can maintain operations for a short time without a SCADA system, long-term operations are not sustainable due to staffing and budget constraints. Assessing the cybersecurity of an OT network and identifying vulnerabilities is the first step toward increasing resilience. Once the vulnerabilities are identified, developing, and implementing mitigations to safeguard the OT network must become a priority for the utility. This presentation will feature Anne Arundel County's effort to become more resilient by conducting a thorough cybersecurity assessment of its OT network, identifying all cyber assets, and developing a plan to fortify its network through the implementation of cybersecurity best practices and additional mitigations. By strengthening the OT network's cybersecurity, the County aims to increase the overall resilience of its water and wastewater systems by decreasing the risk of a successful OT network cyberattack, reinforcing the network monitoring, and decreasing the overall response and recovery time by developing mitigations and response procedures.

Learning Objectives:
Identify cyber threats to Operations Technology and SCADA systems.
Understand the process of identifying vulnerabilities, developing countermeasures, and implementing mitigations.
Learn the value of strengthening the cybersecurity of an Operations Technology network.

Biography:
Kandace Jennings, PMP is a security and risk analyst with Gannett Fleming with seven years of experience in the water and wastewater sector. She specializes in risk assessment and risk management for water and wastewater utilities seeking to build resilience and achieve compliance with government regulations.

38. Wednesday, August 30, 2023
Room 217
9:30 AM - 10:00 AM

Title: Cyber Resilience Starts with a Cybersecurity Program

Presenter:
Cole Dutton None
Cybersecurity Specialist, US Environmental Protection Agency

Abstract:
Session Summary: EPA's Water Infrastructure and Cyber Resilience Division will provide steps utilities can take to begin building strong, resilient cybersecurity programs and decrease the chances of being a victim of a cyber-attack. Complete Abstract: Cyber-attacks are a growing threat to US Critical Infrastructure and the water sector is a prime target. A major cyber-attack on a water or wastewater utility can erode customer confidence, result in financial and legal liabilities, and worst of all, potentially compromise the ability to provide clean and safe water to customers. Often, cyber criminals choose their targets based on their ability to inflict the most damage and/or the highest potential for financial gain. One way these criminals can achieve both outcomes is by launching a ransomware attack, locking down a vulnerable utility's computer systems and only unlocking them if a ransom is paid. The good news is utilities can begin taking steps today to decrease the chances of being a victim of a cyber-attack. Understanding the threats and basic cybersecurity best practices is crucial for water and wastewater utilities to maintain operations and build their cyber resilience. While there are many steps involved in cyber resilience, it is essential that utilities develop and maintain a strong cybersecurity program. A solid cybersecurity program includes implementing cyber hygiene principles, using technical cybersecurity controls, and fostering a strong cybersecurity culture among staff. To assist in developing a cybersecurity program, EPA's Water Infrastructure and Cyber Resilience Division has developed and continues to offer a variety of resources and tools to assist utilities in each step of the Water Resilience Framework which includes assessing, planning, training, responding, and recovery. The resources include a Checklist of Best Practices, a comprehensive Cybersecurity Incident Action Checklist, Cybersecurity Technical Assistance and Evaluation, and a cyber scenario within the Water Resilience Tabletop Exercise (TTX) Tool. These tools, along with additional resources that will be released this year, can help bridge the cyber gap utilities face and can build the foundation for a strong, robust, and resilient cybersecurity program.

Learning Objectives:
Understand the common cybersecurity threats to water and wastewater
Understand the importance of building a cybersecurity program
Understand the resources EPA offers to assist utilities in building cybersecurity programs

Biography:
I'm a Cybersecurity Specialist in EPA's Office of Water, Water Infrastructure and Cyber Resilience Division's Cybersecurity Branch. I hold a Master's Degree in Information Security from James Madison University and two industry standard cybersecurity certifications from CompTIA and (ISC)2.

39. Wednesday, August 30, 2023
Room 217
1:00 PM - 1:30 PM

Title: Introduction to a New Design Standard for Close-Fit Liners: 20 years in the Making

Presenter:
Christopher Garrett
National Practice Leader - Conveyance Infrastructure, Brown and Caldwell

Abstract:
Cured-in-place pipe (CIPP) method has a 50-plus year history as a trusted rehabilitation method for linear assets. Since 1989, ASTM F1216 has been the design standard based on narrowly defined assumptions for a conservative liner thickness calculation as applied to a limited pipe size and geometry spectrum. Even with this conservatism, there have been documented design flaws, especially for larger conduit assets, non-circular assets, and liners with excessive annulus space at the host pipe. With 20 years of collaboration and research, a refined design method was introduced in 2021 for circular and non-circular gravity pipe close-fit lining candidates. Based on Load and Resistance Factor Design (LRFD) limit states, the new design method addresses various sustainability states: groundwater resistance (State I); safe pipe-soil interaction with overloading evident (State II); and unsafe pipe-soil interaction (State III). The design method suggests up to 30% thinner liner thicknesses compared to the F1216 method, coupled with more credible design comfort compared to the existing Allowable Strength Design (ASD) method. The paper includes: • Origins and limitations of the ASTM F1216 design standard • Origin of the MOP 145 standard and comparison to other international design standards • Overview of the LRFD method for close-fit liners and improvements compared to ASTM F1216 • Case study examples of MOP 145 vs F1216 for liner thickness design

Learning Objectives:
Origins and limitations of the ASTM F1216 design standard
Overview of the LRFD method for close-fit liners and improvements compared to ASTM F1216
Demonstration of new design standard advantages with case study examples compared to ASTM F1216

Biography:
Chris Garrett specializes in the assessment, rehabilitation, design and program management of aging infrastructure. As Brown and Caldwell's National Practice Leader for Conveyance Infrastructure, he presently guides the evaluation and introduction of new technologies for condition assessment and rehabilitation and developing standards for new pipe and rehabilitation solutions using trenchless methods. Chris also chairs NASSCO's Technical Advisory Council (TAC) and was an early advocate of the P/L/MACP condition assessment methodology as a certified trainer since 2002. With the TAC, he is instrumental in providing technical leadership for the evaluation and adoption of technologies and standards within the aging infrastructure industry.

40. Wednesday, August 30, 2023
Room 217
1:30 PM - 2:00 PM

Title: The Crypt is Open – Tales from the Brentwood Park Pumping Station Improvements

Presenter:
Mathew Roder P.E.
Principal Project Manager, Arcadis

Abstract:
This presentation is a follow-up to one given in 2019 describing the challenges of designing this project. It describes the challenges of preparing the sequence of construction to account for extended equipment lead times due to COVID in addition to the limited space and access to the site. Construction has begun on this project and will be almost complete prior to the conference. Harford County's Brentwood Park Pumping Station, "The Crypt", is a 1.2 MGD pumping station that includes a dry well installed by a developer 25 feet below the ground surface. It is accessible via a hatch at ground level and a ladder to the dry well and pumps. The pumping station is in a residential area on a steep sloped parcel approximately 0.09 acres in area. It is accessible only by a narrow access road that runs between two houses on a residential street. The Improvements will increase the pumping capacity, improve access to the pumps, and convert the electrical service from 240 V to 480 V. The improvements include installing new suction lift pumps in a new dry well with a floor elevation only 9 feet below grade. A new pre-cast pumping station building will sit on top of the dry well. The improvements also include new electrical equipment and generator. The greatest challenge was to complete the sequence of construction to minimize disturbance while keeping the station operational. The most obvious challenges were the need to demolish the existing discharge force main and existing electrical power and controls to accommodate construction of the new dry well and prefabricated pumping station building. To minimize site space devoted to bypass pumping equipment, the County recommended installing a new force main and using the existing pumps until the new pumps are operational. In parallel, the Contractor will be required to install temporary power and control cables to the existing pumps. The County developed seven milestones to guide the contractor through the construction while maintaining operation of the existing pumps. Finalizing the sequence of construction coincided with the onset of the COVID pandemic and the shutdowns of equipment manufacturers. This forced the County to reach out to manufacturers to get estimates for equipment and material lead times. It also resulted in changing the force main piping from restrained push-on joints to mechanical joint piping with restraining gaskets. This change reduced the lead time for the force main pipe from 12 months to less than 2 months. The conference presentation will include pictures of the various stages of construction including demolition of The Crypt's dry well.

Learning Objectives:
Learn how to maximize operations of existing equipment during construction
Learn how to adapt to supply chain issues
Learn about the construction of the pumping station

Biography:
Matt Roder is a project manager for Arcadis. He has managed pumping station improvements, treatment plant upgrades, sewer replacements, and various other projects for multiple clients in Maryland and Virginia. He holds a Bachelor's degree from the University of Notre Dame and a Master's degree from the Illinois Institute of Technology. He lives in Bowie, MD.

41. Wednesday, August 30, 2023
Room 217
2:00 PM - 2:30 PM

Title: Out of Sight, but Not Out of Mind – Pay Attention to Your Covered Assets

Presenter:
Per Struck
P. E., BCEE, Vice President Whitman, Requardt & Associates, LLP
Michael Nye
Project Manager, Delon Hampton and Associates (DHA)
Rouben Derminassian, DC Water (Non-Speaker/Co-Author)

Abstract:
The Headworks Influent and Effluent Structures Rehabilitation project involves needed repair and restoration of the concrete sewer conduits on the influent and effluent sides of the East and West Headworks within the Blue Plains Advanced Wastewater Treatment Plant (BP AWTP). The Plant's West Side influent conduits were initially built around the 1930s and are now more than 80 years old. The East Side conduits were built later, in the 1960s-1970s and are now approximately 50 years old. Based on the field investigations and condition assessments it was concluded that although the conduit concrete surfaces were found to be heavily corroded from H2S attack throughout repairs are generally limited to surface repair and re-coating. The influent to the Headworks was in jeopardy of a blockage, pump/screen damage or collapse in the future if left untreated. This would have created a safety risk for staff work around the Headworks and greatly impacted wastewater treatment operations and the ability to meet the NPDES discharge permit. The repair method for restoring concrete surfaces and providing long term protection against H2S attack includes hydro-demolition and coating/re-building of the surfaces with a calcium aluminate (CA) cementitious shotcrete product. This product was recently applied to the heavily deteriorated effluent channels on the West Grit side and was first used at BPAWTP around 2011 for rehabilitation of one of the plant's grit influent channels, which was spot checked to be in good condition as of 2022. This presentation will include the main scope items of work for long term prevention against H2S and structural rehabilitation of the headworks structures, as well as some of the challenges faced in the design to maintain plant operations. This project is an example of how critical assets that have been subjected to harsh H2S environment for decades can be upgraded effectively to last long term.

Learning Objectives:
Potential risks of not inspecting and repairing covered corroded concrete.
Become familiar with application process of calcium aluminate (CA) cementitious shotcrete product used for restoring concrete surfaces.
Become familiar with how of calcium aluminate (CA) cementitious shotcrete protects long-term against H2S attack.

Biography:
Per Struck is a vice president at Whitman, Requardt & Associates with over 30 years of experience in planning and design of wastewater treatment facilities. He holds a graduate degree in Civil Engineering from Polytechnical University of Copenhagen, Denmark.

Michael Nye is a project manager at Delon Hampton and Associates (DHA). Since first joining DHA as a structural engineering intern, he has taken part in a wide variety of designs and condition assessments

with a more recent focus on water/wastewater projects. Michael is a licensed professional engineer in the District of Columbia, Maryland and Virginia. Michael's water/wastewater experience includes projects for DC Water, Washington Aqueduct, WSSC, City of Baltimore and City of Richmond. As part of DC Water's Wastewater Treatment Program Management team, Michael managed the planning and design phases of this CIP project.

42. Wednesday, August 30, 2023
Room 217
3:30 PM - 4:00 PM

Title: Proposed Electrical Tower Near a Force Main in the Bush River.... Let's Perform an Underwater Inspection to Assess Risks!

Presenter:
James Shelton
National Technical Director, Arcadis

Abstract:
Harford County owns and operates a 24-in diameter force main from the 15 MGD Bill Bass Sewage Pumping Station, which spans the Bush River near electrical towers supporting overhead 115 kV power lines owned by Baltimore Gas & Electric (BGE). BGE decided to replace their old electrical towers by means of pile driving in the river and on the shores, which posed risk to County's 50 years old force main, approximately 40 ft away from the proposed in-River tower. The spiral welded steel force main is located 4 to 6 ft under the riverbed and is supported with wooden pile bents and joined with dresser coupling at some locations. The in-River portion of the force main had not been visually inspected since its original installation and the County was concerned about the current condition of the force main, pile bents and bolts, and dresser couplings near both the new tower construction and old tower to be demolished. The vibrations resulting from the pile driving for the new tower foundation could present excessive risk due to settlement of pipe, down drag of the pile, and soil liquefaction possibly leading to rupture of the force main. Background data including the force main as-built drawings, specifications, original construction photos and reports, a free-swimming acoustic ball inspection report, and a vibration study from the electric utility were reviewed. A desktop evaluation was performed for the County to assess the condition of the existing force main. Recommendations were made to include the following: field survey along 200 feet of the force main including the piping, pile bents, a dresser coupling near the proposed in-River tower, visual inspection and documentation, allowable maximum vibration limit, use of an alternate construction method to reduce vibrations, a monitoring plan for vibrations and pipe settlement during construction, and a River scouring analysis. Then a visual inspection of underwater pipe, pile bents, and a dresser coupling was performed by using divers and underwater equipment. The force main was found by a combination of probing and vacuum excavation of the river bottom conducted from a barge platform that contained crane, suction pumps, compressors, and conex office. Excavation in the river was performed using hydro blast and airlift methods in doghouse style shoring boxes for the safety of divers. A pile bent and a dresser coupling were exposed for a class 1 visual inspection. The pipe, pile bent, and dresser coupling with bolts were observed to be in good condition with no visible corrosion or damage. A maximum vibration limit of 0.6 in/sec peak particle velocity was recommended near the force main during the new tower construction. Pre and post construction surveys were recommended to confirm adequate pipe cover. BGE reviewed the technical recommendations made and decided to revise their work. BGE increased in-River separation to 200 feet from the existing force main, change the pile driving method from hammer to caisson drilling, monitored vibrations to a low level, and revised tower demolition all to minimize construction risks to the existing force main.

Learning Objectives:
Understand the process and criteria for underwater piping inspection
Understand the potential risks on old pipelines from proposed construction in the river

Understand the condition assessment parameters and construction methods for risk reduction on the old pipelines

Biography:

Jim Shelton is a Vice President and National Technical Director for Buried Infrastructure for ARCADIS, focusing on condition assessment, rehabilitation, construction management, capacity assurance, operational assistance, and program development and management. He specializes in large program development and in the delivery of turnkey pipeline rehabilitation projects using Construction Manager at Risk and Collaborative Design-Build. He has a degree in Chemical Engineering from University of Pennsylvania, is a licensed water and sewer contractor in several states, and holds active Professional Engineering licenses in Civil Engineering in 14 states.

43. Wednesday, August 30, 2023
Room 217
4:00 PM - 4:30 PM

Title: External Verification of Internally Identified Defects During a Forcemain Condition Assessment

Presenter:
Emer Flounders P.E.
Business Development Manager, PureHM U.S. Inc., a Xylem brand

Abstract:
In 2020, a western Canadian regional water authority decided to perform a condition assessment of a section of sewer forcemain that ran through an environmentally sensitive and protected park area. The forcemain is relatively short, measuring only 350-metres and made of 533mm internal diameter, 4.8mm thick wall continuous welded steel pipe with a coal tar enamel coating. The span is cathodically protected with an impressed current system. The water authority selected Pure Technologies to execute a high-resolution condition assessment to quantify the risk of further failures and determine whether rehabilitation would be required. The inspection was conducted using high-resolution free-swimming inspection technology, PipeDiver®, an Electromagnetic Inspection (EM) tool designed to identify and locate areas of corrosion and wall loss along the length of the steel pipeline. After the completion of the internal inspection, it was decided to perform an aboveground external condition assessment using PureHM Spectrum XLI technology. Analysts correlated internal and external data sets and were able to verify one defect and one coating anomaly during direct examination and repair. Successful verification of defects using external inspection techniques now provides a quicker and less expensive process to sort and identify pipe sections that may require more detailed post-inspection investigation.

Learning Objectives:
Techniques for internal and external condition assessment of forcemain
Accurate correlation of internal and external inspection data sets
Lower cost external inspection technique to priority sort and identify sections that may require more detailed investigation

Biography:
Emer Flounders, a Materials Engineer from Drexel University in Philadelphia, PA and a registered Professional Engineer in 8 states, is currently the PureHM US Business Development Manager. He has over 40 years of corrosion control experience to private industry and government agencies. He has worked in the follow industries: water and wastewater, gas and oil, and electric power. Investigations have included: failure or root cause analysis, materials selection, cathodic protection (CP), stray traction current, atmospheric corrosion, coatings, water treatment, design, corrosion studies, reinforced and prestressed concrete, and storage tanks.

44. Wednesday, August 30, 2023
Room 217
4:30 PM - 5:00 PM

Title: To Dig or Not to Dig? A Case Study in Sewage Force Main Replacement by Pipe Bursting/Splitting

Presenter:
Thomas Crawley P.E.
Project Manager, Wallace Montgomery & Associates, LLP

Abstract:
Located along Opel Road and Stone Haven Drive in Glen Burnie, Anne Arundel County, the Stone Haven Sewage Pumping Station Force Main is an approximately 3,500-foot-long pipeline that connects the Stone Haven Sewage Pumping station to the 16" PCCP Freetown Force Main in Solley Road. Originally constructed in the early 1980's from 6-inch ductile iron pipe (DIP), the County had experienced several leaks and breaks in the existing 6" ductile iron pipe (DIP) force main at various locations that were found to be caused by severe corrosion of the pipeline, indicating that replacement of the entire pipeline was required. The County was also planning improvements to the Stone Haven SPS that would increase pumping rates to meet projected 2035 demands, which would place further stress on the aging pipeline. Opel Road and Stone Haven Drive are narrow asphalt roadways with a paved width of ±22 feet in a 30-foot wide right of way. In addition to the existing 6" DIP force main that lies near the center of the road, an existing 8" gravity sanitary sewer, an 8" DIP water main, and various buried electric and telecom lines lie within the road and right of way. Stone Haven Drive is the sole source of access to over 60 homes; road closures for conventional open-cut replacement at/near the road centerline were not feasible and would greatly impact residents and impair access by emergency services during construction. Wallace Montgomery was retained to investigate options for force main replacement that would reduce impact to residents and decrease construction duration, including alternate alignments and potential trenchless installation methods by horizontal directional drilling (HDD) and pipe bursting/splitting, and to prepare contract documents for bidding and construction. This presentation will discuss the design approach/strategies that Wallace Montgomery implemented to identify the optimal alignment and installation methodology for the replacement force main. Below are steps taken during the design phase: 1. Performed topographic survey and ASCE QL-B utility locating along the road corridor for the full width of the right-of-way. 2. Performed a field walk to observe site conditions and identify additional constraints and environmental concerns (e.g., large trees, wetlands). 3. Evaluated replacement options including same-trench replacement by traditional open-cut methods, trenchless installation by HDD along a parallel alignment, and same-trench replacement via trenchless pipe bursting/splitting. Researched pipe bursting/splitting methods, equipment, limitations/constraints and benefits. 4. Identified pipe bursting/splitting as the optimal replacement method to minimize road closures and construction duration to provide the least impact possible to residents. 5. Prepared contract documents for replacement of the existing 6" DIP with new 8" HDPE DR-11 via pipe bursting/splitting, including special provisions and performance specifications for pipe bursting/splitting. 6. Worked with County personnel to pilot the pipe bursting/splitting technology on the first pressure pipe implementation in Anne Arundel County. 7. Worked with County PM on public outreach and schedule coordination. Construction was completed in 2022 with no road closures, minimal excavation, and reduced construction duration. Mission Accomplished!!

Learning Objectives:

Biography:

Tom Crawley, a 2003 graduate of Bucknell University with a B.S. in Civil Engineering, is a Project Manager in the Water & Wastewater Department at Wallace Montgomery & Associates. Tom is a licensed Professional Engineer in the states of Maryland and Pennsylvania and has over 19 years of experience, with the last 7 years focusing primarily on water distribution and wastewater collection and conveyance rehabilitation and replacement projects.

45. Thursday, August 31, 2023
Room 201-202
8:30 AM - 9:00 AM

Title: Assessment of a Glass-Lined Digested Sludge Forcemain

Presenter:
Ad Shatat P.Eng.
CEO, PICA Corp

Abstract:
This paper describes a unique project, where an internally glass lined Ductile Iron force main was assessed using an internal electromagnetic inspection tool. The force main in question was installed in 1973 and is operated by Nashville Metro Water Services (MWS). The 8-inch main transports digested sludge and was factory fitted with an internal glass liner (per ASTM D7091). Over the course of its 50-year operation, the ductile iron main had experienced a number of breaks. The breaks occurred over multiple years, and appeared geographically distributed in different section of the pipelines. While it was possible that the entire main is in poor shape (in which case the breaks represent the ”tip of the iceberg”), engineers at MWS wanted to confirm that the break behaviour was not due to local conditions (and thus avoiding unnecessarily replacing the entire line). To introduce the inspection tool, MWS took advantage of existing valve chambers as convenient locations to launch the inspection tool and also extract the tool. To launch the equipment MWS engineers devised a setup using off-the-shelf PVC components. The engineering group also made a custom retrieve setup which employed a metal “diverter” to catch the tool while allowing waste water to pass through. The inspection identified over 120 indications, with 8 of those sizing deeper than 80% (this includes 3 indications with 0% remaining wall). The data confirmed the engineers’ suspicion that the main was not severely corroded for its full length. Instead the corrosion appeared to flare up in localized areas, allowing MWS engineers to focus their attention to those areas only. Using the inspection results, MWS is devising an approach that combines surgical replacement/repair clamps with anodes. This paper describes, the inspection approach, actual data obtained from the tool, and the resulting post-inspection rehab decisions.
Authors: James Hawthorne, PICA Corp. Aron Thomas, Nashville MWS Ad Shatat, PICA Corp. John Barnett, Nashville MWS

Learning Objectives:
Assessment of ductile iron sludge forcemains.
Explaining assessment data.
Using assessment data to make rehab decisions

Biography:
Ad Shatat holds a Master’s Degree in Engineering Physics from Queen’s University in Kingston, Ontario and specializes in low frequency EM inspection techniques. He has 25 years of experience in Electromagnetic inspections.
Ad is currently CEO at PICA . He loves solving problems and sharing his experience inspecting tubes and pipes as small as 0.75-inch and as large as 78-inch (and almost everything in between).

46. Thursday, August 31, 2023
Room 201-202
9:00 AM - 9:30 AM

Title: Let's Get it Done! Leveraging Big Data to Enhance a Water Main Replacement Program

Presenter:
Michael Marsjanik
Associate Vice President, Hazen and Sawyer

Abstract:
The City of Baltimore Department of Public Works provides drinking water to more than 1.8 million consumers in the Baltimore metro region. With its water transmission and distribution systems consisting of about 4,500 miles (around 1,500 miles within City limits) and an average pipe age of over 80 years, the City has taken steps to upgrade its water transmission and distribution system by proactive replacements utilizing asset management principles. Several years ago, the City developed a proactive water main replacement (WMR) program, with the goal of meeting 15 miles of replacement every Fiscal Year. Over the years, as the program has matured, the City has utilized multiple data sources to track replacement progress and other key metrics. One of the challenges was to centralize these various data sources and develop a dynamic, near real-time data system using dashboards, resulting in staff time savings and more efficient planning and management. This paper discusses various initiatives and steps taken by the management team to successfully develop dynamic reporting and data analysis tools in Microsoft Power BI. The tools cover various aspects of the program including planning, design and construction through data connections with various applications. The PowerBI tool also provides a management dashboard covering program progress, project-level data analysis and reporting, construction progress, schedule, bid items analysis, inspector daily reports, cost indices and CIP cost projections. This presentation provides details about the development of the tool as well as its implementation and daily use on the WMR program. Various functionalities and reports of the Power BI tool will be discussed in detail. The attendees will benefit from this presentation through understanding of the tool's inner workings, development cycle, custom reporting, daily usage and effective program management.

Learning Objectives:
Understanding the multiple data sources associated with a large-scale water main replacement CIP program
Describe methodologies for automatically acquiring data from multiple data sources
Identify Power BI dashboard data model and display layer techniques

Biography:
Michael Marsjanik, PE, Associate Vice President serves as Operations Manager for the Hazen and Sawyer Baltimore office and serves as Program Manager for the City of Baltimore Water Main Replacement Program

47. Thursday, August 31, 2023
Room 201-202
9:30 AM - 10:00 AM

Title: Using Artificial Intelligence to Optimize Sewer Cleaning

Presenter:
Sara Titus PE, PMP
Engineering Research Specialist, WSSC

Abstract:
WSSC Water has 5,700 miles of sewer pipeline. Due to foreign debris such as fats, oils and grease, root intrusion, silt/sediment, and debris, pipelines need to be cleaned periodically to remove blockages and to avoid Sanitary Sewer Overflows (SSOs). Cleaning a sewer pipeline requires a scouring process which over time can degrade wall thickness and reduce pipe life. WSSC Water currently has preventative maintenance (PM) schedules for much of the sewer system, but there are areas that do not receive regular cleaning due to accessibility issues. WSSC Water would like to optimize sewer PM schedules to save money and extend the life of the sewer pipelines. WSSC Water tested 2 technologies that use Artificial Intelligence (AI) to recommend when cleaning is needed even before sewer levels reach an alarm state. This small-scale year-long pilot yielded significant savings of time and money and resulted in zero SSOs at the test sites.

Learning Objectives:
Learn WSSC Water's typical sewer pipeline cleaning schedules and the long-term impact on the health of the system.
Learn the plan for and results of pilot testing two competing technologies
Learn the projected savings for a larger-scale implementation

Biography:
Sara Titus is the Engineering Research Specialist and part of the Office of Innovation and Research at WSSC Water. Sara focuses on testing innovative tools and processes that apply to the horizontal buried assets in the water and wastewater piping networks.

48. Thursday, August 31, 2023
Room 201-202
11:00 AM - 11:30 AM

Title: PCCP Management Innovation Continues: 2022 Field Trial Findings

Presenter:
Kate Zhao
Global Product Manager, Xylem

Abstract:
Prestressed concrete cylinder pipe (PCCP) consists of a thick concrete core, a thin steel cylinder, high tensile prestressing wires and mortar coating. Thanks to its unique design, PCCP has the lowest break rate and is often used in large diameter transmission lines. When it does fail, it can fail catastrophically and cause significant social, environmental, and economical consequences. A comprehensive PCCP management program includes regular inspection of the pipe condition and/or monitoring, along with preventative maintenance and targeted repair/replacement. A typical PCCP monitoring solution uses acoustic fiber optic sensors embedded within pipelines to monitor the condition of prestressing wires by listening to the unique sound of wire breakage. Despite this technology's advantages in high sensitivity, long-distance monitoring and low maintenance, the current fiber optic monitoring is limited to wire break detection only and requires a complex installation process. This paper will discuss two new technologies in development to address the limitations and the field trial findings. 1. Acoustic fiber optic leak detection This solution utilizes the same fiber optic as traditionally wire break monitoring system, but a different data processing method. To validate the design, field trials were conducted both on aboveground steel pipeline and in-situ live PCCP pipeline. During the experiment, simulated leaks of different sizes were introduced at various locations along the pipelines. The results confirmed the feasibility of leak detection using acoustic fiber. 2. Distributed wire break monitoring This solution does not use any fiber optic. It relies on a small sensing system that consists a system controller and one of two types of sensors: external sensor mounted on the surface of pipe, or hydrophone inserted into the water column. To validate the accuracy of the solution, multiple sensors were installed on pipelines with fiber optic monitoring system to compare the results for one year. The results confirmed a high confidence of the system's wire break detection capability and the spacing is a key factor to consider for this type of solution.

Learning Objectives:
Current prestressed concrete cylinder pipe management strategy
Innovation in pipeline leak detection
Innovation in pipeline wire break detection

Biography:
Kate Zhao is a global product manager at Xylem with focuses on digital solutions for pipeline management. She graduated from Johns Hopkins University with a master's degree in environmental engineering and is a registered Professional Engineer in Maryland.

49. Thursday, August 31, 2023
Room 201-202
11:30 AM - 12:00 PM

Title: Seeing is Believing: lessons learned from exposing cathodically protected piping

Presenter:
Andrew Fuller
Corrosion Practice Technical Lead, Black & Veatch

Abstract:
Utility managers throughout the region are seeking to improve resiliency while dealing with the costs of aging infrastructure. Cathodic protection (CP) has been adopted to extend the life of many critical pipelines allowing reliable redundancy. The external corrosion direct assessment (ECDA) practice allowed by CP also plays a critical role in the condition assessment of those pipelines.Einstein said 'in theory, theory and practice are the same. In practice, they are not.' Thermodynamics tells us that effective cathodic protection will theoretically prevent corrosion indefinitely. While water system planners would love to count on having immortal piping, is this just a pipe dream? Validation digs are an important part of any cathodic protection program to show that the system is effective. Among the principal questions is whether the environment, coating, or construction has introduced defects preventing its efficacy. This presentation reviews the results of in-depth visual inspection and NDT on thousands of feet of cathodically protected piping. How does cathodic protection theory compare to practice over the course of a pipe's life? How are other threats to remaining useful life considered? Particular attention is given to the identification of coating and other defects on a cathodically protected pipeline. The ECDA practice will be highlighted with case studies showing how it can be a low-cost technique to support condition assessment of pipelines.

Learning Objectives:
What is the external corrosion direct assessment (ECDA) process is and how does cathodic protection allow a surveyor to locate issues with a buried pipes coating?
What is the legal definition and significance of time-dependent threats on buried pipelines?
How do microbiological influences, electrical shielding, and calcareous deposits relate to the ability of cathodically protected assets to resist corrosion indefinitely?

Biography:
Andrew is a registered PE and certified Cathodic Protection Specialist with Black & Veatch. As the corrosion practice technical lead he focuses on producing high quality corrosion evaluation and mitigation products. His team’s primary responsibilities are: cathodic protection, protective coatings and linings, corrosion modeling, integrity testing, root cause analysis, and rehabilitation.

50. Thursday, August 31, 2023
Room 201-202
12:00 PM - 12:30 PM

Title: Peering Through the Subsurface to Assess Vulnerability in Gravity Sewer Pipes: Why do you look so Sag?

Presenter:
Ziwei He
Water/Wastewater Engineer, HDR

Abstract:
Fairfax County (VA) is performing a vulnerability assessment for seven miles of sanitary sewers serving the Belle View neighborhood. A high percentage of pipe segments in the project area contain sags and several cave-ins have happened during the past 50 years. The County seeks to evaluate the impacts of challenging soil conditions on the sewers and to develop an asset renewal strategy. The project team conducted a Ground Penetrating Radar (GPR) survey over the sewer alignments, as well as three soil borings. The GPR survey identified various potentially anomalous conditions including possible subsurface voids. Review of soil borings and piezometer data revealed the project area is comprised of weak, alluvial soils with a high, fluctuating groundwater table. The result is “running sands” that are prone to settlement and can lose bearing strength after disruption from construction operations. The team also reviewed recent CCTV inspections for sag locations, compiled other buried utility record information for possible correlations, and reviewed the County’s operations and maintenance (O&M) database to quantify the consequence of sags. The GPR data was compared to observed sag locations to look for correlations between sagging pipes and subsurface voids, considering that voids could be a predicter of pipes at risk for sagging. Results of the field investigation are used to develop an adaptive management approach to short and long term asset renewal. Pipes were ranked in priority based on the perceived risks, including detected voids, O&M history, sag severity, and customer impact. The multi-faceted approach includes settlement monitoring, a jet grouting pipe stabilization pilot project, and replacement for severely sagging pipes. Settlement monitoring is recommended for both stabilized and non-stabilized pipes to assess efficacy of the pilot project. These strategies will lay the foundation for a financially sustainable capital improvement program.

Learning Objectives:
Sagging sewer assessment with Ground Penetrating Radar (GPR) and soil borings visualizes the potential soil voids and anomalies.
Comprehensive CCTV, subsurface survey results, and O&M history review informs a risk based prioritization of pipe rehabilitation program.
Long-term monitoring solutions include jet grouting pilot program, settlement monitoring, additional piezometer installation, and periodic CCTV inspections.

Biography:
Ziwei provides support for design and cost estimation for wastewater pump station projects and water transmission main projects in Maryland and Virginia. Ziwei performs geospatial data analysis for various projects such as stormwater program management and septic-to-sewer connection strategic planning. She also enjoys performing field condition assessments of sewer mains and pump stations.

51. Thursday, August 31, 2023
Room 201-202
2:00 PM - 2:30 PM

Title: WSSC Water Efforts to Address Pipe Supply Chain Issues

Presenter:
Rosanna La Plante
Division Manager, WSSC Water

Abstract:
Flooding in Texas, the pandemic, and the war in Ukraine created supply chain issues with different pipe materials. With PVC then DIP being affected the most. As is well known, the region was experiencing a greater than one-year delivery time on some products, and the list of unavailable products was changing rapidly. In an effort to address these issues, WSSC Water evaluated the existing policy and material requirements to identify alternative products that the utility would find acceptable. Products evaluated included different classes and coating for ductile iron pipe, PVC pipes with different classes, and HDPE pipe as well as associated connections and fittings. During the evaluation process for alternative materials, WSSC Water assessed the lead time of different materials, anticipated change in life expectance, constraints for the products, and other factors. In the end, Engineering and Construction issued a memo allowing some temporary changes on a case-by-case basis that permitted some flexibility while the supply chain issues continue to be an issue. Some products were also evaluated with consideration of long-term use and implementation within the specifications and pipeline design manual. The presentation will outline the thought process for picking alternative materials, plans for the future, and lessons learned from the process.

Learning Objectives:

Biography:
Rosanna La Plante is a Division Manager for WSSC Water's Engineering and Environmental Services Division in Laurel, MD. She has experience in Civil and Environmental Engineering, working for municipalities and both large and small engineering companies before starting employment in the public sector with the City of Baltimore. Rosanna is active in a number of engineering organizations including CSAWWA, ASCE-Maryland Section, and EWRI. She has received multiple awards for her work with professional organizations.

52. Thursday, August 31, 2023
Room 201-202
2:30 PM - 3:00 PM

Title: Equitable Cost Allocation - DC Water's Multijurisdictional Approach

Presenter:
Eyasu Yilma
Manager, Potomac Interceptor Operations, DC Water

Abstract:
This presentation will describe DC Water’s approach to managing capital and O&M cost sharing with our regional partners. The presentation will describe the cost allocation tool, recent updates to the sewershed characterization and wastewater flow estimates for use in the current cost allocation process, and process tools to support the cost allocation. The Blue Plains Intermunicipal Agreement (IMA) was executed in September 1985 among the District, Fairfax County, VA, Montgomery and Prince George’s Counties, MD, and the Washington Suburban Sanitary Commission (WSSC Water). Most recently updated in 2012, the IMA governs the shared conveyance and treatment of wastewater among the Blue Plains users. The IMA addresses the following key items: - Allocation of the 370 mgd current BPAWTP annual average rated treatment plant capacity among the various users and jurisdictions. - Allocation of capital and operation and maintenance costs among the users of the wastewater conveyance, treatment, and solids management facilities. The allocation of capital cost share depends on the modelled peak flow while the operation, and maintenance cost share depends on calculations through a combination of flow metering and flow estimation. DC Water tracks wastewater flows against the IMA allocations through flow measured at the Blue Plains Advanced Wastewater Treatment Plant (BPAWTP), at DC Water pumping stations, and at the users’ individual points of connection (POCs). Rolling 12-month average flows are compared to the IMA allocations monthly. To provide important estimates of DC Water’s flow contributions in the cost allocation process, District flows are estimated using a combination of measured flows and flow estimates based on demographic data. Developed originally in 2005, Technical Memorandum 18 District of Columbia Wastewater Quantity Assessment (TM18): - Provided estimates of the District’s annual average wastewater flow, the amount of captured combined sewage and identify how these flows vary with rainfall. - Identified any changes in District flows based on changes in population, employment and households projected through the year 2045. - Identified the component sources of the District’s flow (e.g., sanitary wastewater, inflow, infiltration, etc.). - Estimated to what extent the District’s flows have the potential to be reduced and the cost associated with such reduction. This information was recently updated in 2022 as part of a review and update of the overall Multijurisdictional Use Facility (MJUF) cost allocation process. The agreed MJUF O&M procedure requires DC Water to update DC Sewershed flow estimate every five years. The MJUF O&M Cost Share Allocation depends on flow length weighted percentage share for each user jurisdiction calculated as length of estimated user flow conveyed in a defined flow route and the flow amount. The DC Sewershed flow update will impact the cost share estimate.

Learning Objectives:
Understand regional drivers for wastewater treatment and conveyance cost
Describe approach for allocating conveyance costs to multijurisdictional users
Understand data needs and approaches for equitably allocating costs

Biography:

Eyasu Yilma has over 20 years experience providing engineering and planning for water and wastewater systems both in the United States and internationally. He currently is the Manager, Potomac Interceptor Operations for DC Water.

53. Thursday, August 31, 2023
Room 201-202
3:00 PM - 3:30 PM

Title: Interactive and Dynamic Online Asset Management Plans for Utilities

Presenter:
Len Sekuler
Vice President, Arcadis

Abstract:
One measure that utilities are taking to improve operations and maintenance and shore up resilience and affordability is the development of Asset Management Plans (AMPs), which shift decision-making from reactive to proactive. ASCE recommends that utilities implement asset management programs, tools, and techniques to evaluate asset condition and risk, and to prioritize capital and O&M decisions; and states provide funding, training, and technical assistance for asset management programs. Many states require utilities have asset management plans to be eligible to receive State Revolving Funds (SRF) to help fund their infrastructure projects. An AMP should be documented clearly and concisely so that it can be easily understood by all stakeholders. However, utilities often have lengthy pdf documents that do not best support the organization. They are often difficult to read for multiple audiences, such as Executive, Operational, and Implementation levels. In this project, a dynamic and interactive AMP was developed which re-imagines AMPs in a way that better supports the organization for decision-making. The approach included utilizing tools such as Microsoft SharePoint, Microsoft Power BI, and Microsoft Power Automate to transform them into a digital, collaborative, online AMP experience. Some features of the digital, online AMP include: • Easy to use, interactive • Dynamic data visualization to provide insights and support decision-making • Drill-down and filter capability • Online AMP review and approval • Living collaboration hub for past and present AMP work • Easily managed and updated by in-house utility staff • Flexible to fit utility needs Data from various data sources are leveraged and integrated with PowerBI to create dashboards and maps showcasing the asset inventory, consequence of failure, risk and other data. Data sources can be easily updated to generate subsequent year AMPs. A content review workflow is utilized to review and approve content changes and automate email notifications. Web page site security is used to provide different user groups with different access permissions to online AMPs and dashboards. In this presentation, audience participants will learn about and see an example of a digital online Asset Management Plan that is easy to use, interactive, and provides data visualizations to better support decision-making.

Learning Objectives:
Learn about a digital online Asset Management Plan

Biography:
Len Sekuler is a professional engineer and Vice President at Arcadis with 25 years experience. He delivers asset management and information management solutions to water and wastewater utilities. He obtained his Bachelor of Science Degree in Civil & Environmental Engineering from Cornell University, and his Master of Science Degree in Environmental Engineering from Tufts University. He is also certified by the Institute of Asset Management.

54. Thursday, August 31, 2023
Room 201-202
4:00 PM - 4:30 PM

Title: Virtual Reality and 3D Design are the New Norm for Design and Operations Management

Presenter:
Daniel Jeon P.E., PMP, ENV SP
Senior Project Manager, Gannett Fleming, Inc.

Abstract:
The waves of technological advances through the Fourth Industrial Revolution enable water industries to use digital technologies into engineering practices. More than ever, digital technologies play important role in improving collaboration and efficiency of engineering. Howard County DPW needed to capture the as-build conditions of the Little Patuxent Water Reclamation Plant (LPWRP) as LPWRP has been through 7 additions to the plant. 3D laser scanning was performed at the pipe gallery and 3D Building information modeling (BIM) files were developed. Since the County doesn't have 3D BIM software licensing, Cintoo, a digital engineering platform was used for this project. The benefit of Cintoo is that it converts structured point-cloud BIM data into a surface mesh which become compressed data at a ratio of 20 to 30 times, making it much faster to transfer, and less cumbersome to store. Also, Cintoo includes measuring and marking tools in 3D model space which can be utilized for collaboration between operators and design consultants in virtual space. Virtual reality (VR) function in Cintoo was used for virtual assessment and training of the proposed system. For example, an operator can see through VR device to remove and install a pump in 3D model space and identify structural or sequencing preferences. ArcGIS platform was developed from the geodata converted from 3D BID design files. Attributes of maintenance records, O&M manual, submittal file, spare parts, and link to the manufacturer's website could be stored in this this platform. ArcGIS app can be installed in a tablet or a smartphone which can assist an operator in locating equipment or other features and provide a guide for maintenance and operation. Furthermore, ArcGIS platform can be utilized for smart asset management through a digital twin which is a virtual model designed to accurately reflect horizontal or vertical assets. Another benefit of digital engineering is to open doors to a new generation of engineers and operators. Due to the pandemic and recent economic uncertainties, local water utilities and engineering firms are experiencing a challenge in hiring and a vicious cycle of employee turnover. To make matters worse, significant numbers of experienced workforces are retiring or planning to retire. Based on the recent surveys of high school or college graduates, more than 90% say that technology would influent job choice among similar employment offers, and they often aspire to work with cutting-edge technology. Virtual reality and 3D design are no longer science fiction and become the new norm for us to design and operations management!

Learning Objectives:
Demonstration of digital engineering tools such as 3D laser scanning, BIM 360, Cintoo and ArcGIS
Utilization of digital engineering tools for design and construction management collaborations.
Application of digital engineering tools into smart asset management

Biography:
Daniel Jeon, PE, PMP, ENV SP is a senior project manager with Gannett Fleming. He has managed design and design/ build projects including collection system, pumping stations and wastewater and water

treatments for 20 years. He received his bachelor's degree in Civil and Environmental from Utah State University and master's degree from Cornell University.

55. Thursday, August 31, 2023
Room 201-202
4:30 PM - 5:00 PM

Title: Water System Planning in Developed Municipalities

Presenter:
Allyson Merola P.E.
Associate, Whitman, Requardt & Associates, LLP

Abstract:
The City of Dover's (The City) water distribution system was modeled and a master plan was created to project the water system improvements necessary for excellent continued service to the City's customers. Existing water supply, storage, distribution, and control systems were analyzed as well as historical water demands and water meter data, and recent fire hydrant flow tests. A water model was built and calibrated using this information, and water demands were projected to the year 2040 based on historical trends and planned developments and property acquisitions. Projected water demands were compared to available water supply, and future water supply considerations were provided for when demand overtakes current available supply. Water quality analysis was completed, analyzing the effects of water age and pipe age/material on water quality throughout the water system and comparing these results to historic water quality complaints. Overall, the provided data was combined and processed to build an accurate model of The City's water system. The model was used as a tool to address existing system shortcomings and plan for future system development

Learning Objectives:
Hydraulic Water Modelling
Water Quality Assessment
Capital Improvement Planning

Biography:
Allyson Merola is an environmental engineer with a focus in water/wastewater with 15 years of experience in utility design, hydraulic modelling, planning and analysis, and project management. Jeffery Lorencen is an environmental engineer who graduated from Michigan State University in 2019, began his career in wastewater construction and commissioning, and has transitioned into water/wastewater design and modeling.

56. Thursday, August 31, 2023
Room 201-202
5:00 PM - 5:30 PM

Title: Let's optimize your business workflows as part of your Asset Management strategy

Presenter:
Katterinne Fleming
Asset Management Principal, Kennedy Jenks

Abstract:
Many organizations are realizing more and more that Asset Management (AM) is about collaborating across disciplines to make the best decisions using all the information and insights available. This is often much of a cultural challenge as a technical one. So, when it comes to implementing an Enterprise Asset Management (EAM) system, it's important to focus on some fundamental element – well defined business workflows that is very much aligned with a cultural challenge when optimizing business workflows. AM as defined in the ISO 55000, it's a coordinated activity of an organization to realize value from its assets. So, based on this IAM approach of the big picture, a key component of any EAM would include documenting true current state processes to improve and optimize the future state processes; but what happens when an agency disregards the importance of well-defined and documented business workflows? Or better yet, doesn't believe in the change management aspect of things. Have you ever wondered why isn't your system as effective as you thought it would be after switching your EAM? or why is your system taking so long to be implemented? Are you worried because you know you are about to lose your institutional knowledge and haven't implemented any change management strategies? Or simply don't know how to begin to enable the knowledge transfer to the younger staff? Well, you are not alone, many agencies throughout the nation are at that point where a new EAM needs to be implemented or its existing system is simply not meeting the needs and therefore replacement must be carried out. Luckily there are more and more AM practitioners that bring the big picture into helping clients with holistic solutions that enable institutional knowledge transfer. However, at the end of the day, the question still must be addressed, was knowledge transfer factored in? Key outcomes from documenting the right amount of business processes from the right group of stakeholders the right way will not only include transparency by documenting the desired state, but it would also reflect the desired efficiency needed to fully meet all goals within an agency such as cost savings and risk reduction. There is a systematic methodology to documenting business workflows that all experts must follow, you first need to map or develop the As-Is state so that you are able to recommend and map the To-Be state. Another approach to develop or even audit business processes is following the DMAIC (Define, Measure, Analyze, Improve, Control) approach that allows end-users to participate from an improvement cycle which is aligned with the overall asset lifecycle. But as we know well-defined, documented, and optimized business processes are successful when knowledge transfer has been factored in. Enabling open communication and teamwork such that any agency is able to sustainably further develop and maintain their business processes is what makes any well-defined business processes development a successful Asset Management story.

Learning Objectives:
BPM approach and techniques to improve a utility's culture and efficiency
BPM as core to any successful AM story
Business Process diagrams as mentoring tools

Biography:

Ms. Fleming, currently a Principal Asset Management Consultant for Kennedy Jenks, specializes in guiding municipal agencies of all sizes with asset management needs. She has assisted clients nationally and internationally. Katty enables asset management knowledge transfer through well-developed presentation skills. With her talented relationship skills, she is able to establish credibility and garner trust from diverse populations and staff at all levels when it comes to get quick buy-ins. She has served as the Chair of the Southern California Institute of Asset Management Branch fostering asset management knowledge using best practices and industry standards. Her passionate and driven personality have allowed her to serve and give back to her community using her Asset Management skills. She is currently a new member of the IAM USA Chapter Committee serving as the Director for DEI and NexGen.

57. Thursday, August 31, 2023
Room 203-204
8:30 AM - 9:00 AM

Title: Using gas upgrading and thermal hydrolysis to optimize energy production. Case-study from the UK

Presenter:
William Barber
Technical Director, Cambi, Inc

Abstract:
Severn Trent's Minworth wastewater treatment works is one of the largest in the UK. It processes sludge through its 16 digesters. The facility operated a co-generation plant since the 1990s, however, the engines were approaching the end of their useful lives. At the time, the engines delivered 56GWh of renewable electrical energy sufficient for site demands with an export of 20GWh. However, much of the waste heat was lost and Severn Trent were keen to take advantage of the UK's governments incentives for renewable heat. Therefore, after a study, it was decided to install a biomethane plant – the first of its kind for municipal sludge in the UK. However, a main concern was based on the plant being susceptible to changes in feedstock that might come through into the gas. The biomethane facility was designed to process 49,000 cubic feet/hr of biogas to align with the exported energy levels. The plant also had a unique setup that avoided propane injection - which is typically required due to regulatory standards - that is needed to balance the energy grids. In collaboration with Cadent - the UK's largest gas distribution network, Severn Trent were able to inject the biomethane into a high-pressure tier of the UK gas grid network and by determining how much of the flow Severn Trent contributed, reduced their supplementary fuel injection to nearly zero. The introduction of the Biomethane plant had a secondary effect – it provided a motivation for enhanced anaerobic digestion to maximize the revenue potential from the biomethane. Severn Trent were interested in Thermal Hydrolysis due to a proven increase in digestion performance, and hence biogas production, but at Minworth the grid connection had been capped at 9MW which already was being produced regularly based on existing flows even without enhancing the digestion plant performance. By diverting approximately a third of the energy production onto the grid, Severn Trent freed up sufficient headroom on the grid connection to make an investment in thermal hydrolysis financially achievable. Subsequently, a three stream B6-4 thermal hydrolysis plant provided by Cambi was installed to process 270 tons dry solids/d. The sludge being that produced by Minworth, but also from other facilities which brought cake for processing. Biogas production increased from 5.2 ft3/lb fed to the digester to 7.4 ft3/lb fed. Significant improvements to dewatering and cake quality were also observed. Due to the success of the project, Severn Trent are reconfiguring their digestion infrastructure to enable two stages of digestion. The first on unprocessed sludge using the first 4 digesters, followed by thermal hydrolysis of the partly digested biosolids prior to a second stage of digestion in the remaining 12 digesters. This enables even higher biogas production and increased loading rates. This paper will describe the development of the project, especially referring to the complex challenges involved and lessons learnt. Data will be shown highlighting the influence of a different thermal hydrolysis configuration at full-scale.

Learning Objectives:
The importance of balancing sludge and biogas flows to optimize energy production
To appreciate the complexity in integrating different process equipment

To understand the influence of changing the configuration of thermal hydrolysis once installed to further enhance benefits of dewatering and biogas production

Biography:

Bill Barber is a professional engineer with PhD and degree in Chemical Engineering. Bill has worked in research, consulting for multi-national companies, technical development and sales, and for the UK's largest Water Company, United Utilities where, as a technical advisor, he was part of the team which developed the award winning thermal hydrolysis facility at Davyhulme. He has worked on projects in the UK, Europe, Asia, Australia, New Zealand and North America. Bill has written the IWA textbook on thermal hydrolysis as well as numerous peer-reviewed articles. He is a reviewer for several academic journals related to wastewater and sludge management.

58. Thursday, August 31, 2023
Room 203-204
9:00 AM - 9:30 AM

Title: A Novel Method to Quantify Biosolids Drying Properties

Presenter:
Dian Zhang, PhD
Process Engineer, Stantec

Abstract:
Morris Forman Water Quality Control Facility in Louisville, Kentucky will be one of a few plants that operates rotatory drum thermal drying fed with thermal hydrolyzed and anaerobically digested sludge. Thermal hydrolysis pretreatment (THP) destroys the cell structure and polymeric substances of the solids, leading to improved dewaterability and dryer cake. However, this cake can be less desirable in thermal drying process due to its high fragility and dust generation if the product is over dried and exposed to high shear. Moreover, despite the wide application of thermal drying, a standard method to assess biosolids drying properties does not exist. Therefore, this bench study established a novel and practical method to quantify dried biosolids pellet fragility in a simple setup with controlled variables using a modified Standard Tablet Friability Test developed by United States Pharmacopeial Convention. Based on the established protocol, the study further investigated the impact of sludge composition, THP, and heating intensities on sludge thermal drying properties.

Learning Objectives:
Background understand regarding THP, thermal drying, and dewatering
Sharing a novel practical test method with the community
Report observation regarding drying property of thermally dried and hydrolyzed solids

Biography:
Dian is a wastewater and bisolids process engineer at Stantec. He holds a PhD from Virginia Tech and authored more than a dozen peer-reviewed papers related to biosolids management. Key experiences include pilot studies, design, and business case evaluations for anaerobic digestion, thermal hydrolysis pretreatment, biosolids dewatering, and energy recovery.

59. Thursday, August 31, 2023
Room 203-204
9:30 AM - 10:00 AM

Title: Gasification and Pyrolysis of Sewage Sludge Biomass and Intensification of Pyrolysis

Presenter:
Philip Pedros
Vice President, Senior Process Engineer, Mott MacDonald

Abstract:
The Thermochemical Processes of Gasification and Pyrolysis for Sewage Sludge Biomass Treatment of biosolids generated at wastewater treatment plants have traditionally undergone biochemical transformation either by anaerobic or aerobic digestion or the thermochemical process of incineration. The biochemically digested residuals, after meeting the regulatory requirements could be land applied otherwise sent to a landfill. The final solid products remaining from incineration, the ash, was also sent primarily to landfills. While incineration utilizes the material as a fuel source and reduces the final volume by approximately 95%, it has fallen out of favor over the last twenty-five years due to public perception and the difficulty in permitting. In addition, in some regions of the country landfill space has become limited resulting in residuals being shipped longer distances and often to out of state and at increasing costs. The result has been a renewed interested the thermochemical processes of gasification and pyrolysis which like incineration can reduce the volume of the final material as much as 90 – 95%. Although these processes have been examined before, two issues have spurred the renewed interest. First, both pyrolysis and gasification systems are easier to permit than incineration systems. Second presence of PFAS chemicals in biosolids and the mounting evidence that these chemicals are removed from the resulting char when the processes are operated at the requisite temperatures has also provided impetus to this interest; even though the fate within the resulting gaseous emissions has not yet been determined. This paper will provide a brief history of both processes, discuss the fundamental principles of both gasification and pyrolysis and their difference from combustion. The focus will be on the use of sewage sludge biosolids (SSB) as a feedstock. The difference between SSB and other feedstocks that have been successfully used in both processes will be highlighted. The discussion will include the thermochemical conversions, operating temperatures, (especially as that relates to removal of PFAS compounds from the char), reactor types, design considerations, case studies and a review of current manufacturers focused on the use of sewage residuals as a feedstock.

Learning Objectives:
History of gasification and pyrolysis.
Challenges of processing sewage sludge biomass (SSB)
Introduction of autothermal pyrolysis as a means to intensification of pyrolysis.

Biography:
Dr. Pedros is a Vice President and Senior Process Engineer at Mott MacDonald. He has over twenty seven years of experience as a process engineer with eight patents and experience in: a) process design and operation of biological nutrient removal (BNR) wastewater treatment plants, b) process modelling, c) evaluation, startup and research on side stream treatment processes including physicochemical processes, d) thermal hydrolysis process (THP) and anaerobic digestion, e) digester gas scrubbing, f) energy transfer and the thermal transport properties of porous media BAFs for cold temperature nitrification and g) thermal destruction of nitrous oxide emissions from BNR processes. He has been the

technical lead on BNR, sidestream treatment, anaerobic digestion and CHP projects at various plants ranging in size from 2 – 360 MGD.

60. Thursday, August 31, 2023
Room 203-204
11:00 AM - 11:30 AM

Title: A Simple, Affordable and Novel Facultative MBR Technology – A full scale pilot study at Plymouth Airport WWTF, MA, USA

Presenter:
Helen Littleton
Simultaneous Nitrification/Dentrification (SND) and Aerated Anoxic Conditions Stabilize Mainstream Anammox Operation in IFAS System - 9 Years Experience on Mainstream Deammonification, LX Environmental LLC

Abstract:
Abstract: A full-scale 5000 gpd FMBR pilot operated at the Plymouth Municipal Airport (PMA) WWTF under low DO (<0.3) for 18 months. It has converted the full SBR flow to a FMBR system since inception. The energy consumption was measured at about 44 kwh/d vs. the consumption for SBR of 367 kwh/d. The energy and cost savings are about 77 % and 73%. FMBR showed excellent simultaneous biological nutrient removal (SBNR). Average TN and TP removal are 93% and 90%. Effluent BOD and TSS are under detectable limits. Observed sludge yield is about 0.1-0.3 d-1. 16S DNA sequencing suggested that AOB responsible for most BNR plants were not associated with any known ammonia–oxidizing prokaryote in a FMBR system. 13 DNA samples confirmed that a higher abundance of Tetrasphaera, Dechloromonas, Rhodococus, Nitrospira, Pseudomonas was detected in a FMBR system vs. BNR benchmarks of 18 plants. Proposing that these microorganisms are involved in nitrification/denitrification, bioP removal under low DO conditions. Keywords: SBNR, nitrification, AOB, AOA, Nitrospira, Comammox, Consortium. Introduction: The existing SBR plant was built began operation in 2002 with aerator, mixer and decanter in one unit. Although the current influent flow is under design capacity, the aerator could not be turned down to promote denitrification during anoxic fill. Therefore, energy consumption was high and the system had difficulty facing unstable influent shock loads. In order to meet effluent TN less than 10 mg/l, alkalinity and methanol had to be added. The facultative membrane bioreactor (FMBR) is a low energy membrane biological wastewater treatment process that removes carbon, nitrogen and phosphorus simultaneously in a low DO facultative environment. It encourages a natural microbial competition, maximizing the activity of the mixed biomass consortium. The key to the core technology of the FMBR is that it can operate under a low DO condition to accomplish biological treatment while preventing the membrane from biofouling. The aeration device and self-cleaning pattern are unique. In a facultative environment FMBR has a low sludge yield rate just like most anaerobic systems but without being sensitive to the impact on its treatment performance of toxicity and pH change. Material and Methods: FMBR is a pre-designed compact engineering system with simple controls. FMBR pilot operation started gradually on 11/10/2019 at a water temperature of 8°C. The startup was completed on 12/9/2019. The seeding sludge came from another FMBR system. The FMBR operation pattern is 9 minutes running, 3 minutes self-cleaning. MLSS is operated at 8,000-12,000 mg/l. DO is maintained between 0.1- 0.5 mg/l. 13 DNA samples were analyzed during the pilot by Microbe Detectives. The ChemScan online analyzer was installed and calibrated by a certified lab. Results and Conclusions: After 5 days SBR was initially converted to FMBR, the effluent NH3-N was reduced to 0.2 mg/l and has been maintained at that level since. The effluent TN was less than 5 mg/l without adding external carbon. Despite the plant influent fluctuated considerably, the effluent TN is about 5-7mg/l. The system showed good bioP removal.

Learning Objectives:

Facultative MBR definition: A low energy membrane biological wastewater treatment process that removes carbon, nitrogen and phosphorus simultaneously in a low DO facultative environment.
The core technology of the FMBR is that it can operate under a low DO condition to accomplish biological treatment while preventing the membrane from biofouling.
The aeration device and self-cleaning pattern are unique.

Biography:

Helen Littleton has worked in wastewater industry as a consulting engineer, researcher and wastewater practitioner over 45 years. She holds a B .S. in Sanitary Engineering from China, a M.S. in Environmental Engineering from Penn State and a Ph.D. in Environmental Science from Rutgers University. She is registered PE in PA and DE and BCEE by American Academy of Env. Eng. She is a Fellow of WEF. She is an expert in simultaneous biological nutrient removal and study of nitrifiying community under low DO conditions.

61. Thursday, August 31, 2023
Room 203-204
11:30 AM - 12:00 PM

Title: A New On-site, Standardized Screen Capture Efficiency Sampling & Testing Protocol for all New & Old Wastewater Treatment Plant Screening Equipment

Presenter:
James Impero Mr.
Sr. Engineering Specialist, Ovivo USA, LLC

Abstract:
Decades of third-party capture testing of screens in the UK have been a good thing. However, the screenings capture data proved only the “Capability” of that particular screen tested & under those specific UK flow conditions. Expecting identical capture results from the same manufacture’s screen at wastewater facilities with differing hydraulics, variable wastewater velocities, TSS & FOG loading characteristics, let alone up-front grinders is neither practical thinking or proven in the field to be true for 40%-45% of the current installation history in the US. Why? It is the very subject of this paper & conference presentation. There are definite wastewater similarities from site to site; however, there are also many dissimilarities that require screening equipment modifications to achieve the true screenings capture capability of any manufacturer’s screen. This presentation will discuss an inexpensive upstream & downstream on-site sampling method & procedure, as well as a protocol & accepted test methodology that can be performed at any municipal wastewater treatment facility or local third party laboratory to measure solids capture efficiency of any newly installed screen(s) at startup, including older screen installations that have fallen short of owner expectations.

Learning Objectives:
To discuss what is SCR (Screenings Capture Ratio), where it was developed, utilized as a paid service and what it meant to facility owners, operators & consulting engineers.
To discuss fallacies learned and why the past SCR testing process only provided a screen’s capability and not its actual average screening’s capture when installed at different WWTPs
To share in the process’s protocol, simplicity of equipment, & SCR repeatability of data development that can be used for start-ups or on older operating screen installations

Biography:
I James Impero have been in the research & develop team improving waste water and water treatment screening & filtration designs, testing site installations and developing protocols for product lines for 16+ years. I have been site testing, developing data, improving equipment designs and writing abstracts and papers to document the company's goal in becoming leading experts in the field of water and waste water treatment and design.

62. Thursday, August 31, 2023
Room 203-204
12:00 PM - 12:30 PM

Title: Is Peracetic Acid (PAA)-based Domestic Wastewater Effluent Disinfection the Real Deal?

Presenter:
Michael Kuznetz PE
Chief Engineer, Wastewater, Buchart Horn, Inc.

Abstract:
Peracetic Acid (PAA) disinfection is gaining popularity in multiple states due to the ability to retrofit/reuse existing liquid chlorine disinfection facilities and because PAA does not require de-chlorinating effluent before discharge. Buchart Horn Inc. (BH) is in the process of studying the effectiveness of PAA to achieve compliance with the BTSA wastewater discharge permit disinfection criteria for microbial indicators, such as E. coli. The study will further determine the operating conditions (e.g., PAA dose and contact time) required to achieve such requirements and define the residual concentration of hydrogen peroxide, which is the by-product of PAA hydrolysis.

Learning Objectives:
PAA chemical structure, oxidation potential, and byproducts
PAA disinfection efficiency as compared to that of chlorine
PAA process economics - Determine the Capex (capital expenditures) value required to retrofit a 2.5 MGD chlorine- based facility

Biography:
Dr. Michael Kuznetz has over 35 years of experience in environmental, civil, and chemical engineering and occupational health and safety. He is a professional engineer licensed in 9 US states, a Certified Industrial Hygienist (CIH), and a Certified Safety Professional (CSP). Michael specializes in Water/Wastewater Treatment, Process Engineering, Occupational Health Risk Assessment, and Process Safety Management. He received his BSc./MSc. degrees in Process Engineering from Baku-Azerbaijan Polytechnic Institute, a PhD in Chemistry from Baku-Azerbaijan State U., an MSc. Degree in Civil Engineering from the U. of MO-Columbia and a PhD in Interdisciplinary Engineering from the U. of MO-Columbia in Kansas-City.

63. Thursday, August 31, 2023
Room 203-204
2:00 PM - 2:30 PM

Title: Planning for PFAS? - Leveraging and Phasing Thermal Processes

Presenter:
DJ Wacker
Solids & Energy Area Practice Leader, Brown and Caldwell

Abstract:
The potential for biosolids conversion into fuels and revenue-generating products has driven interest in biosolids pyrolysis and gasification for decades, yet technology adoption has been hampered by historical issues, operational complexity, and high capital outlay. A combination of regulatory uncertainty, public pressure, technology evolution, and an increased offering of technology manufacturers has reinvigorated interest in these technologies as a tool to address today's biosolids challenges. As technology manufacturers and researchers actively work to verify if pyrolysis and/or gasification can destroy PFAS compounds to below detectable limits, many state agencies and utilities await the results of the EPA's risk assessment study on PFAS found in biosolids, set to be released by December 2024. However, destruction of PFAS and future regulations are only one side of the coin. Reliable operation is still a major concern in the biosolids market as there are no full-scale pyrolysis or gasification systems owned and operated by a wastewater utility. That will soon change with at least 10 full-scale domestic projects in various phases of development (design to construction) across the U.S. This presentation will provide a status update on those projects and discuss how some manufacturers of pyrolysis reactors and gasifiers are becoming dryer agnostic to improve scalability and reliability of the entire thermal process train. As a result, this offers utilities additional flexibility as they navigate the evolving landscape of biosolids management. It will provide a summary of an ongoing WRF project on destruction of PFAS in biosolids with thermal processes. The presentation will also provide two case studies in which utilities were planning to implement thermal drying but later pivoted to pyrolysis or gasification. Each project includes different project drivers and criteria for equipment selection. One project will be in construction and is using an unconventional alternative delivery method. The second project is Design-Bid-Build, however, it used an equipment pre-selection process based on both technical and cost parameters. Each of these items will be discuss in the presentation.

Learning Objectives:
If PFAS can be destroyed with pyrolysis, gasification and/or incineration.
Which equipment manufacturers are delivering full-scale pyrolysis and gasification systems for biosolids
How to implement a phased plan in order to manage PFAS concerns with an evolving regulatory landscape.

Biography:
DJ is the Area Practice Leader for Solids & Energy at Brown and Caldwell. He has over 10 years of experience concentrated in planning, design, construction and start-up of wastewater treatment and biosolids facilities. His biosolids experience includes thickening and dewatering, anaerobic digestion, biogas utilization and thermal processes. DJ is a licensed Professional Engineer in 6 states and is an active member of the CWEA RBC and MABA Board of Directors.

64. Thursday, August 31, 2023
Room 203-204
2:30 PM - 3:00 PM

Title: Sod Run WWTP Improvements Project –Harford County's Approach to a Successful Project with a Growing Scope

Presenter:
Maia Tatinclaux PE
Project Manager, RK&K

Abstract:
Harford County Department of Public Works (County) initiated design efforts to upgrade various processes at the Sod Run WWTP in 2018. The facility had undergone significant improvements under the Enhanced Nutrient Removal (ENR) that was completed in 2014 , but several of the unit processes have not undergone upgrades for over forty years. The County originally intended to complete each of three upgrades as independent construction projects with a phased approach. In order to attract more qualified bidders, in 2022, the County combined the three major project designs into a larger, single design and construction project with an estimated construction value of $28M. The three tasks included: 1) Converting the gas chlorination system to UV disinfection to address safety considerations and cost/availability of chlorine. 2) Upgrading the anaerobic digesters to improve performance, gas capture and utilization. Improvements included converting digester heating system to steam injection with new boilers, water conditioning, steam injectors and sludge piping. Also installation of new mixing equipment and digester lids and electrical/I&C renovations. 3) Design upgrades to two of four primary clarifiers constructed in the late 1960's including new mechanisms, drain system, scum vaults and scum pumps. The County's project team includes both engineering and operations with operations staff providing comments and input throughout the project. Project challenges include accommodating facility outages and reduced treatment capacity during construction and lack of documentation of older facilities/site utilities that have been abandoned or modified. Challenges associated with combining the projects in the design phase included coordinating laydown areas, sequence of construction, and site permitting. As individual projects, each improvement would result in limited disturbance but as a single, combined larger project, full site permitting was required. Another challenge of combining design projects was modifying the contract documents to be a cohesive combined set late in the design phase and to configure the documents to address interim completions and staggered acceptances and warranties associated with beneficial use of the three separate work areas. The County is striving to retain a qualified contractor for the project and completed a pre-qualification process where contractors were provided the 95% completed documents and submitted a qualifications package. The County short-listed four construction contractors and only those short-listed contractors are eligible for bidding. The County has retained a Construction Management team that assisted in the review of the qualification packages and the design documents. This presentation will discuss the technical aspects of the improvements and design challenges of combining designs, but largely focus on the County's efforts to assure a successful large-scale project through the use of including the operations team on the design effort, short-listing qualified contractors, re-apportioning funding to attract more qualified bidders by a single, larger project, and the use of the Construction Management team.

Learning Objectives:
To learn about the County's pre-qualification process for construction contractors.

To learn about the complexities of combining three unit process upgrades into a single design late in the design phase.
To learn about the technical components of the primary clarifier upgrades, conversion to UV disinfection, and anaerobic digestion system upgrades including converting to steam injection.

Biography:

Ms. Tatinclaux is a Project Manager with RK&K specializing in wastewater treatment design. Ms. Tatinclaux has worked on a variety of treatment projects in the mid-Atlantic area with a focus on rehabilitation projects. She has an extensive background in biosolids treatment having previously worked as the Process Engineer for the anaerobic digestion system at the Back River WWTP. Ms. Tatinclaux also serves on the Short-Course Committee and teaches biosolids related coursework.

65. Thursday, August 31, 2023
Room 203-204
3:00 PM - 3:30 PM

Title: Development of Dynamic Process Model to Provide Operational Insights for Arlington WPCP

Presenter:
Christine Debarbadillo
Plant Optimization Practice Leader, Black & Veatch

Abstract:
The Arlington County WPCP, located in Arlington, VA, operates under stringent nutrient limits to meet Potomac River and Chesapeake Bay requirements. A whole-plant process model was developed as part of an effort to evaluate plant performance, identify optimization opportunities, and prepare for upcoming capital improvements projects. The project included detailed examination of process operation and a dynamic model calibration effort. In accordance with industry standard practices, wastewater characterization, two calibration efforts, and a one-year dynamic validation supported development of a Level 3 model. The liquid stream processes consist of primary clarification, step-feed activated sludge nutrient removal, secondary clarification, tertiary filtration using deep-bed denitrifying filters, and disinfection. Ferric chloride is typically dosed at two locations, into the primary influent and into the mixed liquor upstream of secondary clarifiers. Further, methanol is dosed to the tertiary filters for denitrification to reach low levels of total nitrogen. The solids train comprises gravity thickening for primary sludge, dissolved air flotation (DAF) thickening for WAS, and centrifuge dewatering of the blended sludge. Dewatered solids are stabilized with lime prior to land application as Class B biosolids disposal. While process models have long been used to support process designs, the operations focus of this model revealed some interesting insights into the plant operation and performance that may not otherwise have been identified. The results provided an opportunity for enhanced understanding of operational practices, performance, and strengths and limitations of the system, and helped define the need to analyze parameters beyond those required by permit to better assess intensification opportunities. The presentation will discuss the resulting trends and how this information was used for troubleshooting and optimization. For example, model predictions of the primary effluent TP, alkalinity, and pH during the validation period generally matched the observed plant data trends. However, in November 2021, the dynamic model was not able to predict an unexpected and significant upward trend in daily primary effluent TP, alkalinity, and pH. This signified an apparent change in an operational parameter that is yet to be confirmed but appears related to changes in ferric chloride chemical quality or mixing/injection during that period. This particular period wasn't originally of concern to operations staff because although there was some variation in the final effluent TP, concentrations were still well within permit limits. A similar example was observed in the dynamic validation results for May and June 2021. The model predictions for secondary effluent TSS and TP closely matched observed plant performance and trends were well represented. Secondary effluent BOD concentrations were under-predicted by the model, but the model correctly revealed a significant upward trend in secondary effluent TSS, TP and BOD. Secondary effluent nitrate matched well much of the year; however, the model under-predicted a significant increase in nitrate in Sept/Oct 2021. The importance of DO control in the aeration basins is highlighted by this difference and work is underway to further assess methanol usage in practice and in the model, along with optimization of DO control.

Learning Objectives:
Development of Dynamic Process Model
Correlation of Process Model to Parameters Modeled and External Parameters
Development of Optimization Scenarios

Biography:
to be provided

66. Thursday, August 31, 2023
Room 203-204
4:00 PM - 4:30 PM

Title: Reduction of Nitrous Oxide Emissions from Biological Nutrient Removal Processes by Thermal Decomposition

Presenter:
Philip Pedros
Vice President, Senior Process Engineer, Mott MacDonald

Abstract:
This paper discusses the analytical research supporting a process technology for the mitigation of greenhouse gases utilizing the thermal destruction of nitrous oxide and volatile organic compounds (VOCs) as a technology that fits into the current goal of reducing the carbon footprint of wastewater treatment plants while simultaneously providing increased flexibility with which to operate a given treatment process. Two separate sources of gaseous emissions at wastewater treatment plants are those from the aeration basins of the biological treatment of the wastewater and the combustion processes within the facility. The combustion processes may include one or more of the following: boilers, operating on fossil fuel or natural gas, combined heat and power (CHP) units, operating on digester biogas or a sludge incinerator. The objective of this research is to link the gaseous emissions of the biological processes to the air intake of the existing combustion processes with the net effect of reducing the total emissions of harmful gases from the facility. The emission of nitrous oxide (N2O) from wastewater treatment plants is of concern due to its impact as a greenhouse gas (i.e 300 times that of CO2) and is a consideration in the ongoing research regarding the nitrite shunt and anammox processes. By using the emissions from the biological reactors as the inlet gas stream to the combustion process the nitrous oxide is removed by thermal decomposition. Thermal decomposition occurs at approximately 565ºF (296 ºC), well below the combustion temperature, N2O splits to nitrogen (N2) and oxygen (O). The oxygen is consumed as an oxidant. Thermal decomposition of nitrous oxide has been implemented to reduce the unavoidable N2O emissions from the manufacture of adipic acid for the nylon industry (Reimer et al. 1994 and Shimizu, Tanaka and Fujimori 2000). In addition to the reduction of nitrous oxide, any hydrogen sulfide (H2S), methane (CH4) or VOCs emitted are also removed. By removing nitrous oxide and VOC emissions from the biological processes ,at wastewater treatment plants, while concurrently reducing the thermal NOx emissions from the, this technology removes some constraints on how the biological process may be operated. For example, in trying to achieve maximum loading rates in a conventional nitrification process, or an anammox process, the concern for nitrous oxide emissions are removed and the process can be operated in the manner that is best for a reduction in energy consumption or resource recovery. The deleterious greenhouse gas emissions from the biological process will be mitigated in any existing (or new) combustion process at the facility.

Learning Objectives:
Issues around Nitrous Oxide Emissions
How to break nitrous oxide to nitrogen gas and oxygen.
Method to remove nitrous oxide emissions from BNR treatment processes.

Biography:
Dr. Pedros is a Vice President and Senior Process Engineer at Mott MacDonald. He has over twenty seven years of experience as a process engineer with eight patents and experience in: a) process design

and operation of biological nutrient removal (BNR) wastewater treatment plants, b) process modelling, c) evaluation, startup and research on side stream treatment processes including physicochemical processes, d) thermal hydrolysis process (THP) and anaerobic digestion, e) digester gas scrubbing, f) energy transfer and the thermal transport properties of porous media BAFs for cold temperature nitrification and g) thermal destruction of nitrous oxide emissions from BNR processes. He has been the technical lead on BNR, sidestream treatment, anaerobic digestion and CHP projects at various plants ranging in size from 2 – 360 MGD.

67. Thursday, August 31, 2023
Room 203-204
4:30 PM - 5:00 PM

Title: Waste & Energy Recovery Lead to Sustainability at the Clearwater WWTF

Presenter:
DJ Wacker
Solids & Energy Area Practice Leader, Brown and Caldwell

Abstract:
The Derry Township Municipal Authority (DTMA; located in Hershey, PA) embodies the "Utility of the Future" to enhance on-site energy savings and energy and materials recovery initiatives by leveraging their current business strategy for co-digestion to develop opportunities to implement self-sustaining facility improvements, minimize future cost impacts to their rate payers, and expanding the capacity of their hauled-in waste program. When it comes to solids management and energy recovery, DTMA's approach includes a series of incremental steps that have led to a larger compounding effect. They have a robust hauled-in waste program that began in the early 1990's when they started accepting septage and fats, oils and grease (FOG). Not only has this increased their production of renewable energy (i.e., biogas), but it has increased their revenue from tipping fees to over $1.5 million per year. In years past, the additional biogas production was used to fuel their thermal dryer, boiler for digester heating and a small combined heat and power (CHP) system. Although the dryer was decommissioned in 2018, it produced a Class A dried product that was beneficially used by local farmers for many years. Electricity produced from the CHP system is used onsite to reduce process demands. This presentation will focus on DTMA's next steps towards sustainability with the completion of Energy Enhancements project in 2023 by improving process and operational flexibility at the plant, enhance their ability to accept additional HSOW, and approach "Net Zero" energy at their Clearwater WWTF. DTMA started accepting food waste in 2017 and plans to accept more upon the completion of its Energy Enhancements project this year. The project includes improvements to the existing secondary anaerobic digester, new biogas conditioning system with a regenerative siloxane removal system, two (2) new 1-MW engine generators, interconnect system and other miscellaneous improvements. DTMA leveraged Pennsylvania's COSTARS program to pre-select and procure their preferred engine generators. The presentation will include lessons learned from construction and commissioning, preliminary data comparing the WWTF's electricity consumed versus production, and the estimated amount of additional HSOW needed to become Net Zero. Direct savings from their electricity bill will be discussed, as well as potential reimbursement through the Inflation Reduction Act (IRA) and revenue from the revamped eRINs program. Although DTMA currently plans to use its generated electricity onsite, generating and selling eRINs may be a driving force to export all renewable electricity to the grid. Fortunately, the new CHP system is interconnected to the local power provider's grid. Lastly, this presentation will provide an update on DTMA's next step in sustainability, which include a new regional gasification system for biosolids management. Upon completion, DTMA will process 100% of its dewatered cake through the new dryer and gasification system, and will eventually accept and process biosolids from neighboring utilities. The update will discuss final design concepts such as cake receiving, permitting hurdles and a construction update.

Learning Objectives:
Sustainability does not happen overnight. A series of incremental steps can have a larger compounding effect.

DTMA's new energy enhancement project leverages their existing infrastructure, improves process and operational flexibility, and will lead to "Net Zero" energy at the Clearwater WWTF.
Not only will their new gasification system produce a high quality end product, biochar, but its efficient energy usage is a large factor in DTMA's "Net Zero" energy goals.

Biography:

DJ is the Area Practice Leader for Solids & Energy at Brown and Caldwell. He has over 10 years of experience concentrated in planning, design, construction and start-up of wastewater treatment and biosolids facilities. His biosolids experience includes thickening and dewatering, anaerobic digestion, biogas utilization and thermal processes. DJ is a licensed Professional Engineer in 6 states and is an active member of the CWEA RBC and MABA Board of Directors.

68. Thursday, August 31, 2023
Room 203-204
5:00 PM - 5:30 PM

Title: Minor Systems, Major Impact – Cost Effective Nutrient Reduction via Minor System Upgrades

Presenter:
Josh Rodgers
Vice President, HDR

Abstract:
In order to meet long-term nutrient reduction goals consistent with Chesapeake Bay total maximum daily load (TMDL) requirements, Anne Arundel County has adopted for implementation a "Our wAAter" integrated approach to nutrient discharge reductions. This approach includes various elements for reductions in nutrient discharge from both stormwater and wastewater sources. As one component of this approach, the acquisition, upgrading, and potential consolidation of minor wastewater treatment systems (e.g. treatment plants under 0.5 MGD) by the County has been identified as a cost effective strategy for achieving substantial reductions in the nutrient discharge to Chesapeake Bay tributaries. This approach includes the County taking responsibility for ownership and operation of privately owned minor systems and upgrading to ENR level treatment for significant reductions in effluent nitrogen and phosphorus. Five privately-owned minor systems with design flows ranging from 0.035 MGD to 0.09 MGD were identified in the southern part of the County for potential County ownership and upgrades, as well as possible consolidation of two or more plants. Conceptual designs were prepared for new County-owned enhanced nutrient removal (ENR) treatment plants to establish preliminary capital and operational costs in order to establish the feasibility and cost effectiveness of this approach. The County's preferred treatment process of membrane bioreactors for nutrient removal was used as the basis for design, and it is assumed that entirely new plants would be constructed due to the age and condition of the existing facilities. Based on the total design flow of 0.35 MGD across all five existing treatment plants and the current nitrogen wasteload allocations (WLAs), the County could achieve nearly 12,000 pounds per year of nitrogen reductions if discharging at 4 mg/L nitrogen compared to existing WLAs. In addition, these minor system upgrades appear to qualify for funding from the Chesapeake Bay Restoration Fund (BRF), which would reduce the financial burden on the County and its ratepayers. For new construction of ENR level treatment plants, a significant level of funding may be available, and preliminary BRF eligibility evaluations were completed for each project site. A main criterion for determining cost-effectiveness is the cost per nitrogen reduction on a dollar per pound basis. Taking into account potential State funding, costs to the County for the minor system ENR upgrades were estimated at under $150 per pound of nitrogen annually, including operation and maintenance costs, over a 20-year period. A detailed evaluation was completed to identify the benefits of the program and financial impacts to the County. In particular, the minor system program was compared to other Our wAAter strategies, including septic to sewer conversions, managed aquifer recharge, and stormwater best management practices. When compared with these other approaches, minor systems were shown to be cost effective.

Learning Objectives:
Understand the cost effectiveness of minor system upgrades
Review how minor systems can be part of a larger overall nutrient management strategy
Understand challenges associated with minor system upgrades

Biography:

Josh is a Vice President and Mid-Atlantic Water Business Group Manager for HDR. He has over 18 years of experience managing and delivering water infrastructure projects. For the past three years, he has been strategizing with Anne Arundel County on the Our wAAter initiative, with a focus on minor system upgrades.

69. Thursday, August 31, 2023
Room 207-208
8:30 AM - 9:00 AM

Title: Strengthening Climate Resilience with EPA's Creating Resilient Water Utilities

Presenter:
Wesley Wiggins
ORISE Fellow, U.S. Environmental Protection Agency

Abstract:
Climate change impacts pose an immediate and long-term threat to the continuity of wastewater, storm water, and drinking water utility operations and water supplies. To reduce the risks associated with climate-related hazards, the Environmental Protection Agency's (EPA) Creating Resilient Water Utilities (CRWU) initiative provides online training and tools designed to educate the water sector on climate science and adaptation options. EPA will highlight the Climate Resilience Evaluation and Awareness Tool (CREAT), an application that guides water utility managers through a climate risk assessment process and helps them evaluate adaptation priorities. EPA will also highlight resources that assist water utilities of any size and at any stage of the climate adaptation planning process, including CRWU's Data Maps, and the Resilient Strategies Guide. This presentation will communicate the real-world challenges and successes of utilities in adapting to the impacts of climate change through a case study from a water sector utility in Maryland who conducted a risk assessment using CREAT.

Learning Objectives:
Learn to conduct a climate change risk assessment with EPA's Climate Resilience Evaluation and Awareness Tool.
Identify climate risks at your water system using EPA's Resilient Strategies Guide and Climate Data Maps.
Hear case studies from water systems that have experienced climate hazards and used EPA's tools to adapt.

Biography:
Wesley Wiggins is an ORISE Fellow working in EPA's Office of Groundwater and Drinking Water under the Creating Resilient Water Utilities or CRWU (pronounced crew) Initiative. He graduated from Princeton University in May of 2021 with a concentration in Geosciences and a certificate in Environmental Studies. Wiggins has previous experience at Smithsonian's National Museum of Natural History, the National Oceanic and Atmospheric Administration, and Princeton University's Office of Sustainability. With the CRWU team, he has organized workshops for different regions of the United States including the Northwest, the Mid-Atlantic, and Alaska.

70. Thursday, August 31, 2023
Room 207-208
9:00 AM - 9:30 AM

Title: The Stage 3 DBPR is Coming: Capital Planning for an Uncertain Regulatory Future

Presenter:
Cory Johnson
Drinking Water Practice Lead, Ramboll

Abstract:
Utilities considering upgrades and replacement to treatment infrastructure need to plan for not only the regulations of today, but regulation impact over the life of the improvements. With treatment infrastructure typically having useful life expectancies of more than 40 years, treatment plants should have sufficient robustness of treatment or at least enough flexibility to make treatment improvements to meet the known as well as the unknown challenges over the life of the plant. However, we all know that this is a nearly impossible task. Utilities typically don't have the capital to plan for all eventualities nor the crystal-ball needed to know what regulations will come into force in the next 40 years—but that shouldn't stop us from trying. As part of the USEPA's Six-Year Review as required by the Safe Drinking Water Act, the USEPA will likely updates Microbial and Disinfection Byproduct (MDBP) regulations. USEPA is currently targeting a formal decision to amend the rules by July 31, 2024 (possibly delayed until July 31, 2025) and final agency action to implement a final rule or withdraw proposal by September 30, 2027 (possibly delayed until September 30, 2028). While nothing has been finalized, USEPA public meetings, the formation of the Microbial and Disinfection Byproducts Rule Revisions Working Group, various industry task forces and work groups, and positioning by industry stakeholders suggests a Stage 3 MDBP rule is more than likely within the next 10 years. As part of the regulatory process, various public engagement meetings have assessed elements related to potential Stage 3 DBPR updates. The meetings included: • Disinfectant Residual Levels and Opportunistic Pathogens (including Legionella) • Regulated and Unregulated Disinfection Byproducts and Consecutive Drinking Water Systems • Distribution System Issues/Tools and Finished Drinking Water Storage • Source Water Protection Considerations and Precursor Treatment/Removal • Sanitary Surveys and Water Safety Plans For planning, these elements should be considered by utilities as they proceed forward with planning for future system improvements and upgrades and assess how any improvements could be impacted or could meet potential changes. Content from the meetings, however, suggest that utilities should focus on disinfectant residual levels in the distribution system and on potential changes to currently regulated DBPs as well as several unregulated DBPs. Greater emphasis should be placed on disinfectant residual levels given rule updates will likely require utilities to maintain a minimum disinfectant residual throughout the system. Increasing the disinfectant dose to raise disinfectant residual levels will increase disinfection byproduct formation. Disinfectant residual increases which result in exceedances of DBP regulations will require improved precursor removal, better management of water age, a switch to alternate disinfectants such as chloramine, or a combination of these and other measures. In addition to minimum residual levels, changes to DBP regulation are being considered. Changes to regulated THMs and HAAs, as well as DBPs not currently regulated including chlorate and nitrogenous DBPs may be included. Bromide and to a less extent iodide have had significant attention in the discussions, especially since brominated DBPs have greater relative toxicity than their chlorinated analogs. A comparison of currently regulated HAA5 with HAA9, which include unregulated brominated HAAs, showed that that HAA9 concentrations were 20 to 25 percent higher than HAA5 concentrations. When there were elevated levels of bromide in the source water, this difference was exacerbated and showed a shift in the distribution of HAAs toward more

brominated species and higher overall levels. Other DBPs discussed include other unregulated DBPs, namely nitrosamines and chlorate. Chlorate and chlorite can co-occur in treated water, especially when chlorine dioxide and/or hypochlorite from bulk solution or on-site generation of chlorine are applied during the drinking water treatment process. Chlorate/chlorite forms largely from the decay of chlorine dioxide or through reactions with contaminants in water. With hypochlorite, chlorate forms primarily due to hypochlorite decay in the bulk storage tank or from onsite hypochlorite generation. The use of hypochlorite bulk solution or on-site generation of chlorine in lieu of chlorine gas has been increasingly popular due to significant security concerns associated with transport and storage of chlorine gas. This paper will discuss the various elements of the rule being contemplated, likely changes, and what utilities should consider when planning treatment upgrades.

Learning Objectives:

Understand potential Stage 3 rule changes
Comprehend DBP formation mechanisms including precursors and oxidant reaction.
Master plan for capital improvements using a risk based approach to regulatory changes

Biography:

to be provided

71. Thursday, August 31, 2023
Room 207-208
9:30 AM - 10:00 AM

Title: An Immersive Journey Through Innovation: Exploring Advanced Water Treatment through Public Outreach

Presenter:
Meghan Robinson
, HDR

Abstract:
As the need to invest in infrastructure and technology increases, it is more important than ever for utilities to educate and engage the communities they serve. Across the nation, utilities are embracing creative ways to enhance and improve their relationships with customers and the general public. The Anne Arundel County (Md.) Department of Public Works has developed a public tour to showcase its advanced water treatment pilot site. This invitation offered a rare behind-the-scenes look into Anne Arundel County's exploration of advanced water treatment (AWT). The County launched its AWT pilot site as it is considering Managed Aquifer Recharge, an innovative way to maintain groundwater supplies while protecting against the impact of continued withdrawals. The County is considering an approach that involves injecting recycled water treated to drinking water standards back into the groundwater. As part of an integrated strategy to engage a range of audiences, the creative team designed an immersive tour experience. Using compelling wayfinding techniques, the team maximized opportunities for interaction throughout the tour experience. Mounted equipment signage translated technical information into easy-to-understand diagrams that illustrated the complexity of each process stage. Attendees also had the opportunity to further their understanding of AWT by visiting a table diagram punctuated with jars of samples that illustrated the quality of the effluent at each process step. Conveniently sized handouts provided attendees with information and context to understand the County's plans. Tour guides and subject matter experts, outfitted with branded attire, served as easily identifiable information sources offering face-to-face engagement and interaction. The visual identity of the materials aligned with the branding of Our wAAter, the Anne Arundel Clean Water Program. Our wAAter content and imagery is based on the values and importance County residents place on water quality, as well as civic pride and shared responsibility. DPW has utilized many of these same graphics and explanations to support an informational website, ourwAAter.org. The Department of Public Works has hosted five tours of the site so far, with the first tour for attendees of the American Water Works Association (Chesapeake section) Mid-Atlantic Utility Conference in October 2022. The tour has also been offered to employees throughout the County's other departments, as well as water professionals from the Maryland Environmental Service, and a citizen Advisory Group. In this session, attendees will: •Learn how interactive techniques can create a fully immersive educational tour •Learn how customized experiences appeal to a range of audiences •Understand how technical and creative teams work closely together to ensure project success

Learning Objectives:
How interactive techniques can create a fully immersive educational tour
How customized experiences appeal to a range of audiences
How technical and creative teams work closely together to ensure project success

Biography:

Meghan Robinson is a senior communications coordinator and environmental scientist with 12 years of experience. Her experience consists of public involvement and community outreach initiatives for federal, state and local clients, and environmental regulatory analysis and compliance. As part of HDR's Mid-Atlantic Strategic Communications team, Ms. Robinson leads programs with teams of communication coordinators, graphic designers, web developers, and GIS specialists. In her role, she works closely with clients creating outreach plans, overseeing stakeholder engagement, and coordinating the creation and distribution of outreach materials.

72. Thursday, August 31, 2023
Room 207-208
11:00 AM - 11:30 AM

Title: Different Treatment Processes for Similar Contaminants: How VOC and Iron/Manganese Removal Affect PFAS Treatment

Presenter:
Lori Kappen P.E.
Sr. Project Engineer, Gannett Fleming, Inc.

Abstract:
Per- and poly-fluoroalkyl substances (PFAS) are a class of compounds in the midst of a developing regulatory process, with some states having implemented MCLs or guidelines for certain PFAS and the federal government establishing proposed limits, health advisory levels, and additional investigation for various PFAs. Many water suppliers have implemented treatment for PFAs at their facilities. Often, groundwater sources where PFAS are present also contain VOCs, iron, manganese, or other contaminants which also require treatment. When PFAS treatment is integrated into an existing facility that includes treatment for other contaminants, consideration must be given to the impacts of the contaminants, and the process to remove them, on PFAS treatment. In some cases, a single treatment process can be used to remove both PFAS and other contaminants, in others a multi-step approach is preferred. This presentation will present several case studies where PFAS treatment was integrated into a treatment facility where VOC and/or iron and manganese removal was practiced. Considerations for PFAS treatment at these facilities included the impacts of existing aeration/air stripping on water pH and calcium carbonate precipitation, potential for fouling of the PFAS treatment process with oxidized iron and manganese, the ability to co-treat PFAS and VOCs and/or iron and manganese in a single treatment process, and the impact of oxidants or sequestrants applied to the water on the PFAS treatment process. The presentation will outline the case studies and the reasoning behind the different treatment trains while treating similar contaminants.

Learning Objectives:
Effects of Co-Contaminants on PFAS Treatment
Treatment of Multiple Groundwater Contaminants

Biography:
I have over 20 years of experience as a Water Treatment consultant with Gannett Fleming. My experience at Gannett Fleming centers on developing recommendations for treatment of new sources or new contaminants, or improving an existing treatment process. My work includes bench, pilot, and full-scale testing; assessment of water quality data to develop potential treatment alternatives; evaluation of alternative treatment concepts; conceptual, preliminary, and final design of treatment processes; and permitting assistance. I have an MS in Environmental Engineering from the University of Cincinnati.

73. Thursday, August 31, 2023
Room 207-208
11:30 AM - 12:00 PM

Title: On-Site Sodium Hypochlorite Generation: A Safe and Reliable Disinfection Alternative to Bulk Sodium Hypochlorite and Gas Chlorine

Presenter:
Tom Caulfield
Senior Product Manager, UGSI Solutions

Abstract:
This seminar will provide water system managers, operators and engineers a practical understanding of the science and implementation behind on-site sodium hypochlorite generation (OSHG) as a source of chlorine disinfection capacity for water and wastewater plants as well as distributed well systems.

Learning Objectives:

Biography:
Tom Caulfield is the Senior Product Manager for the Residual Control products; a suite of technologies designed to monitor and boost disinfectant chemicals in drinking water distribution systems. Tom worked as a Senior Supervisor of Operations at Aqua Pennsylvania for 4 years where he was responsible for 60 well stations and 75 distribution system storage tanks. He began his career with the Pennsylvania Department of Environmental Protection as a Water System Inspector where he helped municipalities maintain compliance with state and federal drinking water quality regulations. Tom has a B.S. in biology from Temple University in Philadelphia.

74. Thursday, August 31, 2023
Room 207-208
12:00 PM - 12:30 PM

Title: Design and Installation of treatment system at Brunswick's Yourtee Spring - Bringing the City's 100+ Year Old Water Source into the Future

Presenter:
Andrew Cooper P.E., BCEE
Associate, WRA

Abstract:
The Yourtee Spring water source has served the City of Brunswick for several generations. The original spring pool wall was constructed by the local native Indian population long before the City of Brunswick existed. Fast forward, the City of Brunswick made modifications to the spring enlarging the pool and using it to serve potable water to part of the area residents. However, it was taken offline following a large rain event in May of 2018. The Maryland Department of the Environment (MDE) determined that Yourtee Spring was ground water under the direct influence of surface water (GWUDI) as indicated by a spike in turbidity levels and the presence of Giardia. Due to the GWUDI designation, the plant's treatment needed to be upgraded to include filtration and addition of UV disinfection. Several challenges presented themselves during the design, including selection of the proper treatment equipment, reuse of existing structures to limit excavation at the site (to protect the spring source), and the remote location of the site (no sanitary sewer service, no 3-phase power). This presentation will provide perspectives from the Owner (City of Brunswick), equipment supplier, and design engineer on how these challenges were overcome resulting in a state-of-the-art treatment system that will serve today's and tomorrow's residents for years to come.

Learning Objectives:
History of the facility and regulations that necessitated treatment upgrades
Technologies and equipment considered and selected
Design and construction challenges and summary

Biography:
Andy Cooper is an Associate with Whitman, Requardt & Associates in Baltimore, specializing in water and wastewater system modeling and planning, design and construction. He holds a degree in Chemical Engineering from the University of Maryland and a master's degree in Environmental Engineering from The Johns Hopkins University. Andy is a registered P.E. in Maryland, as well as a Board-Certified Environmental Engineer.

75. Thursday, August 31, 2023
Room 207-208
2:00 PM - 2:30 PM

Title: Advancing potable reuse in Anne Arundel County Maryland using a carbon-based treatment approach

Presenter:
Ramola Vaidya
Water/Wastewater EIT, HDR

Abstract:
To improve long-term water supply resiliency and water quality in the Chesapeake Bay, the Anne Arundel County, Maryland Our wAAter Program is evaluating multiple management strategies. One piece of this overall program is to evaluate the feasibility of performing indirect potable reuse by adding advanced water treatment (AWT) to an existing County WRF. The AWT processes would further treat wastewater effluent to national drinking water and potable reuse water quality standards with the intent of performing managed aquifer recharge (MAR). A carbon-based AWT pilot consisting of coagulation, flocculation, sedimentation, ozone, BAF, GAC and UV disinfection was installed at the County's Patuxent WRF in September 2022. The AWT pilot will be optimized in the upcoming year to achieve removal of target contaminants, improve overall water quality, identify critical control points, and save operational costs. Multiple samples will be collected throughout the pilot treatment process to adhere to SDWA standards and monitor other water quality parameters and pathogens. These water quality results along with lessons learned from pilot startup and operation will be shared with the audience.

Learning Objectives:
Learn about drivers for potable reuse and managed aquifer recharge in Maryland
Understand key water quality constituents of interest in managed aquifer recharge
Conduct AWT pilot monitoring and identify critical control points

Biography:
Ramola Vaidya is an EIT at HDR's Vienna office. She joined HDR in July 2020 after completing her PhD from Virginia Tech in Civil and Environmental Engineering. Ramola worked at HRSD's SWIFT facility as part of her PhD where her research was focused on removal emerging contaminants using ozone-BAF and GAC. Ramola also has a Master's in Environmental Engineering from Virginia Tech which was focused on anaerobic co-digestion of food wastes and sewage sludge.

76. Thursday, August 31, 2023
Room 207-208
2:30 PM - 3:00 PM

Title: Settling Down to Clean - Handling Design and construction of a Consent Decree Driven Project

Presenter:
Narayan Venkatesan
Technical Manager, Ramboll

Abstract:
Washington Suburban Sanitary Commission's (WSSC) Potomac Water Filtration Plant (WFP) located in Potomac, MD, provides drinking water to people in Montgomery and Prince George's Counties. The Potomac WFP is a nominal 300 MGD surface water plant that draws raw water from the Potomac River and uses conventional and advanced technologies to produce finished drinking water. The Potomac Riverkeeper lawsuit Consent Decree (CD) was lodged and approved by the Court in 2016. The CD requires WSSC to plan, design and implement long term upgrades to the existing Plant or to design and construct a new plant to achieve the effluent limits, conditions, and waste load allocations established by the Department and/or in this Consent Decree" In response to the CD, WSSC submitted the Long-Term Upgrade Plan (LTUP) Report to MDE and Citizen Plaintiffs in December 2016, which was later revised in September 2018. MDE approved the recommendation of the revised LTUP Report to meet the requirements of the Consent Decree. Ramboll completed a value engineering study of the recommended alternative to identify cost savings and define design basis while retaining or enhancing the performance metrics. Due to the extensive nature and scale of the project, three independent design teams were retained by WSSC to complete the design. Ramboll completed the design of the upgrades to the sedimentation basin and treatment of the treatment waste streams. The projects are under construction. This presentation will provide an in-depth analysis of the required design upgrades and will specifically discuss the following: 1. Design collaboration between design teams on schedule, connection points, design basis and data sharing 2. Design of the upgrades to the solids collections systems at the WFP, including upgrades to the sedimentation basins 3. Collection, equalization and treatment of plant waste trains such as sedimentation basin blowdown, filter backwash and backwash to waste, which collectively resulted in 2 MG of storage and a 12 MGD (average day) treatment train. 4. Design challenges encountered and innovative solutions developed to accommodate design of plant retrofits with reduced impacts to plant operations 5. Construction sequencing and critical path construction items. 6. Construction estimate versus bid and impacts of COVID on project cost and construction.

Learning Objectives:
How to develop a design in a very space constrained site with numerous large utilities
Impacts of covid on project cost and equipment lead times (schedule)
How to collaborate and generate consensus on design within a big group of decision makers

Biography:
Narayan Venkatesan is a Technical Manager with Ramboll with over 19 years of experience. He leads design teams on complex projects. He is licensed Professional Engineer in the State of MD.

77. Thursday, August 31, 2023
Room 207-208
3:00 PM - 3:30 PM

Title: Rapid PFAS Treatment Implementation for the groundwater wells

Presenter:
Mamatha Hopanna Water/Wastewater EIT
Rapid PFAS Treatment Implementation for the groundwater wells, HDR Inc

Abstract:
Per- and polyfluoroalkyl substances (PFAS) continue challenging drinking water supplies nationwide due to their ubiquitous presence, persistence, and resistance to conventional treatment processes. The regulatory authority and the utility have been monitoring PFAS in groundwater wells since 2020 with some exceedances of the previous EPA Lifetime Health Advisories for PFOA & PFOS (70 ppt individually or combined). Results from the sampling events indicated that two wells had the highest PFOA & PFOS levels, with the combined concentrations ranging between 200-700 ppt. The combined PFOA & PFOS concentrations for all other wells varied from non-detect to 15 ppt (above the minimum report level of 4 ppt). After evaluating several technologies for PFAS treatment, including ion exchange, reverse osmosis, and granular activated carbon (GAC), the utility has opted to pursue the installation of GAC vessels to mitigate contaminated wells. This presentation will discuss the drivers for GAC, the utility's PFAS treatment goals, and the preliminary design of lead/lag vessels for the source water wells. Design considerations include media selection, backwash and media exhaustion frequency, and fitting the GAC system in the existing pumphouse vs. expanding the building. Furthermore, rapid small-scale column tests (RSSCTs) are being conducted to test GAC media efficacy for multiple well waters. RSSCT results assist with a cost-benefit analysis that considers the efficacy of selected media, carbon usage rates, necessary empty bed contact time, and breakthrough profiles. Overall, the outcomes of this project will assist the utility in securing state funding resources and implementing rapid PFAS treatment using the GAC system.

Learning Objectives:
Evaluation available PFAS treatment technologies such as ion exchange, reverse osmosis, and granular activated carbon (GAC)
Learn about the drivers for pursuing GAC, the utility's PFAS treatment goals, and the preliminary design of lead/lag vessels for the source water wells.
Application of RSSCT to assist in cost-benefit analysis that considers the efficacy of selected media, carbon usage rates, necessary empty bed contact time, and breakthrough profiles

Biography:
Mamatha Hopanna is a Water/Wastewater EIT at HDR and works from Fulton, MD office. She has been with HDR for about two years focusing on water, wastewater, and reuse water treatment processes, design, bench-scale, and pilot-scale projects. She has a doctoral degree in Environmental Engineering from UMBC with a research focus on the fate of emerging contaminants in water/wastewater processes

78. Thursday, August 31, 2023
Room 207-208
4:00 PM - 4:30 PM

Title: Whoa there! When the Contractor's field observations send you back to the drawing board for a better outcome.

Presenter:
Andrew Freitas
Water Resources Engineer, Carollo Engineers

Abstract:
Tertiary filtration underdrains are often broken into two styles: nozzle and block. Each has advantages and disadvantages. Often, rehab of existing filters means replacing the existing underdrains with newer versions of the same style. Filter design can lead to single technology lock-in. Because of this, the Conceptual Design recommendation for filter underdrain upgrades to the DC Water Blue Plains Advanced Wastewater Treatment Plant focused on block underdrains. Their filter facility had used block underdrains since original construction in the 1970's, why change now? However, when presenting the Draft Design package to the Owner, the Contractor provided new information gathered during repair of existing off-line filters. The existing concrete fill had been compromised, causing voids to form between the overall structure and fill. This fill would require complete removal. Therefore, a major assumption – filter rehabilitation would proceed without full-scale concrete fill demolition – was no longer true. Given this info, new underdrain technologies became viable. Alternatives analysis was revisited to compare nozzles and blocks focusing on performance, constructability, maintenance considerations, media options, and cost. Ultimately, the previously not considered nozzle underdrain was determined to be the best option moving forward the following reasons: - Underdrain Height: nozzle height was no longer a disadvantage - Future Flexibility: nozzles can be easily changed to accommodate any filter media configuration that could be required for future regulatory compliance - Structural Integrity: nozzle floors are built as a reinforced monolithic pour and have lower history of failure due to uplift forces - Maintenance: individual nozzles can be replaced should they break, thereby minimizing maintenance costs - Accessibility: access to the underside of the nozzle underdrains is feasible in the filter cells by way of the existing personnel access hatches, providing significant advantage locating any failures that may occur - Life Cycle Cost: nozzles are cost competitive with block over proposed facility lifespan

Learning Objectives:
Comparison of nozzle and block underdrain technologies
Discussion of benefits of engaging Contractor during Design

Biography:
Andrew Freitas is a water resources engineer with 11 years of progressive experience in water and wastewater treatment facility planning, design, management, and construction services. Mr. Freitas specializes in process mechanical design, with significant focus on pumping and unit process treatment.

79. Thursday, August 31, 2023
Room 207-208
4:30 PM - 5:00 PM

Title: Best Practices of Enhanced Biological Phosphorus Removal (EBPR). What You Can and Cannot Control.

Presenter:
Nick Barczewski
Product Manager, Ovivo

Abstract:
EBPR configurations have been successfully implemented in our industry for decades. These systems utilize the unique ability of polyphosphate accumulating organisms (PAOs) to assimilate large amounts of phosphorus and store it intracellularly as polyphosphate granules. Phosphorus then exits the treatment plant within the biomass wasted from the plant, enabling utilities to meet their effluent TP permits in an environmentally friendly and cost-effective manner. The implementation of EBPR is relatively simple. PAO populations grow in EBPR plants by cycling the biomass through anaerobic and aerobic phases. The typical design approach is to add anaerobic selectors before the aerobic basins and develop EBPR from there. From a technology perspective, nothing more than small tanks, mixers, and perhaps ORP probes are needed for the anaerobic selectors. Nevertheless, there are variables involved in keeping a balanced cycle of phosphorus release and uptake carried out by PAOs that wastewater practitioners, operators, and technology providers cannot control. However, there are tools in the toolbox to help control some of these variables, either in the design phase or with operating strategies, to best optimize Bio-P removal efficiencies. This presentation will address the following: 1. Importance of Volatile Fatty Acids (VFAs) in EBPR. 2. Competition for VFAs and tools in the toolbox to control this. 3. Secondary Phosphorus release and strategies to combat it. 4. How to alleviate phosphorus return from sludge handling recycles. These design practices will be presented based on the experience of Ovivo with two EBPR configurations within the Carrousel® oxidation ditch family: the A2C™ and the AlternatIR™ systems.

Learning Objectives:
To understand the basics of EBPR.
The role of VFAs in EBPR and design and/or operational strategies to preserve them.
Options to alleviate phosphorus return from solids handling recycle streams.

Biography:
Nick holds a bachelor's degree in civil-environmental engineering and has 8-years of experience in the municipal wastewater treatment industry. His background includes water quality management and application engineering in technologies such as oxidation ditches, SBRs, ballasted technologies for both secondary and tertiary treatment, diffused aeration, and carbon diversion. Nick is currently a Product Manager with Ovivo, managing and designing Carrousel® and Aerostrip® systems.

80. Thursday, August 31, 2023
Room 207-208
5:00 PM - 5:30 PM

Title: How Flushable Plastics, Disposable Wipes & Grinders Affect the Performance & Maintenance of Headworks and Membrane Protection Screens

Presenter:
James Impero Mr.
Sr. Engineering Specialist, Ovivo USA, LLC

Abstract:
This presentation with supporting pilot plant & field data focuses on why velocity & headloss are the two most important characteristics in understanding how screens are properly sized, maintained & operated. CFD (Computational Fluid Dynamics) analysis with SCR (Screenings Capture Ratio) data reveals the direct relationship velocity & headloss have on a screen's capture efficiency & performance. It emphasizes & disproves the myth as to why matting of solids onto screening surfaces will ultimately over time reduce the screenings capture efficiency rather than improve upon it as many believe. The presentation will also emphasize the aperture requirement for removing 2 dimensional versus 3 dimensional solids, as well as explain & document how small size debris that passes through 6mm, 3mm, 2mm holes, slots or mesh is capable of re-agglomerating (re-combining) downstream into large clumps & bundles of fibrous debris, commonly known as ragging. This debris fouls downstream processes requiring higher maintenance & increased cleaning cycles. A screen's effluent quality affects the lifespan and operation & maintenance of all downstream systems & monitoring equipment, especially tertiary membrane systems & their aeration manifolds. The laboratory & field data provided in this presentation will not only explain the importance of aperture selection & identify potential problematic sources but explain the direct relationship headloss & velocity have on the performance & quality of effluent exiting a screen. All headworks & membrane protection screens manufactured today share the same velocity & headloss limitations that affect their performance & debris capture. Both lab and site data will demonstrate & support the conclusions shared in this presentation.

Learning Objectives:
To discuss site generated lab data to understand the direct relationship that (CFR) velocity and headloss of a screen have on its Screening Capture Ratio (SCR) & capture efficiency
Understand how & why disposable wipes, human hair, plastics & grinders cause debris to bypass coarse & fine screens re-agglomerating into stings & rags that contaminate downstream process equipment
Provide information for understanding the difference in the removal of a 2 dimensional versus 3 dimensional solid & how a screen panel aperture & thickness affects a screen's performance

Biography:
I James Impero have been in the research & develop team improving waste water and water treatment screening & filtration designs, testing site installations and developing protocols for product lines for 16+ years. I have been site testing, developing data, improving equipment designs and writing abstracts and papers to document the company's goal in becoming leading experts in the field of water and waste water treatment and design.

81. Thursday, August 31, 2023
Room 215
8:30 AM - 9:00 AM

Title: Asset Protection: Several Case Studies in Sustainable, Resilient Solutions

Presenter:
Danielle Hankins
Project Delivery Leader, RK&K

Abstract:
WSSC provides water and sewer services to approximately 1.8 million residents of Montgomery and Prince George's Counties in Maryland. The agency ranks among the largest water and sewer utilities in the country, encompassing a service area of nearly 1,400 square miles. Directly from their mission statement, "we are entrusted by our community to provide safe and reliable water, life's most precious resource, and return clean water to our environment, all in an ethical, sustainable and financially responsible manner". As population has continued to boom across the Mid-Atlantic region, so has the strain being put on the aging infrastructure. Constant development and urbanization over the last two hundred years have forced water and sanitary sewer assets further into stream valleys, which are already too narrow to handle the ever-increasing peak storm flows. As a result, the infrastructure along these stream corridors is subjected to highly erosive forces with greater frequency than ever before. For decades, the common solution to asset protection has been to armor the deteriorating infrastructure by placing riprap and concrete. This approach often only provides a temporary fix to the ongoing permanent problem caused by the instability of the stream environment. What if we were to take a more holistic and sustainable approach to how we protect these important public assets? We will explore the tools used to better understand the dynamics of the existing stream system, the causes of its degradation/instability, and evaluate potential design alternatives for long-term sustainability. We will also discuss the additional benefits that an integrated stream restoration and infrastructure stabilization project can provide in an urban environment. RK&K is working hand-in-hand with WSSC to provide sustainable asset protection for several broken or exposed utilities within their utility service area. We will showcase efforts of planning and identification, design, permitting, construction support and project closeout. By providing resilient solutions to utility crossings, we are able to repair systems to provide more holistic sustainable solutions for long term gain.

Learning Objectives:
This presentation showcases several case studies in environmental sustainability.
We will highlight pillars of economic viability, environmental protection and social equity.
Lastly, we will share stories of engaging stakeholders, securing permits and provide lots of photos of pre and post construction activities.

Biography:
Danielle Hankins is a Project Delivery Leader at RK&K in the environmental, water resources department with 20+ years of experience in program management and design for various state, county and municipal civil engineering projects. She has completed planning, all phases of design development including contract documents and construction, MS4 permit planning, management and execution and staff training and process documentation for various clients.

82. Thursday, August 31, 2023
Room 215
9:00 AM - 9:30 AM

Title: What Happens When You Can't Get There From Here? The Challenges of Multiple Reclaimed Water System Planning

Presenter:
Yvonne Picard P.E.
Senior Project Manager, Atkins

Abstract:
In 2019, Indian River County (IRC) Florida contracted with Atkins NA to produce a Reclaimed Water Master Plan for IRC Utilities. The reclaimed water system consisted of the reclaimed water from three Water Treatment Facilities (WWTFs) and a storage and repump station. The four IRC facilities create a consecutive system with each of the facilities impacting the succeeding facilities. The original intent of the Reclaimed Water Planning was to assist IRC in identifying new reuse customers and determining the reuse system improvements required to facilitate the addition of the new customers. This objective was based on a simplistic water balance comparing available reclaimed water from all three WWTFs to current and anticipated demands through 2040. This water balance showed a surplus of reclaimed water. However, after multiple hydraulic and mechanical evaluations and discussions with IRC Staff, it was determined that having surplus reclaimed water in a consecutive system did not necessarily mean that it was available to meet customer demands. An evaluation of current operational constraints quickly became centered on the interdepend nature of IRC's reclaimed water facilities and infrastructure. This interdependence included the following operational considerations: • The South WWTF is dependent on the West WWTF for disposal of surplus reclaimed water. • The West WWTF must have the ability at all times to dispose of or transfer the reclaimed water coming from both West and the South WWTFs. • The reclaimed water from both the South and West WWTFs are needed to meet the reuse system demands in the Central and North service areas where 90% of the demand is located. • Refilling the North Reuse Facility storage tank is hydraulically dependent on reuse demands in the Central service area. Learning about the operational limitations of each WWTF and how those restrictions would affect succeeding facilities became the major objective of the planning. To capture this information, analysis of each reclaimed water facility was conducted, starting from the furthest point and working our way through the network to the succeeding facility. These statistics were essential in creating a Capital Improvement Plan (CIP) for the reclaimed water system. In the end, the question of "Can we get there from here?" was answered and challenges were defined and addressed, although not always as anticipated. In this presentation, the methods that were used in the creation of the IRC Reclaimed Water Plan will be discussed and various important takeaways for planning consecutive reclaimed water systems will be highlighted. This study can be scalable or can be implemented to any other utilities that are proactively looking in water reuse.

Learning Objectives:
You will learn how you estimate water reuse requirements and what is available.
You will be able to understand the step-by-step evaluation process for reclaimed water system.
Also, you will learn how you can consolidate multiple consecutive reclaimed system into single system.

Biography:

Yvonne Picard, PE is a Senior Project Manager and Lead Process Mechanical Engineer at Atkins in Orlando, FL. Ms. Picard has over 35 years of experience in water and wastewater and has been involved in all aspects of water and wastewater projects from master planning to construction services and has a great fondness for the design and construction services associated with solids handling processes. Over the past decade, Ms. Picard's has been focused on the creation and implementation of capital improvement projects, execution and delivery of large water and wastewater projects, and evaluating and improving process delivery processes.

83. Thursday, August 31, 2023
Room 215
9:30 AM - 10:00 AM

Title: Staff Growth to Meet Equity Objectives and Urgent Technical Requirements

Presenter:
Gary Geck
Territory Manager, Mott MacDonald

Abstract:
The client objective is to replace 1700 lead services lines within one year, using equity metrics to select the locations and the staff to work on the project. Because of a long, trusted relationship, they provide this opportunity to our existing team and the clock starts ticking immediately. The organization of the project team, sub-consultant arrangements, and execution of hiring staff quickly becomes the critical path to success on this high profile objective. The assignment quadruples the project team adding sixty people and requires finding and adding several new sub-consultants to the team. The topic project is the DC Water Lead Free DC program, but the presentation will be from the viewpoint of the consulting engineering companies that supported the first two years of the program. It will focus on contractual obligations, staff recruitment and hiring in a very tight labor market, ensuring that invoicing and cash flow meets normal expectations, all while also accomplishing the technical needs of the project. It is urgent project management with an important equity objective. Attendees will also be provided with the lessons learned and successful tools used to achieve such a significant staffing variation, while still maintaining contractual obligations. This will include: accelerating supplemental agreement approvals; establishing new sub-consultant compliance approvals in an accelerated manner; maintaining a monthly invoicing process that quadrupled in size; interviewing and hiring new staff, training, and having them working efficiently; establishing new communications and data management protocols; and ultimately resolving problems that arise from implementing and constructing infrastructure improvements with a brand new team of individuals assembled in the middle of the Covid pandemic.

Learning Objectives:
Funding for infrastructure rehabilitation should also include equitable work opportunities
Project staffing increases are simplified with programmatic organization
Communication plans and data management is critical to large teams

Biography:
Gary Geck is professional engineer and urban planner, specializing in water distribution system programmatic improvements. He has worked in the Chesapeake Region for more than 36 years.

84. Thursday, August 31, 2023
Room 215
11:00 AM - 11:30 AM

Title: Utilizing a Decommissioned Rock Quarry for a new 1-Billion Gallon Reservoir for Sustainable Use of the Region's Water Supply.

Presenter:
Chris Waters PE
Project Manager, Arcadis

Abstract:
This regional water supply project will convert a retired rock quarry into a water supply reservoir. The integration of this new 1-billion gallon reservoir will help mitigate the impacts of a drought or water quality challenges and provide a more sustainable and resilient water supply through water banking. The project includes improvements to the rock quarry so that it is suitable to serve as a water supply reservoir and a new 40-million-gallon per day pump station to transfer stored water from the rock quarry to the local water treatment plant. The new system will include a 300-foot-deep pump shaft and, to optimize water quality, three withdrawal tunnels at varying elevations. A series of vertical submersible raw water pumps will be used to transfer water from the reservoir to the water treatment plant. This presentation will look at how component siting can provide opportunities for cost savings and operational flexibility. Additionally, the importance of water quality modeling to establish critical design parameters such as the reservoir fill and withdrawal elevations will be discussed. The selected quarry reservoir geometry and operational approaches will help to facilitate the optimization of water quality resulting in reduced chemical use at the water treatment plant and improved treatability. The use of retired quarries as water supply reservoirs is increasingly being considered by Virginia municipalities to enhance resilience and provide system reliability. This presentation will discuss the critical decisions made during the planning and design efforts for one of the region's largest quarry reservoir conversion projects.

Learning Objectives:
Best practices for quarry conversions implemented for the sustainable use of water resources.

Biography:
My name is Chris Waters and I am a Project Manager with Arcadis. I have 25-years of experience in the planning, design, and construction of water supply and treatment projects.

85. Thursday, August 31, 2023
Room 215
11:30 AM - 12:00 PM

Title: Winter storms, power outages, flooding… with increasing impacts of disruptive events, where does one start planning for and building resilience?

Presenter:
Alana Gildner
Asset Management Engineer, Black & Veatch

Abstract:
Secure and resilient water (drinking water, wastewater, and stormwater) infrastructure is critical for citizens and the security of the nation. With a rapid increase in billion-dollar natural hazard events, the case for infrastructure resilience is clear. However, the best path to ensuring resilience of this infrastructure is the subject of significant discussion and debate. The path toward ensuring the water industry's infrastructure resilience is complicated by the fact that there are numerous regulations, guidelines, and frameworks related to resilience assessment, management and preparedness. The America's Water Infrastructure Act of 2018 (AWIA) risk and resilience requirements created an opportunity to develop a baseline assessment and consider improvements for water systems. The range of requirements and available resources makes it very daunting for utility management teams to understand and choose among the various 'guiding lights' which are most appropriate given their circumstances. To address this, the Water Research Foundation selected Black & Veatch to develop a Resilience Practical Framework (RPF) so that water utilities in different geographic locations and of various sizes can readily find practical tools and information applicable to their respective situations. Specific steps of the RPF include the following: developing a tailored definition of resilience for their use, informed by industry-wide definitions with appropriate revisions given the specific circumstances of each utility; identifying the 'current state' of their utility's resilience posture; determining what the desired 'future state' is given their circumstances; in essence, determining whether the future state will be primarily regulatory or compliance-focused or whether to pursue 'best practices', 'good practices', 'competent', or land somewhere in between; completing a gap assessment in terms of resilient infrastructure, relative to their desired status; reviewing a mapping tool with the most relevant identified standards, guidelines, and tools to assist in reaching their desired 'future state;' and determining the most appropriate responses to addressing gaps and an improvement plan which could include some combination of planning changes, operational changes, organizational changes, and/or capital investments in infrastructure. This presentation will provide a summary of the RPF approach, including a descriptive journey through the various steps of the framework and associated tool, to enable participants to consider how this framework could be used to improve their utility's overall resilience posture. The study was sponsored by the Water Research Foundation and completed between 2020 and 2022. The study was supported by 20 participant utilities which contributed to the problem definition, provided technical oversight, developed case studies, and tested and provided feedback on the Resilience Practical Framework and the associated tool.

Learning Objectives:
Help water utilities of all sizes, locations, and types understand what practical tools and information is available to them in their pursuit of resilience.
Make the case for the importance of utility resilience; helping utilities understand growth opportunities regardless of resilience stance.

Review the WRF-5014 project including the development of a resilience practical framework.

Biography:

Alana has developed a variety of skills in the evaluation, design, and delivery of projects involving water and wastewater treatment and conveyance processes. Her work experience focuses on asset management, with emphasis on risk analysis and management, resilience-based planning, risk-based prioritization, condition assessment, and business case analysis. She has 7 years of experience in the water, wastewater, utility management industry.

86. Thursday, August 31, 2023
Room 215
12:00 PM - 12:30 PM

Title: Don't Just Collect a Treatment Plant's Operational Data - Leverage it!

Presenter:
Ryan Brown PE
Technical Systems Engineer, Autodesk

Abstract:
Water resources need more resiliency in the face of climate change. This is especially true when it comes to operating and managing water and wastewater treatment plants. But, with the complexities of these systems, monitoring them and ensuring their optimal performance to build that resiliency can be a cumbersome task. Within SCADA systems alone, it's often difficult to manage and leverage the necessary data. Instead of simply collecting this data in LIMS software or spreadsheets, through SCADA systems, or manual records, this data can be aggregated into a centralized database in order to be properly leveraged. By centralizing and adding applicable externally collected data, customized ad-hoc calculations can be performed along with analyzing trends over time. This becomes amplified once artificial intelligence (AI) and machine learning (ML) are applied to these trends in order to see the things that humans have trouble identifying. With the ability to analyze trends, calculate parameters in real-time, and optimize it with AI and ML water and wastewater treatment facilities can being to: • Efficiently track and manage energy costs • Optimize chemical dosing • Automate daily and monthly reporting • Set alerts to make sure the facility is operating at an appropriate level of service. Attendees of this session will gain a better understanding of how to get a system like this up and running with custom analytics, better balance the need for regulatory compliance with better efficiency, and ultimately provide better tools for all stakeholders to more efficiently maintain and operate water and wastewater plants. With this framework in place, operators can make more informed decisions today about how to best operate the plant tomorrow.

Learning Objectives:
Understand how to a centralized data platform is put together and how it can be leveraged for better operations - both expected and unexpected
Break down the complication that comes with new and emerging technologies into more digestible steps
Work smarter, not harder - learn how data already collected can be used to optimze treatment processes

Biography:
Ryan has over ten years of experience in the water, wastewater, and stormwater industry. He has focused on hydraulic modeling for design, analysis, and other digital applications of water, wastewater, and stormwater-related data systems for much of that time. His expertise also extends to FEMA floodplain compliance and transportation hydraulics design. Ryan Holds a BS in Biosystems Engineering from Clemson University and an MS in Biological and Agricultural Engineering from NC State University. He is a registered professional engineer in the state of North Carolina.

87. Thursday, August 31, 2023
Room 215
2:00 PM - 2:30 PM

Title: From Soup to Nuts: Using Digital Twins to optimize your water system from source to customer

Presenter:
Mike Bernard
VP of Business Development, Specific Energy

Abstract:
Digital Twins (DTs) are essentially physics based representations of what should be going on coupled with analyzed sensor data that shows what is going on. This presentation will showcase how the cities of Lakewood, CA and Murfreesboro, TN used digital twins to optimize their water systems from the moment they start with different raw water sources all the way through their distribution systems and ultimately to the customers. Murfreesboro first applied DTs to their raw, membrane feed, and high service pumping systems where they substantially reduced their electrical operating expenses by allowing operators to see, and then adjust pump operating conditions to assure that they stayed within the Preferred Operating Ranges (PORs) for the equipment. They then extended their use of digital twins to the distribution system, which allowed them to reduce water ages, reduce chlorine dosages, and reduce distribution byproducts by controlling the flow to each distribution storage tank. Lakewood's primary challenge is pumping efficiently through varying demand periods coupled with high electrical rates that are also variable. The DT here allows operators to choose the most efficient combination of pumps and speeds from approximately 2.2 trillion different possibilities. This data is also injected into their hydraulic model to give their staff a real-time look at how water moves through their distribution system. You cannot optimize what you do not analyze. Digital twins are a cost effective means to analyze massive amounts of data quickly to provide water professionals better insights into how to design, operate, and manage water systems to assure the level of service customers deserve.

Learning Objectives:
This session will show how digital twins can help operators, managers, and engineers to design, operate, and maintain pumping and distribution systems better.

Biography:
Mike Bernard is Vice President of Business Development at Specific Energy. He spent 24 years as a design consultant and principal at an engineering firm in Nashville where he was involved with a myriad of innovative design projects in both water and wastewater involving technologies like membrane filtration, advanced oxidation, hypochlorite generation, nutrient reduction, and beneficial reuse of both biosolids and effluent. He came to Specific Energy because he believes that this technology has the potential to help operators operate better, managers manage better, and engineers engineer better systems.

88. Thursday, August 31, 2023
Room 215
2:30 PM - 3:00 PM

Title: Evaluating Metering Program Health and Advanced Metering Infrastructure System Performance: Adapting to a Mature Metering Program

Presenter:
Brian Zuidervliet
Environmental Engineer, CDM Smith

Abstract:
A utility's economic health and customer service relations rely heavily on the performance of the utility's water metering and Advanced Metering Infrastructure (AMI) systems; however, metering system growth, aging AMI hardware and software, and the rapid advancement of technology require utilities to develop strategies proactively that align with the utility's goals, budget, and customers' expectations. This presentation includes a case study of Cary, NC and the strategic evaluation of their metering and AMI program used to identify key performance indicators, staffing needs, opportunities to improve hardware and software functionality, and develop strategies to revitalize the metering and AMI program to continue providing exceptional customer service.

Learning Objectives:
Understand processes for evaluating and improving metering and AMI system operations and maintenance.
Be able to identify challenges associated with implementing and maintaining a metering and AMI system.
Be able to develop strategies for transitioning to a mature AMI system

Biography:
Brian is an environmental engineer with experience in advanced metering infrastructure (AMI), and meter selection and program assessments. He has conducted several metering and AMI program assessments, which included evaluating cost benefits of adopting AMI systems, review of business processes, surveys of regional utility practices, and recommendations for improving metering and AMI system operation and maintenance. In his spare time, Brian enjoys hiking, playing the drums, and spending time with his family and cat.

89. Thursday, August 31, 2023
Room 215
3:00 PM - 3:30 PM

Title: Planning, Preparation and Practice Minimizes Downtime - Lessons learned from three years of THP shutdowns

Presenter:
Stephanie Spalding PE, ENV SP
East Region Biosolids Lead, 548

Abstract:
One of the biggest factors when considering the implementation of thermal hydrolysis with anaerobic digestion is how to minimize the impacts of the required annual shutdown of the THP and steam generation equipment to the remainder of the solids processes. This presentation will share the lessons learned over three years of executing and recovering from planned – and unplanned! – shutdowns of THP, including operations and maintenance-led improvements reducing the duration required for solids storage, temporary operations and related operational complications. The first North American installation of the Cambi B6 modular THP was installed at the HRSD Atlantic Treatment Plant (ATP) in 2019 and started up in March 2020. The drivers for installing THP at ATP were to achieve Class A biosolids, maximize existing digester capacity, improve final product dewaterability, stackability and minimize storage requirements, in addition to receiving FOG to improve biogas production. Each year, the THP pressure vessels (Pulper, four Reactors and Flash Tank) require inspection, resulting in a planned shutdown of this critical system requiring storage of liquid and dewatered solids upstream of THP as well as an interruption of feed to the anaerobic digesters downstream of the THP and temporary hauling of unstabilized pre-dewatered cake. At the ATP, as with many THP installations worldwide, there is no redundancy of the THP train and therefore it has been critical for the plant to develop and optimize processes to perform the required cleaning, inspection, and maintenance activities while minimizing the shutdown duration and expedite the return to normal operations. Since commissioning, HRSD has conducted three planned “turnarounds”, as well as experienced a handful of unplanned shutdowns that required quick responsiveness for repairs. After each shutdown, the staff have reevaluated performance, documented lessons learned and revised processes to improve the next one. Through this process of refining and updating guidance documents, ATP has optimized to a 5-day shutdown, from stopping feed to the THP to returning the solids processes to normal operations. This presentation will provide lessons learned from these shutdowns and the approach taken by ATP to efficiently perform the required tasks and develop guidance for SOPs, staffing plans, and spare parts inventories. These lessons help ensure that the time for THP downtime, temporary operations and impacts to the rest of the solids handling processes are minimized.

Learning Objectives:
Lessons learned reduce duration and downtime for THP equipment inspections and maintenance.
Recurring causes for unplanned shutdowns of Cambi THP B6
Key tools developed by O&M staff to efficiently conduct annual shutdown and inspection of THP equipment.

Biography:
Stephanie Spalding is the East Region Biosolids Lead for HDR and specializes in biosolids pretreatment and advanced anaerobic digestion, as well as dewatering equipment replacements, including equipment

evaluations and complicated retrofits into existing facilities. She has led preliminary design, technical specification, and technology evaluations of the THPs processes as well as facilitated contract negotiations for multiple THP facilities in the US. Stephanie has devoted considerable time over the last decade researching the operations and maintenance of operating THP facilities in the US and abroad having visited more than 20 operating THP facilities. She serves in a QA/QC and technical advisory resource for many HDR projects involving THP and thermo-chemical hydrolysis projects.

90. Thursday, August 31, 2023
Room 215
4:00 PM - 4:30 PM

Title: Common Corrosion Questions for O&M

Presenter:
Andrew Fuller
Corrosion Practice Technical Lead, Black & Veatch

Abstract:
As we seek to be good stewards of our utilities it is important to maximize the return on our investments. Extending the life of our assets often improves that return. Decisions are made every day that affect the longevity of our water infrastructure. From the significant, pipe bedding and material selection, to the mundane, fastener materials and cleaning solutions. This presentation seeks to give quick answers to common questions about water systems that corrosion engineers receive on work done every day. Buried assets are particularly hard to access and vulnerable to corrosion. For these reasons, it is especially important that maintenance is performed in a manner that will resist corrosion. Emergency repair work rarely allows time to debate construction methodologies so it is important to follow standard practices. This presentation focuses on operation and maintenance practices performed every day and how corrosion engineering can be employed to minimize the potential for corrosion. Common questions like when and how to use isolation, what materials should be used for fasteners, and what exactly is an insulating fitting will be addressed. These are often an area of concern as they tend to be more vulnerable to corrosion and have more significance in its prevention. Anodes, galvanic and impressed current, raise many questions. When are they a safety concern? What should be done with the wires? How can you tell if they're working? What are the opportunities for anodes during regular maintenance? Additionally, common questions about protective coatings will be addressed.

Learning Objectives:
What are the types of anodes used for CP in water systems and how should they (and their wires) be handled
How does electrically isolation help prevent corrosion and what makes up insulating fittings
How are coatings used to prevent corrosion in different environments and what are some common mistakes in their selection and application

Biography:
Andrew is a registered PE and certified Cathodic Protection Specialist with Black & Veatch. As the corrosion practice technical lead he focuses on producing high quality corrosion evaluation and mitigation products. His team's primary responsibilities are: cathodic protection, protective coatings and linings, corrosion modeling, integrity testing, root cause analysis, and rehabilitation.

91. Thursday, August 31, 2023
Room 215
4:30 PM - 5:00 PM

Title: Starting Simple: Digitizing Small/Medium Utilities from Data to Insights

Presenter:
David Archard
Business Manager, Waterly, LLC

Abstract:
As “normal sized” utilities across the US look at the budgeting reality of decreased water revenues (largely from water conservation efforts and lingering COVID-related economic effects) alongside the pressure of non-revenue water requirements and increasing regulations, solutions that stretch and maximize existing investments are going to rule the day for the near term. While many utilities would like to make capital investments in more comprehensive and sophisticated digital water solutions, a more incremental approach seems to be more favored at this time. This presentation will address the realities of squeezed capital budgets, shifting water data management into a service-based (cloud) approach amidst strict cybersecurity adherence, as well as the very real human side of dealing with new technology in day-to-day operations of a typical (not super large) American small and medium sized water and wastewater systems. We will address these realities with some fundamentals and best practices of today’s digital water presented in the context of a couple of Indiana small and medium utility case studies.

Learning Objectives:
Understand the benefits cloud technology can provide with existing infrastructure and review use case where utilities were able to improve productivity by replacing manual and redundant tasks
Learn how open API and data standards between vendors accelerate utility digitization.
Learn how utilities can effectively leverage existing instrumentation and fully digitize to the cloud for less than $1500/instrument.

Biography:
David is one of the original architects of the Baltimore City YH2O program and has served the Chesapeake Region for years as an water industry operational efficiency consultant.

92. Thursday, August 31, 2023
Room 215
5:00 PM - 5:30 PM

Title: Evaluating Biological Efficiency: Collection Systems and WWTP Problems and Solutions

Presenter:
Howie Pearson
Biochemist, Quorym

Abstract:
The integrated network of cellular systems in the wastewater treatment process and collections system introduces massively complex problem solving in our wastewater infrastructure. The integrated nature of these systems requires daily problem solving, and many unanswered questions. Parameters in the wastewater infrastructure such as settleability, SVI, denitrification, nitrification, hydrogen sulfide production, filamentous issues, FOG, among many others, are all linked to cellular biology in wastewater systems. The aim of this instruction is to translate process control parameters in the wastewater treatment process and in the collection system to biochemical processes at a cellular level to troubleshoot complex biological problems. Beginning with a review of basic wastewater principals, the course will then translate these principals into cellular biology. The course will cover how bacteria grow, and the types of bacteria that grow under certain environmental conditions. The biochemical reactions that take place to conduct metabolism and growth. How each type of cell can remove various nutrients, and how they utilize various carbon sources. The importance of various process controls in the system, and how they impact bacteria cell, colonies, and bacteria flocs. The cellular processes that performed in the collection system, and how collection system maintenance is an important step of the wastewater treatment process. How collection system maintainers can utilize cellular biology concepts to solve maintenance inefficiencies and problems. By uncovering the microscopic and molecular interactions that take place, an operator or maintenance technician can find efficient solutions to problems, that save money, labor, all while improving flocculation and nutrient uptake in the wastewater treatment process.

Learning Objectives:
Review biological processes in wastewater distribution and treatment
Identify biological inefficiencies in wastewater distribution and treatment
Develop efficient biological strategies for system maintenance

Biography:
Name: Howie Pearson
Occupation: Biochemist
Organization: Quorym
Education: Undergraduate and graduate studies in Biochemistry and Polymer Chemistry, with a focus in biological polymers.
Experience: Creation and implementation of cell production for the purpose of inoculation within wastewater treatment systems for biological enhancement. Developed methods to the generation of high concentration cell growing methods, and operational methodology to grow, store, maintain, and distribute viable bacterial strains at a large scale. Conducted research on developing microbiology technologies in the wastewater science space.

93. Thursday, August 31, 2023
Room 217
8:30 AM - 9:00 AM

Title: Vacuum Sewer Systems 101

Presenter:
Jerry Gala
Americas Regional Manager, Airvac, Inc

Abstract:
This presentation covers vacuum systems used by municipalities and private land developers--describing how vacuum sewers work and how they overcome the perceived obstacles like topography, unstable soil, and high water tables. Is your project an ideal candidate for vacuum? We'll talk about the advantages of the technology, including potential cost savings over other technologies, and check out examples of advancements in vacuum sewer technology on today's state-of-the-art systems.

Learning Objectives:
To show how the use of vacuum technology can overcome installation and design challenges.
To discover which projects are ideal candidates for vacuum technology.
To understand the advancements and benefits of vacuum technology.

Biography:
Jerry Gala is the Americas Global Regional Manager for Airvac Vacuum Sewer Systems. Gala possesses a unique understanding of the mechanics of vacuum systems--including installation and maintenance parameters--and the importance of combining these elements for integrated project solutions. Previously, Gala worked in the packaging industry, optimizing performance for clients like Hillshire Farms and Sara Lee. Gala also spent time in the energy conservation space working with Federal and Public entities.

94. Thursday, August 31, 2023
Room 217
9:00 AM - 9:30 AM

Title: Under Pressure - Accelerated Design for Pressure Reducing Station

Presenter:
Chris Painter
Project Manager, HDR

Abstract:
A replacement for an existing pressure reducing station was designed following the hydraulic analysis of over 1,080 modeled flow and pressure conditions. At fifty year old, the existing HRSD Lucas Creek Pump Station (LCPS) is at the end of its design life and requires urgent replacement. The LCPS is located in Newport News, VA, at the junction of two force mains and the discharge of the local wastewater collection system. The station normally pumps collection system flow but can also receive flow from either or both force mains and act as a pressure reducing station for the upstream system. As part of an EPA Consent Decree, the existing LCPS must be replaced by the regulatory deadline of May 1, 2025. In order to meet the regulatory deadline, a new pump station needed to be designed on an expedited schedule to leave adequate time for construction. The new LCPS was designed to maintain the functionality of the original station while having improved protection from flood events and architectural features to blend the structure with the community surroundings. The design progressed from a blank sheet to bid documents in 12 months. To meet the dual functionality requirements, two 25 HP pumps and three 100 HP pumps were provided for collection system operation and pressure reducing operation respectively. The pumps were sized to provide continuous pump operation from a minimum collection system flow of 156 GPM to a peak pressure reducing flow of 5,884 GPM while maximizing operation within the Preferred Operating Region. Pump intake and operating parameters were designed following Hydraulic Institute guidelines. A majority of the project site was below the flood elevation and divided by a drainage swale that served as a collection point for stormwater from 51 acres of surrounding neighborhood. Mandatory setbacks from the roadway and the large station footprint pushed the structure to a low area, directly overtop the swale. Therefore, grade on site was raised and the drainage swale was replaced with a buried storm drain system. Four distinct architectural renderings for the LCPS façade were developed to obtain owner input in a collaborative design process. Architectural improvements including faux windows, porches and ornamental fence were provided to blend the structure into the neighborhood. Site constraints required the wet well to face the roadway so a false garage was provided to screen the wet well from public view. The pump station project bid advertisement was issued on February 22, 2022. The pump station is currently under construction with a final completion date of January 2025. Due to the timely delivery of the completed design, several months of float are available in the construction schedule prior to the EPA consent decree deadline of May 2025. This presentation will discuss the design approach to overcome the above described challenges while holding to a strict design schedule. Topics that will be covered include hydraulics, flood protection, architectural aesthetic, permitting challenges and designing around the dual functionality of a traditional wastewater pump station with pressure reducing capabilities.

Learning Objectives:
Discuss strategies for accelerating design phase of pump station/pressure reducing station project.
Highlight collaborative design approach for reducing project impact on community.
Review design "trip" hazards including permitting and compliance with local ordinances.

Biography:

Chris is a Project Manager with HDR and has 10 years experience in the design and construction of wastewater projects throughout the Mid-Atlantic Region. Chris has a B.S. in Engineering from Virginia Tech and is licensed as a PE in the Commonwealth of Virginia as well as certified as a Construction Document Technologist.

95. Thursday, August 31, 2023
Room 217
9:30 AM - 10:00 AM

Title: More Than Just Alarming: Modern Monitoring Solutions Help Utilities Optimize Assets with Data

Presenter:
Kevin Stock
CEO, Streametric

Abstract:
Most utilities in North America have a low staff headcount — typically 2-4 people maintain dozens of assets over a wide area. And yet, their duty is to run and maintain a key infrastructure that fuels their communities. This lack of human resources results in shortcomings that affect preventative maintenance and proactive planning. Municipalities fall short because they simply can't keep up with demands. The solution to these overwhelming problems is to adopt modern monitoring and predictive solutions. Progress has already begun in this area, mainly within large utilities with the ability to adapt easily due to size and funding. This presentation introduces state-of-the-art monitoring solutions that can be adopted by small utilities in a cost-effective manner. Utility leaders will learn about the capabilities of modern monitoring solutions; the value of data related to advanced analytics; the positive impact of AI; and preventive maintenance. Based on use cases and case studies, this presentation will give examples on the ease of implementation and cost effectiveness. We will cover key technologies including flow estimations, pump health monitoring, real-time data, and alarms. The presentation also provides a platform for an exchange between participants (utilities, engineers, manufacturers) to improve the understanding about existing challenges and opportunities. Currently, flow studies are projects that consume an immense number of resources and time. With more modern flow estimation (automated drawdown test), estimated flows can provide the utility accurate data without the cost of an expensive flow meter. This data can not only be essential for understanding pump performance and health, but it is also valuable for engineers to plan expansion projects. In summary, this presentation should empower utilities to install and enjoy advanced data collection technology, deploying a continuous monitoring solution without needing to walk through the plant to check on things, for example each pump. Finally, water utilities can enjoy an efficient, reliable, and safer process with enhanced capabilities.

Learning Objectives:
Introducing state of the art monitoring solutions
The value of data in regards to advanced analytics
The positive impact of preventive maintenance

Biography:
Kevin Stock has 30+ years of experience in the Water & Wastewater industry. His expertise is in SCADA (Supervisory Control and Data Acquisition), controls, and IoT technologies. In 2003, Kevin founded Scadata and developed a signature turnkey SCADA (SaaS) software. He is a leader in the Water/Wastewater emerging digital technology platform and holds a US Patent. Currently, Kevin is the CEO at STREAMETRIC, a MANN + HUMMEL company, helping Water and Wastewater professionals, internationally, achieve better systems performance through Artificial Data intelligence via digital technology platforms.

96. Thursday, August 31, 2023
Room 217
11:00 AM - 11:30 AM

Title: Modernizing CSO Management

Presenter:
Liie Hill PE
Engineering Manager, Jacobs

Abstract:
This presentation will describe the digital transformation of combined sewer overflow (CSO) monitoring in Wilmington, Delaware. Attendees will learn how the City of Wilmington is modernizing its CSO infrastructure by adding state-of-the-art level and flow monitoring at the CSOs and interceptors. Details will be shared on sensor selection, communications via a low-power wide area network, and key lessons learned from an interdisciplinary team of wet weather conveyance experts, electrical engineers, operational technology engineers, and wastewater treatment professionals to provides 24/7 monitoring capabilities, optimize staff utilization, and build a more intelligent integrated wastewater management system.

Learning Objectives:
Technology selection for remote CSO monitoring and communications
Working within an interdisciplinary team
Digital tools for CSO monitoring and management

Biography:
Liie is a civil engineer with over 15 years of experience including utility operations, permitting, resource planning, design, construction, and commissioning. She's working as an Engineering Manager with Jacobs in Wilmington Wastewater Treatment Plant in Delaware, focusing on capital improvement projects. Liie is registered professional engineer and water operator. Previously, Liie was a chapter president for the New Mexico chapter of AWWA and is currently residing in Philadelphia with her two dogs.

97. Thursday, August 31, 2023
Room 217
11:30 AM - 12:00 PM

Title: Sub-aqueous sewer crossing between residential neighborhoods

Presenter:
Brandon Reider Assoc. DBIA
Project Manager, Garney Construction

Abstract:
The Little Hunting Creek Gravity Sewer project replaces an existing system that conveys wastewater across Little Hunting Creek to an existing pump station in Alexandria, VA. This project was part of a larger upgrade of the collections system for Fairfax County. This presentation will focus on the challenges and the collaboration between the community, Fairfax County and Garney Construction that led to the success of the project. Due to the existing constraints of the project, this pipe was installed in the waterway via open cut methods and required divers to work with zero visibility. This 800' pipe crossing was done while managing tidal conditions and maintaining a strict project schedule to reduce impact on the waterway and achieve pipe installation within permitted time restrictions. Once the subaqueous crossing was completed there were additional challenges to make the on-land pipe connections based on poor soil conditions for pipe installation at depths exceeding 20' to occur while maintain access for residents and keeping access to community amenities.

Learning Objectives:
Underwater Utility Installation in Zero Visibility
Coordination with residential Communities
Deep excavations in poor soil conditions

Biography:
Brandon Reider, Assoc. DBIA, is a Project Manager at Garney Construction and has been working in the construction industry since 2010 on a variety of transportation, utility, and heavy civil projects. As a Project Manager for Garney Construction, Brandon's responsibilities include management of field operations, client engagement, and estimating.

98. Thursday, August 31, 2023
Room 217
12:00 PM - 12:30 PM

Title: Overcoming the Challenges of Pumping into a Long Force Main with Low Static Head

Presenter:
Steven Clark PE, BCEE
Project Manager, GHD

Abstract:
Sussex County is currently completing an upgrade and expansion of the South Coastal Regional Wastewater Facilities to 10 mgd capacity. The upgrade includes a new pumping station that pumps treated effluent into an existing effluent force main and ocean outfall that were constructed in the 1970's. The new effluent pumping station has a peak flow capacity of 22 MGD and consists of three 75HP vertical mixed flow pumps and two 300HP vertical turbine pumps. Construction of the new effluent pumping station is nearly complete with startup planned for the spring of 2023. Pumping applications of this nature are inherently challenging owing to the low and variable static head component of total dynamic head, in this case exacerbated by the existing force main being marginally undersized for the new design flow. During normal operations, the force main is only pressurized to a high point less than 100 feet from the pumps, resulting in a very low total dynamic head. During high tide and flow conditions, the force main can fill, and when full undergoes a transition to fully pressurized conditions. At this transition, total dynamic head increases significantly. Combination air and vacuum valves were selected such that the resultant pressure spikes associated with the new design flow would be no more than those modelled for the existing system and previous design flow. This presentation describes the distinctive elements of design, procurement, testing, and startup of this facility that may also be typical to other low static head pumping applications, including the assessment of the existing infrastructure, hydraulic design with a focus on the transition from gravity to pressurized force main conditions, pump selection and procurement, transient analysis and the associated force main upgrades to mitigate transient pressures, features included in design to allow for optimizing pump performance and exercising the large pumps, control strategies, emergency systems, strategies adopted during testing, and results from startup.

Learning Objectives:
Understanding the challenges of pumping into a long force main with low static head
Potential solutions for the stated challenges
Shared experience from startup of a complex pumping system

Biography:
Steven Clark is a licensed Professional Engineer who graduated with a Bachelor of Civil and Environmental Engineering from the University of Wollongong, Australia in 2004, and has worked with GHD for the 18 years since entirely focused on the planning, design, and construction of water and wastewater infrastructure. The first 9 years of Steven's career with GHD were spent in Sydney, Australia, and the most recent 9 years based in Maryland with projects primarily in Delaware, Maryland, and Virginia.

99. Thursday, August 31, 2023
Room 217
2:00 PM - 2:30 PM

Title: Stormwater Project Management Solutions

Presenter:
Olivia Devereux she/her
Sr. Watershed Strategist, Devereux Consulting, Inc.

Abstract:
Learn how to synchronize disparate systems including sediment and stormwater plan submital and approvals, field inspections, reporting, and communication. This single system approach makes information readily available for all staff through the life cycle of plan submittal to post-construction maintenance and reporting.

Learning Objectives:
How to centralize data management for stormwater construction and post construction plans and inspections
How to use map tools and automate letter and report generation
How to fully integrate inspections with desktop and mobile tools

Biography:
Olivia Devereux has expertise in developing management systems that enhance, maintain, protect, and improve land and water resources. Such systems track stormwater projects through the lifecycle of plan submittal, design, construction, fees, permits, inspections, post-construction maintenance, and reporting. She is an expert in developing linked watershed and BMP modeling systems.

100. Thursday, August 31, 2023
Room 217
2:30 PM - 3:00 PM

Title: A 21st Century Tool to Address 21st Century Flooding: Modeling the City of Baltimore's Stormwater System

Presenter:
Jeff Pelletier P.E., D.WRE, PMP
Senior Project Director, Atkins

Abstract:
The City of Baltimore (City) has embarked on an ambitious project to develop a best-in-class hydrologic and hydraulic (H&H) model of their stormwater system. The model will not only be used to assess the level of service of the storm drain network but will also be used to identify other root causes of surface flooding, including insufficient inlet capacity or high tailwater conditions at the outfalls. In addition, the City will use this model as tool to evaluate the impact of proposed development and redevelopment on the stormwater system. For this project, three pilot watersheds were selected by the City; Stony Run, the Lower Middle Branch of the Patapsco River and Gwynns Run. These watersheds are representative of the land uses, topography and flooding issues experienced within the City. A main objective of this project is to characterize the stormwater system and to develop and evaluate measures to mitigate flooding. The impact of climate change will also be considered in the modeling scenarios. Perhaps the most important objective of the project is to compile the best practices and lessons learned during the model development, validation and application in the pilot watersheds so that they can be applied during the effort to model the remainder of the City's stormwater system. These best practices and lessons learned will be documented in a H&H modeling handbook to promote efficiency and consistency during the development of the citywide models. To accurately represent the interaction between surface runoff, the storm drain system and the receiving waters, a coupled 1-dimensional, 2-dimensional (1D-2D) model configuration was needed. A software evaluation was conducted and InfoWorks ICM™ was selected. The 1D model network includes the storm drain system and the receiving streams. Data sources for the storm drain system included the stormwater GIS and record drawings. For the receiving streams, existing HEC-RAS models used for FEMA floodplain studies were obtained and imported to InfoWorks. Field surveys were conducted to fill gaps in areas where inferring or interpolating the missing data was not appropriate. To ensure the model's predictive accuracy, observed data from a variety of sources was used during the calibration and verification process. High-resolution gauge-adjusted radar rainfall (GARR) data was used in conjunction with temporary flow monitors deployed in the storm drain system. In addition, the City maintains a Flood Warning System that includes stream gauging stations. To identify areas subject to surface flooding, the City's 311 complaint was used, as were data from the Maryland MyCoast app. This project will chart the course for the City to develop a systemwide, high-quality decision support tool that will be used for years to come to plan projects that increase the resilience of the stormwater system to a changing climate.

Learning Objectives:
Define the process used to develop and validate a coupled 1D-2D model of the stormwater system
Learn how the model will be applied to characterize the system and identify root causes of flooding
Learn the types of flood mitigation measures planned

Biography:

Jeff Pelletier has over 30 years of water resources planning experience and is board-certified water resources engineer and a Project Management Professional. He serves as a Senior Project Director and Atkins' national Collection System Modeling and Planning Practice Leader.

101. Thursday, August 31, 2023
Room 217
3:00 PM - 3:30 PM

Title: Tips for Evaluating the Feasibility of Retrofitting Existing Stormwater Facilities

Presenter:
Shahjabin Alam
Civil Group Manager, Shahjabin Alam

Abstract:
Water quality was not a primary concern when much of our nation's stormwater infrastructure was built; the main purpose of these systems was to alleviate flooding. But, in recent years, federal regulation increasingly requires local governments to do more than control water quantity; they must also protect water quality by reducing pollutant loads in stormwater runoff. Communities must build new Best Management Practices (BMPs) that remove pollutants from runoff or retrofit existing facilities to include water quality volume. Retrofitting existing facilities can often be the most efficient method of reducing pollutant discharges, particularly in developed areas where land for BMP construction is scarce. These projects simultaneously extend the life and improve the performance of existing infrastructure investments, while adding new functionality to benefit the community. However, retrofitting existing facilities is not always feasible. Potential challenges include subsurface soil and groundwater conditions, the location of existing utilities, impacts to natural resources, neighboring land use conflicts, objections from adjacent property owners, and future maintenance costs. This presentation will look at the benefits and challenges of retrofitting existing stormwater facilities. The presenter will offer guidance on what communities should consider when evaluating the feasibility of retrofitting existing stormwater infrastructure. She'll also explore various criteria associated with proper design and construction of retrofit projects.

Learning Objectives:
How stormwater facility retrofitting can help achieve NPDES compliance
steps and considerations in the planning phase of stormwater facility retrofitting
cost-effective approaches to planning and design of stormwater facility retrofits

Biography:
Ms. Alam is the Civil Group Manager at the HRG King of Prussia office. She holds a bachelor's degree in civil engineering and a master's degree in environmental engineering. She has over 16 years of experience in water resources studies and design, stakeholder facilitation, program management, and project oversight throughout the Mid-Atlantic region. Her experience includes project management, NPDES and MS4 permit compliance, green stormwater infrastructure design, stormwater management facility design, stream restoration design, H&H modelling, watershed modeling, water quality analysis, E&S control design, and stormwater financing studies.

102. Thursday, August 31, 2023
Room 217
4:00 PM - 4:30 PM

Title: Leveraging Community Engagement, Technology and Engineering to Address Drainage Concerns in Gaithersburg

Presenter:
Mark Voli
Senior Project Manager, Dewberry

Abstract:
The City of Gaithersburg has received numerous reports of drainage issues from the public related to inadequately sized, aging, and failing stormwater infrastructure. Dewberry is providing support to the City of Gaithersburg to complete a watershed study within a 740-acre area that encompasses the headwaters of the Muddy Branch, Lower Seneca Creek, and Middle Seneca Creek watersheds. The study will identify, evaluate, and prioritize opportunities for improving neighborhood level stormwater management (SWM) and infrastructure to allow for greater climate resilience. The project commenced with the development and distribution of a community survey targeting residents and businesses within the study area. We collected feedback on drainage issues, flooding, and other stormwater concerns using an online MetroQuest survey. Community survey results were one of the primary parameters evaluated during a desktop analysis completed to prioritize specific locations for field assessments. Other parameters evaluated included drainage issues received by the City, inlet and SWM BMP inspection records, impervious cover, existing SWM BMP treatment, and stormwater infrastructure data gaps. Field assessments consisted of a visual evaluation of drainage areas delineated for 48 Points of Investigations (POIs) within the 740-acre study area. Drainage areas categorized as high priority received detailed investigations that included the verification and collection of drainage structure and pipe data that could be critical to the development of existing conditions H&H models, infrastructure condition ratings, and the identification of potential stormwater improvement projects. Windshield surveys were conducted to verify general drainage patterns, drainage structure locations, and drainage area boundaries in lower priority areas. All field data was collected in custom ArcGIS Field Map forms. Results of the field assessments are being used to prioritize approximately 6,000LF of pipe for CCTV inspections, which will assist with informing the prioritization of improvement project locations. Dewberry will model current conditions of prioritized areas to simulate the 10-year, 24-hour storm event for a generalized understanding of the hydraulics of the drainage system, to identify pinch points, and refine locations and future remediation strategies. Simulations will also be run for future conditions under climate change. A final list of reprioritized stormwater improvement opportunities will be generated after model development and concept designs will be completed for the top ten opportunities. Four community engagement events are incorporated into the study and include the initial community survey, one public meeting following the completion of field assessments, a second public meeting following the model development, and a final public meeting to present the results of the study. We developed and are continuously updating a publicly accessible ArcGIS StoryMap that explains the purpose of the study and provides updated results as the study progresses. This presentation will share our unique approach to evaluating neighborhood level drainage issues and identifying proposed solutions by engaging with stakeholders through community outreach efforts, leveraging the latest GIS technology, utilizing CCTV, and developing existing and future condition H&H models.

Learning Objectives:

Biography:

Mark is a Water Resources Senior Project Manager in Dewberry's Owings Mills office. He has 13 years of consulting experience with a focus on stormwater assessment and planning. His core responsibilities include assisting local governments with meeting NPDES MS4 permit requirements, performing watershed assessments to identify opportunities to improve the quality and quantity of stormwater runoff, and managing geospatial datasets associated with a variety of stormwater assets.

103. Thursday, August 31, 2023
Room 217
4:30 PM - 5:00 PM

Title: Combined Sewer Separation – Challenges & Lessons Learned

Presenter:
Stephanie Cuthbert
Principal, Water & Wastewater Division Manager, Remington & Vernick Engineers

Abstract:
Combined sewer communities are required to develop a Long-Term Control Plan (LTCP) that details specific controls to be constructed, a schedule for implementation, and a Post-Construction Compliance Monitoring (PCCM) Plan. The ultimate goal for the Combined Sewer communities and the LTCP is compliance with state water quality standards as well as the reduction of overflows and the control solid and floatable material during CSOs. A regional Authority that receives and treats the combined flows from several combined sewer municipalities saw the need to develop a LTCP on a regional basis. The systems work together and combined sewer issues could not be rectified without a regional approach. The result was a regional Combined Sewer Separation project. Combined sewer systems have established their respective Long Term Control Plans (LTCP) as well as well as the evaluation of alternatives to control combined sewer overflows. For three combined system Owners, the regional separation of their combined sewer systems is underway to resolve century old issues of capacity issues and overflows.

Learning Objectives:
This presentation will discuss the successful team approach employed to complete the separation project including multiple engineering firms working together, engagement of a local university to model The presentation will look at lessons learned from a technical and construction perspective as well as government collaboration effort.

Biography:
I am a firm Principal and serve as Department Head of RVE's Water and Wastewater Division. I have led our Division in acquiring more than $100 million in funding for clients to assist in the development of safe, reliable and sustainable water and sanitary systems. I graduated from Drexel University and have more than 29 years of experience in the water and wastewater industry. I am a licensed professional engineer with expertise in the evaluation of water and sewer infrastructure and the design and permitting of utility system improvements.

104. Thursday, August 31, 2023
Room 217
5:00 PM - 5:30 PM

Title: Introducing a New Standard Method for Measuring Trash Capture

Presenter:
Greg Williams PhD, PEng
Director of Water Quality Technology, StormTrap

Abstract:
This presentation will talk briefly about ASTM, then describe the new standard ASTM E3332 Determining Trash and/or Debris Capture Performance of Stormwater Control Measures in depth. The focus will be on how to interpret the results of all six tests in the standard.

Learning Objectives:
Attendees will learn how solution providers will use ASTM E3332 to assess the performance of trash capture devices/practices.
Attendees will learn how to interpret the the results of E3332 testing.

Biography:
Dr. Greg Williams, P.Eng., is the Director of Water Quality Technology for StormTrap. He has been involved in SCM product development, testing and verification for over a decade, including with with Good Harbour Laboratories, a stormwater treatment device testing lab. He has co-authored numerous papers, patents and technology verification reports. Dr. Williams is active on numerous stormwater related committees and organizations including the Stormwater Equipment Manufacturers Association (SWEMA) Board of Directors, the Water Environment Federation (WEF) Stormwater Institute Steering Committee, the Stormwater Testing and Evaluation of Products and Practices (STEPP) Leadership Group and the ASTM E64 Executive Subcommittee.

105. Friday, September 1, 2023
Room 201-202
9:00 AM - 9:30 AM

Title: Learning from experience: Emergency preparedness "Best Practices" to limit the impact of watermain failures

Presenter:
Susan Donnally
East Region Condition Assessment Lead, HDR

Abstract:
Providing customers with a reliable source of clean drinking water is the number one goal for any water utility provider. Failures of water transmission and distribution systems are disruptive to communities, cause environmental damage and put emergency services in jeopardy. As buried infrastructure in the U.S continues to age, many utilities struggle to keep up with scheduled replacements and repairs. Over the past 10-years, water main breaks in the U.S. increased nearly thirty percent, meaning that utility owners are spending more time responding to breaks now than ever before, limiting the resources needed to proactively replace the aging pipelines. To maximize the life of their existing infrastructure, proactive utility owners often implement programs to assess and renew pipes; however, failures are an inevitable consequence of aging infrastructure. While it may be impossible to eliminate pipe breaks, there are strategies that can be deployed to limit the impact when the inevitable happens. AWWA M19 (Emergency Planning for Water and Wastewater Utilities) provides utility owners guidance when it comes to being prepared for water main failures; however, many leading utilities in the U.S. have also developed and deployed their own emergency preparedness plans for when pipes break, that allow them to limit the impact to their customers. Each utility's unique solutions, while often born out of necessity, can offer other utility owners the ability to learn from their experiences and improve the reliability of water systems throughout the U.S. The cost of a water main break can be significant to a utility owner, both from a monetary standpoint, as well as a customer confidence standpoint. Having a plan in place to quickly respond in the event of a failure is imperative to reduce service outage time. The Washington Suburban Sanitary Commission (WSSC), who manages one of the largest water transmission systems in the U.S. has developed their own emergency preparedness plans, which allows them to quickly respond to water main breaks, limiting the impact to its customers. Additionally, the Water Research Foundation (WRF) 5069 study, completed in 2020-2021, included emergency preparedness plans from several other major utilities throughout the U.S., including the Great Lakes Water Authority (GLWA), San Diego County Water Authority (SDCWA), Tarrant Regional Water District (TRWD) and WaterOne, as well as several others. This paper will include a best practices approach for preparing for and responding to watermain failures. The goal of this paper will be to provide utility owners guidance on development of their own emergency preparedness plans, using the experience of WSSC, as well as several other major U.S. water providers.

Learning Objectives:
How to effectively develop an emergency preparedness plan for a water main break
To highlight industry best practices for limiting downtime due to pipeline outages

Biography:
Susan is the East Region Condition Assessment & Rehabilitation Business Class Lead for HDR's Water Business Group. During her 23 years in the water industry, she has focused solely on buried

infrastructure and has experience in the full lifecycle of pipelines, from managing design and construction projects to development and implementation of large-scale linear asset management programs. Her focus for the past decade has been pipeline condition assessment and renewal, specializing in large diameter pressure pipe management. She manages some of the largest pipeline assessment programs in the Country, working with utilities throughout the U.S. She holds a BS in Chemistry from Salisbury State University in MD, as well as a BS in Civil Engineering from the University of MD

106. Friday, September 1, 2023
Room 201-202
9:30 AM - 10:00 AM

Title: Water Distribution Intervention Without Service Disruption

Presenter:
Justin Prillaman
Territory Sales Manager, Hydra-Stop

Abstract:
Line Tapping, Line Stopping, and Valve Insertions are maintenance techniques done under pressure to reduce associated risks and provide a more productive method of maintaining and repairing distribution and collection systems without complete system shutdown. The information provided on this technology can prove to be invaluable when designing a new service or maintaining an existing one. Line Tapping is a means to gain access into a live pipe. Line stopping is temporary means of controlling flow in the pipe where no valve is present. Valve insertions utilize functions of both tapping and line stopping and are performed to provide a permanent means of control. These processes are very efficient, allowing the utility or contractor to make the repairs, or additions without disruption of services. The benefits of Line Tapping, Line Stopping and Valve Insertion include: Uninterrupted hydrant and valve replacement; No loss of treated water; Elimination of cross contamination; Elimination of boil orders; Safer working conditions for the operator; and increased water conservation with no discharge or water loss. The proper application of these techniques and other benefits will be discussed in this presentation.

Learning Objectives:
Know and understand line tapping, line stopping, and valve insertion uses, applications, and limitations.
Gain an understanding of the benefits that these technologies provide.
Provide knowledge of this technology and which application to use when designing a new service or maintaining an existing one.

Biography:
Justin Prillaman joined the Hydra-Stop team in November 2022, and is currently working as a Regional Territory Manager for Hydra-Stop. He has 20+ years of experience working in the Water Works industry and serving municipalities, private water companies, contractors, engineering firms, and trade organizations throughout Mid-Atlantic Region. He holds a B.S. of Biology degree from Radford University and enjoys spending time with his daughter Lyndsay, and his Brittany Spaniel, Blaze. In his spare time he enjoys an active outdoors lifestyle including camping and boating at Smith Mountain Lake during the summer. He also enjoys playing occasional gigs with his band or as a solo act at local venues on the weekends.

Justin Prillaman | Hydra-Stop Territory Sales Manager
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107. Friday, September 1, 2023
Room 201-202
10:15 AM - 10:45 AM

Title: Glenridge 66-Inch Water Main Relocation -Benefits of Early Contractor Inclusion in Design and Pre-Construction

Presenter:
Cristian Arevalo
Senior Project Manager, Garney Companies, Inc.

Abstract:
The Glenridge 66-Inch Water Main Relocation consisted of installing 3,229 linear feet of steel water main via open cut and trenchless methods as utility component of a larger transit system project. The project was to be completed within a 23-foot-wide median of a major Maryland four-lane thoroughfare. The project owner and design engineer carried out the decision to involve the contractor between the 70% and 90% milestones of project design progression. The project benefited from the early contractor inclusion in the forms of enhancing preconstruction activities; allowing for the completion of time-of-year restricted tasks prior to constraints; concurrent design progression and material procurement despite delayed supply chain conditions; timely maintenance of traffic plan modifications; and early identification of risk. The advanced collaboration resulted in elevated levels of cost certainty, accelerated resolution of unforeseen issues, and limited variance from the initial critical path schedule.

Learning Objectives:
Benefits of contractor inclusion during the design and planning of a project
Benefits of close collaboration between a contractor, engineer, and the owner(s)

Biography:
Cristian Arevalo is a Senior Project Manager with extensive experience in the water and wastewater industry. As a key member of the Mid-Atlantic Pipe Division at Garney Construction since July 2017, Cristian brings a deep understanding of managing projects of varying scales, stakeholder management, risk assessment, proactive problem solving, and budget control. Cristian has performed work with municipal, private, and federal clients throughout Maryland, Virginia, and the DC Metro Area.

108. Friday, September 1, 2023
Room 201-202
10:45 AM - 11:15 AM

Title: Leveraging Configurable Software Solutions to Support Vertical Asset Management

Presenter:
Natalie Ciletti GISP
GIS Manager, AECOM

Abstract:
With an increasing emphasis being placed on the inventory, condition assessment and management of vertical assets for water and wastewater facilities, this presentation will showcase options for developing, enhancing and managing a GIS-based asset inventory. This session will cover best practices and case studies in integrating widely accessible commercial-off-the-shelf (COTS) GIS applications with existing asset management software and Computerized Maintenance Management Systems (CMMS), with a focus on mobile applications within the Esri suite of software, including Field Maps and Survey123. This presentation will discuss best practices for data integration of within an existing asset hierarchy, both spatially and non-spatially, and how to determine the most effective means of collecting data across various disciplines. A common issue in the industry is in the lack of an existing GIS inventory for vertical assets. We will offer a vision into addressing this by providing an outline of the basic requirements of databases/data models designed to house an optimal GIS-based digital inventory for vertical asset management. In building a comprehensive asset inventory, facilities can work closer to having real-time insights into the operation and maintenance of their integrated systems via dashboards and web mapping applications. This presentation will discuss the specific tools, technologies and workflows that have been used to streamline data collection, validation and management practices, and will discuss best practices and lessons learned for utilities who are looking to apply asset management principles for their water/wastewater facilities.

Learning Objectives:
To understand the GIS technologies available to improve vertical asset management workflows.
To provide case-uses for a GIS-integrated approach to managing vertical assets.
To outline best practices in designing a GIS integrated asset management system.

Biography:
Natalie joined the industry in 2012 while pursuing her B.S. in Environmental Science at Towson University. As a GIS Professional, she leads a team of GIS Specialists under the water business line at AECOM, and enjoys collaborating on a wide variety of civil design and asset management projects. Making GIS technologies such as web mapping applications more accessible to all audiences is a passion of hers, as is adventuring in the great outdoors!

109. Friday, September 1, 2023
Room 201-202
11:15 AM - 11:45 AM

Title: Asset Management Programs to Address the Labor Shortage

Presenter:
Timothy Taber PE
Vice President, Barton & Loguidice, DPC

Abstract:
Infrastructure systems provide essential services to our citizens daily— such as the water and sanitation facilities they use to stay healthy. Effective asset management has become as critical as ever across the globe in the face of mounting pressures, such as limited resources, growing urban populations, shifting patterns of employment and land use, climate-related disruptions, and health emergencies, including the COVID-19 pandemic. Asset management is also useful in addressing the urgent need to develop a qualified workforce to maintain infrastructure investments. Asset management is managing infrastructure capital assets to minimize the cost of owning and operating them while delivering the service level customers desire. The water sector has widely adopted this management framework to pursue and achieve sustainable infrastructure. A water or wastewater utility can only function with properly trained staff. It is critical to have certified and qualified staff who will fulfill the municipality's commitment to its customers, regulators, and visitors to the community. A good asset management plan should incorporate a staffing plan and an organizational chart that encourages communication and coordination across a municipality. It also ensures a municipality has an adequate number of knowledgeable staff to support the responsibilities of the operations. Specific components of the asset management program may be developed, implemented, or enforced by different departments or individuals within the municipal structure. The staffing plan should describe how the information will be communicated and coordinated among all responsible parties. A good asset management program also becomes a utility's best knowledge retention tool. Knowledge retention and succession planning are key aspects of a sustainable asset management program. This is especially important for municipalities with few staff who are responsible for operations and maintenance. A knowledge retention or succession plan recognizes critical staff and expertise and identifies methods to keep this expertise. Institutional knowledge should be documented so critical future staff are not starting with limited information and knowledge about the utility. Having well-documented information on assets, historical activities on assets, operation and maintenance procedures, and criticality assessments (all critical elements of an asset management plan) are also invaluable in training new staff and job satisfaction for existing employees. This presentation will summarize how a good asset management program also includes human assets and can be used as an essential knowledge retention tool for a utility that improves training, succession planning, and job satisfaction.

Learning Objectives:
Importance of Staffing Plans in Asset Management
How Asset Management can be a knowledge retention tool for a utility
How Asset Management is a key tool for succession planning

Biography:
Mr. Taber is the Asset Management Discipline leader for Barton & Loguidice and has extensive experience in the planning, design, and construction of infrastructure and asset management projects.

He has been involved in civil engineering projects, and now focuses on planning, developing, and implementing GIS and asset management programs and working with organizations to improve their operations and management of their assets.
He has 27 years of experience in the water and wastewater industry and has over 25 years of dedicated experience in asset management.

110. Friday, September 1, 2023
Room 203-204
9:00 AM - 9:30 AM

Title: Local Utilities Answering the Call in Mississippi

Presenter:
Jay Price, WSSC Water *(retired)*
Eddie Cope, Anne Arundel County DPW

Abstract:
Flooding from August 24-27, 2022 in Mississippi had such a dramatic effect on the water system for the state capital, Jackson, that a boil water alert and low pressures became a reality. On September 5, 2022, the State of Mississippi issued an Emergency Management Assistance Compact (EMAC), requesting assistance from all 50 states to address the emergency water crisis in Jackson, Mississippi. Teams from Washington Suburban Sanitary Commision (WSSC Water) and Anne Arundel County DPW answered the call and began deployment on September 10, 2022 to Jackson, MS to help bring the water system (quality and quantity) back into compliance with the SDWA. An overview of the situation(s) that led to the water crises will be discussed and the hard work in extreme conditions by the two utilities will be highlighted; examples include helping to eliminate a boil water alert for the entire system and increasing capacity of the O.B. Curtis WTP from less than 8 MGD to approximately 50 MGD.

Learning Objectives:
How a utility responds to a mutual aid request for help.
Identifying and resolving operational issues.
Dealing with environmental conditions to complete the mission.

Biography:
Jay Price officially retired yesterday from WSSC Water. Jay has served the water/wastewater industry at WSSC Water and Baltimore City DPW for a combined 41 years, holding numerous positions ranging from Maintenance Worker to Deputy General Manager. Jay is the CSAWWA liaison and previously was a member of the Maryland Board of Waterworks & Waste Systems Operators. In September 2022, Jay was part of the first volunteer team to Jackson, Mississippi in response to a water emergency. Eddie Cope holds the position of Program Manager for Anne Arundel County Water Operations and has been in the water/wastewater industry for 38 years. In September 2022, Eddie was part of the second volunteer team to Jackson, Mississippi. Since 1994, Eddie has been an instructor for the WWO Short Course, Anne Arundel County, DelTech and MCET. Jay and Eddie enjoy connecting with operators of all levels, sharing their knowledge and experience, and helping to expand interest and dedication to water in all forms. Jay and Eddie are licensed Superintendents and Operators in Maryland and have been presenting classes together for the last 23 years.

111. Friday, September 1, 2023
Room 203-204
9:30 AM - 10:00 AM

Title: Managing Transmission Mains Through Various Data and Inspections Can Be Daunting – Here's A Way for Baltimore To Do It

Presenter:
Karl San Luis
Technical Services and Delivery, Suez Smart and Environmental Solutions, N.A.

Abstract:
This presentation will summarize a framework in creating an optimum, system-wide inspection plan given the probability and consequence in the network with the City of Baltimore as a case study. The framework presented applies for both water and wastewater networks, and is agnostic to any inspection technologies in the market. Managing transmission mains becomes a challenge as utilities and operators deal with aging infrastructure. The methodology enables utilities maximize the benefits of an inspection plan therefore maximizing the return on investment. The overall transmission management approach gives the City of Baltimore a robust and defensible program to managing transmission mains through optimal selection of inspections and having the ability to refresh the analysis with new condition data from these inspections.

Learning Objectives:
Participants in this session will learn an innovative methodology to efficiently manage critical pipelines in the system through a quantitative approach
Participants in this session will learn on how to set transmission mains budget in a analytically defensible manner
Participants in this session will learn on navigating various technologies in the market at various price points and precision levels

Biography:
Karl San Luis works under Technical Services and Delivery within SUEZ's Smart Environmental Solutions (SES) Division. He focuses on water sector asset and revenue performance solutions in North America (NA). Mr. San Luis holds a Masters of Science degree in Applied and Computational Mathematics from Johns Hopkins University and a Certified Analytics Professional (certified by INFORMS) since 2018. Over the years, Mr. San Luis has brought a statistical and probabilistic approach in tackling water and wastewater asset performance, bringing in layers of data such as condition assessment, hydraulic modelling and failure data.

112. Friday, September 1, 2023
Room 203-204
10:15 AM - 10:45 AM

Title: SIMPLE IMPROVEMENTS TO SCADA GRAPHICS CAN HAVE A BIG IMPACT

Presenter:
Dean Foote PE, RCDD
Electrical and I&C Manager, RK&K

Abstract:
SCADA graphics have traditionally been developed to mimic piping drawings with a sprinkling of analog data and equipment statuses. New graphic standards, such as High-Performance HMI, have emerged, but they are typically not well understood or implemented. They can also be costly to implement. Through a series of case studies, this presentation will show how small changes can have a big impact. The session will start with some basic concepts, then review some “before and after” graphics to illustrate the concepts and benefits.

Learning Objectives:
Attendees will learn how simple changes to HMI graphics can improve an operator’s response to process deviations, equipment failures, and alarms, resulting in improved situational awareness.
Learn how these changes can reduce new operator's learning curve.
Learn where to get additional information.

Biography:
Dean Foote, PE, RCDD brings more than 30 years of experience in the design, configuration, and commissioning of SCADA systems for water and wastewater utilities throughout North America. He is a Control System Professional Engineer (PE), with a masters degree in management information systems (MIS). He has presented numerous papers on automation and optimization, cybersecurity, and asset management. He also holds a patent for automation of vertical transportation systems.

113. Friday, September 1, 2023
Room 203-204
10:45 AM - 11:15 AM

Title: Clarifier Down… I Repeat, Clarifier Down…A Teams' Approach to Save a Plant's Operation

Presenter:
Anna Kazasi
Sr. Project Engineer, VA/MD American Water

Abstract:
Raw wastewater is being preliminary treated at a medium-sized wastewater treatment plant in Virginia before flowing to four sequencing batch reactors (SBRs), where biological treatment is achieved to reduce carbon, suspended solids, nitrogen, and phosphorus. Upon exiting the SBRs the secondary effluent flows through an aerated surge pond to three chemical clarifiers for additional phosphorus and solids removal. The clarified effluent flows to three tertiary disk filters and though ultraviolet radiation it is finally discharged to a nearby creek. Two of the three clarifier tanks have been in service since 1970. In 2018 one of the clarifiers experienced a failure of the top clarifier cone section assembly due to corrosion. This placed the unit out of service for almost nine months requiring the plant to rely on the other two clarifiers. While the unit was down for repairs, inspection of the tank showed evidence of deterioration of both the internal rake assembly and the upper sections of the tank walls. Both tanks were inspected again in 2021. The inspector found rust, tuberculation, and pitting throughout the interior tank walls, and on mechanical equipment, appurtenances, and sample piping. They also noted multiple instances of exterior paint deterioration, coating failures, and staining from previous leaks. Each chemical clarifier was determined to be in poor condition, and was recommended for replacement in lieu of rehabilitation, based on engineering assessment. The owner hired a consultant to define the anticipated design and construction elements associated with the clarifiers' replacement and selected the Construction Manager at Risk (CMAR) delivery method to complete the project. The presentation discusses the challenges the team faced during design and construction and how they managed to complete the project on time and within budget. Examples of these challenges include the ever-rising construction costs and long-lead times, which were in part mitigated by CMAR contracting, unknown condition of the existing clarifiers foundation and the embedded channel, the decision to investigate reusing the existing foundations to reduce cost and construction duration, the construction in a compact site, avoidance of plant shutdowns, and maintaining compliance with the regulatory effluent limits while relying on two clarifiers.

Learning Objectives:
Demonstrate the benefit of the Construction Manager at Risk (CMAR) contracting to expedite the contracting process and construction.
Discuss the design, construction, and maintenance of plant operations (MOPO) challenges during the replacement of two tertiary chemical clarifiers.

Biography:
Anna Kazasi is a Chemical Engineer with a master's degree in Environmental Protection and Sustainable Development from Aristotle University in Greece and a master's degree in Environmental Engineering from Virginia Tech. She is a registered PE in Maryland, an Envision Sustainability Professional, and a Construction Document Technologist. She is a Senior Project Engineer with Virginia American Water, responsible for the management and technical support on Capital Improvement Projects.

114. Friday, September 1, 2023
Room 203-204
11:15 AM - 11:45 AM

Title: Using Root Cause Analysis to Inform Rehabilitation

Presenter:
Andrew Fuller
Corrosion Practice Technical Lead, Black & Veatch

Abstract:
When assessing the condition of an asset the focus is always on the issues. In a facility walk-through, it is important to be able to discern what is significant vs. superficial. More in-depth studies can use destructive and non-destructive testing to define the root cause of failure. Identifying the cause of a significant issue is often critical to making sure a rehabilitation will perform adequately. This presentation focuses on how facility inspections can be enhanced by considering root cause analysis, the industry standards most relevant to executing in-depth studies, and the importance of designing rehabilitation with root cause in mind. At least three specific case studies from pump stations and treatment plants will be referenced.

Learning Objectives:
Understand the advantages of determining what led to an issue before designing a rehabilitation
Be able to describe industry standard root cause analysis approach
Describe techniques for enhancing visual inspection of a facility based on common concerns

Biography:
Andrew is a registered PE and certified Cathodic Protection Specialist with Black & Veatch. As the corrosion practice technical lead he focuses on producing high quality corrosion evaluation and mitigation products. His team's primary responsibilities are: cathodic protection, protective coatings and linings, corrosion modeling, integrity testing, root cause analysis, and rehabilitation.

115. Friday, September 1, 2023
Room 207-208
9:00 AM - 9:30 AM

Title: Styrene? Not in my ambient air! A DC Water case study for air quality monitoring and testing during CIPP installation at Soapstone Valley Park

Presenter:
Burak Kaynak
Project Manager, DC Water

Abstract:
The District of Columbia Water and Sewer Authority (DC Water) is repairing 6,200 linear feet of clay sewers constructed more than a century ago. The project is in Soapstone Valley, part of Rock Creek Park. The sewer system will be rehabilitated using hot water curing and a styrene-free resin. In July of 2021, DC Water proactively issued a Supplementary Standard Specification for CIPP adding requirements for air emissions. In June of 2022, during the construction phase, local elected officials passed a resolution urging the Department of Energy and Environment (DOEE) to require DC Water to obtain an Air Quality Permit for the CIPP work. DOEE required DC Water to submit an Air Quality Monitoring and Testing Plan (AQMP). A third-party contractor via the Water Research Foundation (WRF) will implement the Air Quality Monitoring Plan during CIPP installation. This study addresses worker safety, community safety, and the potential for air emissions during CIPP. According to the Safety Data Sheets (SDS), the resin material contains no Volatile Organic Compounds (VOCs). However, based on the review of the activator SDS, cumene and acetophenone are anticipated. Baseline samples will be collected. The research team will document the field conditions during air monitoring – daily activities, site maps, corrective actions taken, and unusual field situations which may impact samples or sampling. An Action Level Response Plan was prepared, including clear protocols in the event concentrations in the ambient air or lateral sewers exceed acceptable levels. Daily results will be reported to DOEE and shared with the community. The final report of air quality monitoring will be used to inform future construction approaches and data gathering efforts. Eventually, the project will generate data for DOEE to evaluate the effectiveness of monitoring and mitigation measures in the District. With the implementation of the AQMP, DC Water hopes to ensure the Project is carried out in accordance with best practices aimed at mitigating environmental risks. Ultimately, the results of the study will provide broad value to utilities across the USA. This paper and presentation will focus on the regulatory framework that led to the AQMP and the air quality results.

Learning Objectives:
Requirements for Air Quality Monitoring and Testing Plan for CIPP in D.C.
How to prepare an Air Quality Monitoring and Testing Plan for CIPP
Worker safety, community safety, and the potential for air emissions during CIPP

Biography:
Burak Kaynak is a Licensed Civil Engineer and Project Management Professional and has a master's degree in Civil Engineering and over 10 years of engineering experience across the water and sewer industry. He has managed numerous projects from planning to design, as well as bidding and construction. Projects include water piping design, sewer rehabilitation, water pipe replacement, and stormwater hydrology.

William Elledge is the Director of Engineering and Technical Services at DC Water. William's career has focused on water and sewer pipelines since 1998 with responsibility for delivering projects up to 180-miles long, 22 feet in diameter, and 2000 cfs. He has delivered projects in eight states (including the District of Columbia), three countries, and two Native American Nations. At DC Water, he is responsible for design of all projects in the linear water and sewer capital program. His staff of about 40 includes surveyors, AutoCAD technicians, engineers, project managers, and GIS technicians. Combined the team is currently responsible about 80 projects with a 10-year capital cost of $700 million.

116. Friday, September 1, 2023
Room 207-208
9:30 AM - 10:00 AM

Title: Dynamic Water Systems - How Water and Wastewater Agencies are Applying Digital Transformation Strategies

Presenter:
Shawn Dent PE
Vice President/Digital Water Technical Lead, Carollo Engineers

Abstract:
Digital Water Systems (DWS) are transforming all sectors across water and wastewater utilities. Faced with aging infrastructure, budget constraints, retirements, stricter regulations, and a growing amount of data – management, engineering, operations, and maintenance are seeing the need to better manage data and applications. This starts with the integration of systems to remove information silos, and scale solutions using actionable information to make informed decisions. The concept of DWS – also known as Intelligent or Smart Water - is gaining momentum because of the ability better leverage information to help owners make informed business decisions, and thereby reduce CAPEX and OPEX, increase operational efficiencies, extend asset life, reduce risks, and better inform and serve customers. This presentation will discuss a DWS framework that utilizes an open data structure to provide non-proprietary solutions for water and wastewater agencies across the U.S. and specifically in Texas. Enterprise database management techniques as well as example dynamic dashboards will be illustrated for the San Jacinto River Authority (SJRA). These applications will include several dashboards being used by SJRA for asset management, capital improvement planning, and operational systems and regulatory reporting. The asset management dashboard is currently helping SJRA manage over 7,000 assets and characterizing each asset by Consequence of Failure (COF), Likelihood of Failure (LOF), and Business Risk Exposure (BRE). The capital planning dashboard is helping SJRA manage the details of hundreds of capital projects as well as major projects needed for rehabilitation and replacement. The operational systems dashboard is incorporating laboratory data, SCADA flow data, and rainfall into a single dashboard to track daily operations as well as provide a mechanism for completing detailed regulatory reports. The three examples are directly applicable to any municipality that needs to eliminate data silos and use combined information to make data-driven decisions.

Learning Objectives:
How to apply digital water systems to manage data and information within limited budget
Understand how to provide non-proprietary digital water solutions for water and wastewater agencies
Learn how data dashboards can link data and analyses from multiple sources to provide information to operations and management staff.

Biography:
Shawn is the Digital Water Group Technology Lead for Carollo Engineers. He is a Vice President and over the past 32 years, Shawn has worked with clients, both nationally and internationally, to leverage their enterprise data and various software tools to develop innovative integrated solutions. He works across the breath of the industry in water, wastewater, recycled water, and stormwater. He is a national expert in planning for water resources and published multiple papers and a WEF book chapter integrating engineering with cutting edge water improvement solutions.

117. Friday, September 1, 2023
Room 207-208
10:15 AM - 10:45 AM

Title: Climate Adaptation and Preparing for Long-term Resilience

Presenter:
Kevin Smith PE
Project Manager, Ramboll

Abstract:
Once limited to hardscape infrastructure, resiliency projects are moving rapidly toward green infrastructure, as it is often more cost effective and considers whole community solutions. These projects have many benefits in addition to providing resilience, such as improving water quality, enhancing public greenspace, and increasing natural habitats for various wildlife. Green Scenario is a software-based, decision-support tool for easily evaluating and optimizing blue-green infrastructure design solutions. The tool enables stakeholders to rapidly see and understand the effects of their decisions via an iterative evaluation and assessment framework. The Living Breakwaters project in Staten Island is a green infrastructure coastal resiliency project that reduces risk associated with climate change and sea level rise by attenuating wave energy, shoreline restoration and erosion reduction, social resiliency, and ecological enhancement via constructed oyster reefs and tide pools. Staten Island was decimated by the storm surge from Superstorm Sandy, resulting in significant loss of life and property. Living Breakwaters won HUD's Rebuild by Design competition and is being implemented via a Community Development Block Grant and NYS funding. The project's construction management team assisted with the review and completion of contract documents, procurement services, pre-construction services, and is now providing management services during construction. Inspection services are being provided across several sites throughout NYS and NJ, including the project site in Staten Island. Coordination between the various subcontractors across the different sites has been key, as has coordination with the Owner and design team.

Learning Objectives:

Biography:
Kevin Smith has over 10 years of experience in water and wastewater utility and environmental engineering, as well as in construction management. He has been responsible for the design and project and construction management of sanitary and storm sewer pumping stations, water storage facilities, water and wastewater treatment plant upgrades, wastewater collection and conveyance systems, water distribution systems, and climate adaptation and resiliency projects for local and state governments and industrial clients in the Mid-Atlantic and Northeast US.
Sophia Ertel works in an engineering and planning capacity on climate resiliency master planning, blue-green infrastructure design and integrated water management programs. Her background in Civil Engineering lends to modeling, mapping and drafting design work in climate adaption projects. At the same time, Sophia leads stakeholder engagement efforts on planning projects by translating technical information for public use, ensuring protective measures for socially vulnerable populations, and garnering community engagement for project success. Her current project portfolio is diverse and ranges from neighborhood-level planning for flood mitigation in New York City and Washington DC to international collaboration on AI visualization tools for livable cities.

Paul Romano has professional civil and environmental engineering experience for various municipalities, state, and federal agencies, and economic development corporations. He has been responsible for numerous water resource and municipal infrastructure projects, including inflow and infiltration sewer studies, sewer system upgrades and overflow controls, green infrastructure and stormwater retrofits, flood resiliency, watershed, and water quality studies, environmental permitting and compliance, and asset data collection, assessment, and management. He has also provided capital project and master planning assistance to municipalities, including the development and implementation of funding strategies, preparation of grant applications, and grant administration.

118. Friday, September 1, 2023
Room 207-208
10:45 AM - 11:15 AM

Title: Using GIS to identify, track, and report on lead service line data to meet EPA requirements

Presenter:
Joe Deluca
Sr. Project Manager, EBA Engineering Inc

Abstract:
Municipalities and water authorities of all sizes face a myriad of challenges to achieve compliance with new EPA lead service line identification and reporting requirements by October 2024. Associated activities include having sufficient resources to identify and integrating existing lead service line datasets, collect lead service line data through public engagement and field work, monitor and track progress towards compliance, and generating reports to share findings and required datasets with the EPA. This presentation highlights how GIS can facilitate these efforts through process automation and implementation of best practices. Discussion topics include tools, tips, and processes to track progress; public-facing applications and workflow processes to capture service line data; and automated processes to notify customers with lead or unknown services lines and to streamline creation of EPA data submittals.

Learning Objectives:
Tips to identify lead service lines
Tips to track lead service line progress
Tips to automate the EPA data submittal process

Biography:
Joe DeLuca, GISP is a Sr. Project Manager for EBA Engineering, Inc., and is based in York, PA. Since graduating from the University of Maryland Baltimore County, Mr. DeLuca has worked in the mid-Atlantic area on GIS and asset management projects with a focus on water and wastewater assets.

119. Friday, September 1, 2023
Room 207-208
11:15 AM - 11:45 AM

Title: Leveraging Data Integration to Unlock Utility Growth

Presenter:
Kevin Flis
Client Solutions Manager, Xylem

Abstract:
Introduction Belforest Water System is a utility that provides water service to 5,000 customers in Alabama. They have been experiencing significant growth and anticipate this growth to continue to double their size in 5 years. To manage this growth Belforest invested in SCADA, smart metering, GIS, and CMMS, but this created operational challenges with each solution requiring a separate interface and effectively dispersing their data. As with most utilities, Belforest was experiencing a staff shortage and needed to find a way to work smarter, not harder and felt the solution lie with the untapped potential of their data. Methodology Belforest decided that the best approach would be to build a uniform smart water platform that could bring all their data and assets together. This way they can develop dashboards to visual the information they already have at their fingertips. From there they have built data analytics to begin extracting insights to enable them to work smarter. The steps involved included: 1. Core data integration of all disperse sources & systems. 2. Automated dashboarding and analytics of key operational indicators. 3. Predictive analytics to optimize pumping and network operation to minimize energy and non-revenue water. 4. Integration of real-time hydraulic modeling to generate a simulator and digital twin capabilities. Phases 1 and 2 of the uniform smart water platform were completed in 2.5 months to complete the data and operational integration. Phases 3 and 4 were completed in additional 2 weeks to generate the dashboards configured to Belforest's needs. Results Belforest was able to obtain a single repository of all assets in the utility and generate alerts from across all of their real-time data for the first time. In addition, they were able to automate non-revenue water reporting to AWWA standards and identify sources of water loss, identify anomalies in meter behavior, and simulate how many hours left of water during emergency conditions. With all these capabilities Belforest is now better prepared to increase their customer base because they can now estimate what consumption each parcel may have and then use this information to integrate them into their network easily. This will ensure their growth is sustainable and have full control over their water production and distribution along the way.

Learning Objectives:
The audience will learn how leveraging digital solutions to integrate traditionally silo-ed data sources (i.e. SCADA, GIS, CMMS, etc…) improves a utility's operational efficiency.
The audience will learn how leveraging digital solutions to integrate traditionally silo-ed data sources positions them effectively for growing their customer base in the future.
A case study from the Belforest Water System will be shared and show that digital transformation is scalable from large to small utilities as well.

Biography:
Kevin Flis is a Client Solutions Manager for Xylem who partners with utilities to provide software solutions and data analytics to solve the big water challenges such as aging infrastructure, regulatory compliance, and infiltration and inflow. Kevin was destined to be in the water industry. From his humble beginnings splashing around on the banks of the St. Croix River to growing up in a town called Lake Elmo

to graduating from Stillwater High School it should have been clear that the waves of progress were pushing him towards a career in the water industry. Outside of work Kevin likes to go paddleboarding with his family.

120. Friday, September 1, 2023
Room 215
9:00 AM - 10:00 AM

Title: Ethics Regulations and Cases in Engineering

Presenter:
Sam Grant
, Whitman, Requardt and Associates, LLP

Abstract:

Learning Objectives:

Biography:
Sam Grant is a technical specialist at Whitman Requardt in Baltimore MD. He has 45 years of experience as a professional Engineer and 41 years as a practicing attorney in Maryland. He got his Bachelors in Engineering at Duke University and his Masters in Environmental Health Engineering from Northwestern University. He also received is JD in Law from the University of Baltimore.

121. Friday, September 1, 2023
Room 215
10:15 AM - 10:45 AM

Title: Adaptive mixing and process optimization with energy savings

Presenter:
Colin Christie
Mixing Solutions Territory Manager, Xylem, Inc.

Abstract:
In the past, mixers have been given little consideration in the grand design of wastewater facilities. Mixers were designed for worst case scenarios, whether flow or loading, and did not provide flexibility to meet changing mixing demands. With an increased focus on energy management and treatment optimization, mixers present an opportunity for both. Many engineers and operators have come to recognize that overmixing not only wastes energy, but provides sub-optimal treatment process results. Flygt has been conducting a number of adaptive mixing pilot projects around North America. The purpose of the pilot studies was to determine the actual energy needed to provide mixing and the amount of energy savings that can be seen when mixers are “turned down”. In addition to the studies, the basics on mixing will be presented. We will discuss mixing applications, the measurement and importance of thrust, and the energy requirements for mixing.

Learning Objectives:
Mixing Applications
Importance of thrust and mixer location
Energy Savings

Biography:
Colin Christie is a Geological Engineer with Xylem’s Flygt Mixer Group. His focus is primarily Mechanical Mixers & Mixer systems in WWTP applications, Colin has over 20 year's experience in the wastewater industry.

122. Friday, September 1, 2023
Room 215
10:45 AM - 11:15 AM

Title: RNG: Maximizing the Value of Biogas

Presenters:
John Willis, VP, Fellow, Brown and Caldwell
Rob Taylor, Energy Manager, WSSC Water

Abstract:
As part of WSSC's BioEnergy Program (that will add Class-A Cambi anaerobic digestion to the Piscataway WRRF for treating sludge produced at their 5 WRRFs), produced digester gas will be upgraded to renewable natural gas. While some utilities consider RNG projection as non-core business and therefore outsource or "public-private-partnership" the subcontracting, operation, and maintenance of these activities; WSSC is contracting, negotiating, and managing the entire RNG/RINs program in-house. In doing so, current estimates have WSSC generating $2.5M/yr in net revenue (at already-negotiated rate structures and/or today's market prices; including D3-RINs @2.25/EGE and HenryHub NGas @$3.75/MMBtu). Through their internal management, WSSC could still realize net returns ranging from $0.3M/yr (when D3-RINs were at historic lows of $1.00/EGE) to $4.4M/yr or more (@$3.00/EGE for D3-RINs); the upside to WSSC's returns is enormous when compared to likely-when-outsourced returns of less than $0.3M/yr or even negative (based on results elsewhere). This presentation will provide overviews of Contracts that are already in place (for RNG Pipeline Injection, RNG Sale, NGas Purchases, RIN-Production Registration with EPA, and RIN Verification Services) and WSSC's plans for the few remaining transactions. The system is scheduled for start-up in late summer of 2023. Of additional interest: handling the RIN sales and other contracting processes in house requires no additional personnel and can be done with existing staff.

Learning Objectives:
Understand contracting needs with various parties required to self-implement an RNG/RIN program
It only takes one engaged/interested engineer (advocate) to develop and manage the program
Where/when needed: un-attractive O&M or other activities can be individually outsourced; and expert advice can be contracted

Biographies:
John Willis is a VP with Brown and Caldwell and WEF Fellow with 32 years creatively attacking waste of energy and un-recovered resources within the wastewater space. He passionately explores, solves, and elevates poorly understood opportunities within the sector. He recently Chaired WEF's Biosolids Committee and Vice-Chaired WEF's PFAS Task Force, completed 5 years of service on WRF's Research Advisory Council, and now Chairs WEF's new Energy Management Task Force.

Robert Taylor P.E., C.E.M. has been the Energy Manager for WSSC Water (WSSC) since 2000. Mr. Taylor is responsible for managing a $22 million annual energy budget by optimizing supply and demand side energy optimization strategies, including upgrading inefficient equipment, load shifting, distributed generation, and financial hedging in a real-time wholesale electricity market. Mr. Taylor is the author of numerous energy papers in the field of energy management and has been awarded several awards from the Association of Energy Engineers including Energy Engineer of the Year, Corporate Energy Manager of the Year, and Environmental Project of the Year, as well as EPA's Climate Change Leadership Award and

WSSC's General Manager Award. He holds a B.S. in Civil Engineering from Lehigh University and an M.B.A. from the University of Connecticut. He is a Registered Professional Engineer in Maryland, and a Certified Energy Manager (CEM).

123. Friday, September 1, 2023
Room 215
11:15 AM - 11:45 AM

Title: Side stream nitrogen removal – How have common processes actually performed at WRRFs?

Presenter:
Anton Dapcic
Process Engineer / Wastewater Carbon and Energy Management Lead, Carollo Engineers

Abstract:
Side stream treatment (SST) processes have become an important process addition for BNR facilities that produce nitrogen rich recycle streams from dewatering post anaerobic digestion. Utilities have a choice of several process alternatives that are by now established in the U.S. Often, comparative pros and cons are primarily based on theoretical, ideal process stoichiometry to predict process performance, energy consumption, carbon demand, and alkalinity consumption. This study set out to compare common SST based on actual long-term field data from BNR facilities to evaluate actual performance differences of these systems as designed and operated in facilities. Full-scale performance data is compared from five prevalent sidestream nitrogen removal technologies in the United States to compare long-term process performance, reliability, alkalinity consumption, aeration and overall energy demand: Conventional nitrification/denitrification (NDN), ANITA™Mox (Veolia), DEMON® (World Water Works), ANAMMOX® (PAQUES), and DigestivorPAD™ (Ovivo). The analysis was performed based on meta-data from processes and design of 12 facilities in North America. This results allow a comparison of theoretical and actual technology differences. The aim is to provide municipalities, designers, and system providers with awareness of process specifics when selecting, designing, and operating side stream treatment nitrogen removal processes, rather than relying mainly on theoretical process predictions of performance, process stoichiometry, and energy efficiency.

Learning Objectives:

Biography:
Anton Dapcic is a Senior Technologist at Carollo Engineers with 10 years of wastewater process evaluation, design, and process optimization experience in the field of water resource recovery facility design and analysis, secondary treatment modeling, and biosolids treatment and management. He serves as the Innovation Lead for wastewater carbon and energy management at Carollo Engineers.